Pixon®60

A TouchChatHD App Clinical Manual

The Pixon®60 App Clinical Manual

February 2014

Author and App Developer: Gail M. Van Tatenhove

Gail M. Van Tatenhove
407-876-3423
gvantatenhove@cfl.rr.com
www.vantatenhove.com

Table of Contents

The Story Behind the App

Welcome to the Pixon®60 App! Let me tell you the story behind this app.

> *Once upon a time (2008) in a land far far away (Australia), there was a group of young maidens (speech-language pathologists) who asked a wise man (Bruce Baker) if he could help them in their work with the children of the land who had difficulty speaking. They wanted to be able to give all their children a simple way to communicate. This wise man asked an old woman in the kingdom (Gail Van Tatenhove) to accept this challenge. She and a team of the wisest women and men of the kingdom worked and worked and worked for over a year to make just what the maidens wanted. They drew pictures, made communication boards, designed wall charts and developed all sorts of other things. Then they put everything in a bright yellow box (The Pixon Project Kit) and told the maidens to use the things in the yellow box to help all the children in the land. And the children used all the things in the yellow box to talk and talk and talk. And it was so wonderful that the yellow box is now used with children everywhere around the whole world. And the people rejoiced! The end.*

In 2009, Semantic Compaction Systems introduced the Pixon® Project Kit. This Kit provides teams with a resource for working with children who would benefit from use of simple, manual communication boards before using speech generating devices or apps. The Kit includes 10 pre-made manual communication boards of various sizes, a language curriculum and a variety of educational and environmental visual support materials. The purpose of the Pixon Project Kit is to develop communication, vocabulary and language skills using a simple, low-tech AAC system. Using the Pixon Project Kit support transitions to a more sophisticated AAC system, specifically a speech-generating device.

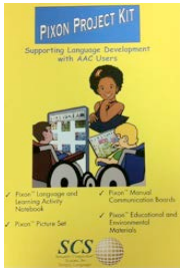


Figure 1: Pixon Project Kit

The most frequently used manual communication board in the Pixon Project Kit is the 50-location board - a simple, single-sheet display of 50 +/- core words, plus a flip section at the top with supplemental core words (e.g., polite words) and extended vocabulary that is activity-specific.

Figure 2: 50-Location Board

Due to the success of the Pixon Project Kit, the Pixon60 app was developed.

The idea of an app based on the 50-location Pixon manual communication board was requested by parents, teachers and speech-language pathologists (SLPs). They wanted an app that had the ***same simplicity*** as the 50-location manual

communication board from the Pixon Project Kit, with the additional communicative power of speech output. They wanted their children to have the option of communicating with a manual communication board and a speech-generating app. So, in 2013, work began on the Pixon60 app.

This manual provides basic information about the structure of the Pixon60 app, clinical questions and answers, intervention principles and language lessons. This manual DOES NOT include any operational guidelines on use of the TouchChatHD app. Refer to www.touchchatapp.com for more information about programming vocabulary, creating pages, editing pages, or adjusting any of the settings in the app.

Exploring the App

The best way to learn about the structure of the Pixon60 app is to start exploring it.

The opening "home" page of the app is shown below. The name of this page is CORE.

Row 1
Row 2
Row 3
Row 4
Row 5
Row 6
Row 7
Row 8

Figure 3: CORE Page

Row 1 = This row has activity keys that navigate to a page of activity-specific vocabulary, with the core vocabulary and activity keys repeated on each page. Using the MORE key at the end of this row, you can navigate to a page that allows you see create additional activities (see Figure 4). The specific pages of the new activities are named "extra activity # - core" and you add the activity vocabulary in row two and retain access to the core vocabulary.

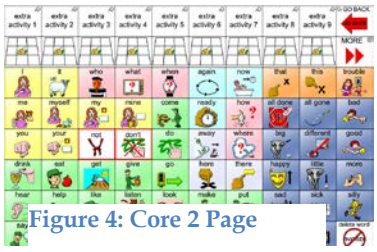


Figure 4: Core 2 Page

Row 2 = This is the row where activity-specific vocabulary appears on any of the pages. Figure 5 shows the BODY activity. The remaining rows are the same so the person has access to the pre-stored core vocabulary words. Using the MORE key navigates to a page with more body part words, plus empty spaces to add more vocabulary. There are NO CORE words on this page (see Figure 6).

Figure 5: Body - core Page

IMPORTANT NOTE: When editing the CORE page, program additional core words into row 2. There is a prompt that says "add a core or personal word." The team developing this app recommends the following words in the following order because of their frequency of use with their children using the app: the person's name, mom, dad, is, in, out, on, off things. Use the color code shown below. These words need to be programmed on the MORE CORE page.

Figure 6: More Body Page

Color Code:
yellow = pronouns/people
pale green = verbs
lavender = prepositions
light orange = nouns
red outline = negation
skyblue = adverbs
pink = interrogatives/question words
pale blue = adjectives

Rows 3 – 8 = These are the rows for the core vocabulary. This core vocabulary is consistent across pages and needs to stay consistent across the pages any additional pages created using the current architecture.

Exploration Activity 1: Simple Exploration of Core Words

1. Start with a clear display by pressing and holding the black X arrow in the text window.
2. Explore the core words, building simple phrases and telegraphic sentences.
3. Use DELETE WORD to correct and alter messages.
4. Select the text window to speak the message.

Exploration Activity 2: Simple Exploration of Activity Words

1. Select the activity called POLITE. In doing this, you actually navigated to a new page called Polite-core because you have access to words for being polite while still having access to your main core words.
2. Say each of the words from this activity in row 2.
3. Select MORE from the end of row 2. In doing this, you have navigated to a page called "more polite." This page allows you to add more vocabulary for interacting with others politely.
4. Select BACK to return to the Core page.
5. Repeat this exploration for all of the activities represented in row 1. Pay extra attention to how to get access to letters and numbers.
6. Select the MORE key from the end of row 1. This row is pre-developed to allow you to develop and program vocabulary for nin3 additional activities.

Exploration Activity 3: Getting More Core

1. More core vocabulary can be accessed by selecting the MORE key on the end of row 2. This navigates to a page called “More Core.”
2. Select and program additional core vocabulary on this page. The words from the Core page in row 2 need to be repeated on this page for consistency in location.
3. Refer to TouchChatHD operational information to directions for programming vocabulary.

Exploration Activity 4: Talking and Modeling

1. Spend time talking with the Pixon60 app in order to become comfortable talking with the app and providing ALgS (or modeling) with the app.
2. Say these sentences. Speak the sentence by selecting the text window. Then clear the sentence before starting the next one. If you want punctuation and capitalization, go to the abc/123 page. All functions and programming for handling text are on this page.
    a. I want more.
    b. I don’t want that.
    c. Give me more please.
    d. I want yellow.
    e. Today is Monday.
    f. It hot, not cold.
    g. Put away my headphones.
    h. Where my book?
    i. Put spoon here.
    j. I like your hair.

Development Questions and Answers

Children successfully communicating using the 50-location Pixon board were introduced to the Pixon60 app in classroom and home settings. To meet standards of evidence-based practice, the following questions were asked during development of the Pixon60 app.

1. How satisfied are you with the use of a manual communication board with your child/student? What do you hope to gain in the use of an AAC vocabulary app?
    a. The vast majority of teachers, speech-language pathologists (SLPs) and parents were very satisfied with use of the Pixon 50-location manual communication board. They indicated that it provided their children with the words they needed to control their worlds with words instead of behaviors. While the manual communication board didn't have a huge amount of vocabulary, it had the right words. Plus, the manual communication board was easy and convenient to use (e.g., lightweight, non-breakable, easily replaceable, easily customizable), non-intimidating to a variety of communication partners and practical in the classroom and at home.
    b. The parents hoped their children would become more independent in their communication, including the ability to talk to friends and family without the communication partner being right next to them. They hoped it would encourage more communication initiation and interaction because of the speech output.
    c. Teachers hoped similar things as the parents, but were particularly focused on hopes of more peer-to-peer interaction. SLPs hoped for improvements in generative language output because children could hear themselves building a simple phrase or sentence.
2. What do you think could be a downfall in the use of an app vs. a manual communication board? What are you afraid of?
    a. The parents were clearly afraid of potential damage to the mobile technology and the costs involved. They were never afraid that their children might stop talking because they had all already seen the exact opposite with the use of the 50-location Pixon manual communication board.
    b. Teachers and SLPs were concerned that there might be too much "stuff" to have to manage. Plus, they expressed concern about learning the operational and programming features of the app. Some were quite intimidated by the use of technology.
3. How much more sophisticated should the app be compared to the manual communication board?

a. The overwhelming majority of parents, teachers and SLPs using Pixon 50-location manual communication boards said the same thing: DON'T MAKE THE APP DIFFERENT FROM THE MANUAL COMMUNICATION BOARD. Keep it the same. Keep it simple.

b. SLPs requested that the app include only the operational features that were necessary for the production of simple language. They specifically said "give us access to words and don't waste space on the display with device operations." They clearly wanted the "real estate" on the app to be used for language. As a result of this input, the Pixon60 app has only one function (i.e., DELETE WORD) on the core pages.

4. How did the children communicate when given access to both their Pixon 50-location manual communication board and a mobile device with the Pixon60 app?

   a. In the first introduction of the Pixon60 app, the children were curious and explored the app. Surprised and happy faces were the norm.

   b. Language samples were compared on all the children. Their mean length of utterance in words (MLU-W) was nearly identical in the use of their Pixon 50-location manual communication boards and the Pixon60 app. For many of the children, the MLU-W was slightly higher when using the app.

   c. Over time (e.g., 3 to 6 months), about half of the children started producing more syntactically correct phrases, initially with the app only and then both on the app and the manual communication board. It was theorized that hearing the phrase spoken (e.g., come here, go away, get that, big trouble) was helping them develop an inner voice for the language. Previously, a child might say a string of words (e.g., silly, look, that) on his/her manual communication board and the teacher/parent would interpret and say the sentence (e.g., that looks silly). Now children were putting words in a syntactically logical order (e.g., that look silly) and the teacher would expand it verbally with additional morphology and/or words (e.g., yes, that looks silly to me too.)

5. When did the children choose to use the manual communication board vs. the app?

   a. The children went back-and-forth between the app and the manual communication board. In classrooms, they initially used the manual communication board over the app because it was part of their routine. During "messy" activities (e.g., water table, finger painting, lunch), they continued to use their manual communication boards rather than their mobile devices.

   b. Ambulatory children choose to use their manual communication boards when physically active (e.g., on the playground, in PE).

   c. Children in wheelchairs doing direct selection with their hands used both systems interchangeable, depending on the positioning of the manual communication board vs. the mounting of the mobile device. The two systems had a "shared access space" and couldn't generally be used simultaneously. For

some of the children, they preferred the manual communication board because of the larger size of the targets (1.5 inches on the manual communication board vs. ¾ inch on the iPad).

d. None of the children in the beta-test of the Pixon60 app used scanning, partner assisted scanning or eye gaze. There were 2 adults using Pixon eye gaze boards who used eye gaze paired with partner assisted scanning (PAS). Their use of the Pixon60 app was limited. When given a choice, the preferred their eye-gaze/PAS system over the app because of the faster rate of access using eye gaze rather than single-switch scanning. Plus they both had more vocabulary on the eye gaze boards than was available on the Pixon60 app. They choose speed and vocabulary over technology.

6. How did the children adjust to the minor vocabulary differences between the manual communication board and the app?

   a. On the manual communication board, some pictures have two words printed above the picture (e.g., my-mine). This is an acceptable clinical practice when using a manual communication board because the communication partner assumes the role of interpreting which of the words is appropriate in the linguistic context (my/mine + book = my book, that my/mine = that is mine.) On a speech generating system, having two words spoken (e.g., my mine) when a picture is selected is not acceptable. Therefore, each of these words needed a key on the app. The words were located horizontally side-by-side. Children had no problems making this adjustment.

   b. On the manual communication board, the core words are generally arranged in word groups in alphabetical order. This is the same on the app, but due to the difference in the number of locations (i.e., 50 vs. 60), there is a slight difference in the exact placement of the words on the manual communication board vs. the app. Children managed this change easily.

   c. There are a few differences in the words available between the manual communication board and the app.

      i. The manual communication board has four words that are not in the app: does, did, finished and gone. On the manual communication board, there is a picture of a stop sign with the words “all done” and “finished” written above. On the app, the picture of the stop sign is in the same location and says, “all done.” The app does not have the word “finished.” It was omitted because is was deemed as having the same semantic meaning and pragmatic function as “all done.” The same thing was done with “all gone-gone” and “gone” was omitted. The picture on the manual communication board for “do” has “do-does-did” written above it. On the app, only “do” is available because morphological variations are not provided for any other verbs. The children coped with these changes without a single noticeable hiccup.

ii. The app has two words not in the manual communication board: work, tired. Children quickly learned these additional words.

d. The app has one row (the second row) that is set aside for programming of frequently needed core word or personal core words. The manual communication board does not have this feature. In the Pixon60 app, this row navigates to a page where additional core words or personal core words are added. Students learned these new words easily and used them often, based on what the teams decided to program in the row. NOTE: It was generally agreed upon that if a child needed more vocabulary, the team would consider a more robust AAC system that uses similar pictures (e.g., the Unity program in a dedicated device or LAMP Words for Life in a mobile device).

7. How did the slight difference in vocabulary location influence the children's previously developed motor plan for language production using the manual communication board?

   a. No child had any noticeable challenges in the slight adjustment in their motor plan because every effort was made to maintain a relatively similar configuration in accessing the core vocabulary. They adjusted because they were not just selecting keys by location. They were also visually attending as well as learning the meaning of the pictures. Their selection of vocabulary used motor, visual and cognitive processes.

   b. Some minor adjustments were needed for accessing the extended vocabulary because some of the categories of words (e.g., colors, art, time, weather, alphabet) are combined in the Pixon 60 app. However, the ease of access to these words on a single page quickly compensated for the motor difference in accessing these words.

8. How were the children able to navigate through the app to locate extended vocabulary words?

   a. Learning to navigate through the extended vocabulary was the biggest challenging in learning to communicate with the app vs. the manual communication board. The children had some adjustments to make when using the page dedicated to the activity vocabulary because after a single selection, the Pixon60 app navigates back to a core page. This had to be altered for some of the children so that they had to intentionally navigate back to a core page.

   b. All extended vocabulary is provided on the Pixon 50-location manual communication board in a flip section located above the core vocabulary. The students had something tangible to feel and move. Plus, the thickness of the flip section provided visual evidence that the vocabulary was there for them to access, even when they weren't looking at a specific set of words. Plus, they had tactile, kinesthetic and visual input to learn how to navigate through this vocabulary. Many were observed to find a word in the extended vocabulary on their manual communication board, keep a finger there and use the other hand

to flip and find another word. Communicating in a tangible paper medium allowed this to happen. In teaching navigation through the extended vocabulary in the app, the team simulated the use of the manual communication board to help the students conceptualize how the pages were changing.

c. Students who could navigate independently on their manual communication boards learned to navigate on the app. Students who were dependent on others to do the navigation on the manual communication board learned to be more independent in the app because the physical manipulation of the hard-copy paper rows was eliminated.

d. A common complaint of teachers and parents was that the children seemed to "play" more with the app rather than purposefully communicate. This was never an issue with the Pixon 50-location manual communication boards. The attraction of the dynamic displays needed to be monitored in order to redirect the children's attention to the communication task.

9. How did interaction differ peer-to-peer and adult-to-child?

   a. Use of the app increased peer-to-peer interaction because of the speech output. Communication initiations, when done with a manual communication board, often went unnoticed. However, when using the app, the communication partner response rate of peers significantly increased.

   b. Adult to child interact remained relatively stable.

10. How did the teachers and parents provide aided language stimulation (ALgS) using the app vs. the manual communication board?

    a. The use of ALgS was standard practice among the teachers and parents using the 50-location Pixon manual communication board. They need only minor training on the Pixon60 app in order to feel comfortable continuing to provide AlgS.

    b. When sitting side-by-side providing ALgS, there was not a significant difference between use of the manual communication board vs. the app. However, when sitting across from the child, teachers and parents reported that is was much easier to provide ALgS on the manual communication board.

11. How did using the manual communication board vs. the app influence participation in the classroom?

    a. Parents and teachers reported little change in the classroom between use of the manual communication board vs. the app because of the consistency in the vocabulary. Their children were able to participate in classroom activities as long as those activities focused on core vocabulary rather than infrequently used extended vocabulary that was not provided on the manual communication board or in the app.

    b. The only difference reported by teachers in the classroom was that their students using the app were interrupting others and talking out of turn. They

might have been doing the same thing with their manual communication boards, but because there was no voice output, it wasn't deemed disruptive in the classroom. Teachers said they had to initiate more "rules" for when it was a student's time to talk.

12. What visual support materials did you need in order to support language development and use of the app?

    a. The Pixon Project Kit includes a wall chart that has remove-able picture cards that are used to supplement the words on the Pixon 50-location manual communication board. Use of these supplemental core words allows teachers to introduce more vocabulary, with the goal of growing the student's AAC vocabulary. The teachers continued to use the wall chart with the app.

Figure 7: Pixon Project Kit Wall Chart

    b. The picture cards from the wall chart were used for two purposes: to provide access to additional vocabulary during classroom activities and to support sentence building. SLPs primarily did the sentence building activities. They would remove target word cards from the wall chart, selecting only those words available in the app (I, want, go, get, there, that). The cards would be laid out into simple phrases to encourage the practicing of different syntactical constructions (e.g., subject-verb, verb-location).

13. What are the recommendations of the supporting teams following use of the Pixon60 app with children who have previously been successful communicators with the Pixon 50-location manual communication board?

    a. The teams recommended that the app be used in conjunction with the Pixon 50-location communication board in order to provide the student with a consistent system that can be used in any place or environment (e.g., at the beach, in the tub, etc.). Plus, having the Pixon 50-location manual communication board is a necessary back-up system to the app.

    b. The teams recommended that the curriculum and visual support materials from the Pixon Project Kit be used with children using the app. They could not imagine providing access to the curriculum without use of the wall chart from the Pixon Project Kit.

    c. Most teams and parents recommended adding the following core words into row 2: the person's name, mom, dad, is, in, out, on, off, thing. They recommended adding other core words to the More Core page, maintaining the left-to-right organization of the vocabulary and the color code from the Core page.

d. There is lots of space in the app to program in more words. The teams recommended that, if you find yourself doing a lot of programming of more core words (beyond the additional page), then it might be time to consider using an app or a dedicated device that already has all those core words programmed.

e. This Pixon60 app does not provide morphological variation for nouns, verbs, or adjectives. The teams recommended use of an app or dedicated device if morphological variations were needed for the child's continued language development.

14. How has using the Pixon60 app influenced your decision to transition to a more robust device or a different app?

    a. One teacher wrote the following: "Using the Pixon 50-location manual communication boards showed us that our students had the potential to learn how to communicate with core vocabulary. We used that evidence to support our request for the funding of speech output technology. Now I'm sure we'll use the information about how they are communicating with the app that they are using in the classroom in all of our funding packets for the purchase of either dedicated speech-generating devices or an iPad with Pixon60."

    b. A parent wrote the following: "My son did really well with the Pixon 50-location manual communication board and then the Pixon60 app in an iPad. We think he as outgrown it (the app) because he needs more core words and word endings. So, we are doing device trials with an Accent 1200 with Unity 84 and also with LAMP Words for Life in an iPad. I wouldn't have thought it was possible before because those systems looked so hard to me. But using the Pixon 50-location manual communication board and the Pixon60 app, my son has shown us that he has language in him and we need to get it out!

Manual Disclaimer

The remainder of this Pixon60 manual is a highly modified adaptation of the Pixon Language and Learning Activity Notebook (PLLAN) from the Pixon Project Kit. For original material, please refer to the PLLAN from the Pixon Project Kit.

General Intervention Principles

Some teachers or SLPs using the Pixon60 app will have many years of experience working with children and adults using augmentative and alternative communication (AAC) strategies. Other teachers or SLPs will be beginners in the field of AAC. For those beginning their AAC journey, the following simple intervention principles will point you in the right direction. For seasoned veterans, they are a good refresher course on best practices in AAC.

Readiness to Learn

Many children and adults who use AAC systems have a range of other neurological, sensory and physical challenges. It is beyond the scope of this author to address the full range of characteristics of individuals who might be using the Pixon60 app. However, it is recognized the people must be "ready to learn" before learning can occur. Readiness to learn includes the following points:

- Sensory Integration: Some children and adults who use AAC will have been identified as having "sensory integration" problems. These individuals often need to have sensory activities completed prior to attempting to engage in other learning activities. AAC intervention should coordinate with any sensory integration intervention that is occurring.
- Visual and Hearing: Vision and hearing challenges are often present in children and adults who use AAC. This manual is not intended to address specifically the instruction of children with recognized single or dual sensory impairments. Intervention teams will need to adjust activities to support individuals with vision or hearing impairments.
- Positioning: Many children and adults who use AAC have significant physical challenges and require consideration of their physical positioning in relation to their readiness to learn. The person should be properly positioned in a chair, wheelchair or other type of support system so that he/she can adequately see and access the learning materials provided.

Fun and Functional

Teaching children and adults with disabilities how to communicate should be fun for both the teacher and the child or adult with disabilities. Communication is not something that you can force a person do; rather, it is something people do because it serves a purpose or function. In this context, functional does not mean that it allows someone to communicate only those things related to basic human needs. Rather, communication that is "functional" means it helps the person achieve his/her own purpose or function, which could be to (1) connect with other people by making a joke, (2) get something you want, (3) avoid something negative or (4) express an opinion.

Fun and functional intervention usually results in learning.

Person-Directed

One way to make learning fun and functional is to give the child or adult opportunity to feel in control of the learning activity. This approach is referred to as “person-directed” intervention. Person-directed intervention helps build a sense of personal power and control critical to becoming an independent, internally motivated communicator. This includes the power to:

- control what and when activities occur;
- control the pace of an activity;
- express both positive and negative opinions;
- question others and build personal curiosity by asking questions; and
- evaluate yourself and others.

When the child or adult with disabilities has control over an activity, then that person is more motivated and more likely to put forth the effort needed to learn something new and potentially difficult and/or stressful. Person-directed intervention encourages the child or adult with disabilities to assume responsibility and decide how learning is going to occur. This type of active participation is important to reduce or prevent “learned helplessness” and to help the child or adult see him/herself in relationship to others, including learning that his/her opinions and ideas are respected and valued.

Person-directed intervention does not imply that the teacher has no goals or lesson plans. Good teaching is a constant shifting between being prepared with a lesson, goals and the necessary materials, while being able to “go with the flow” when the child or adult is completely interested in something else that day or in taking the lesson in new, unplanned directions. The following points are generally accepted tenets of person-directed teaching.

- Follow the person’s lead: Watch for what interests the individual and use those interests to create meaningful learning experiences.
- Build on the person’s interests: Once you know what interests the person, build on those interests and find ways to expand the child's or adult’s communication. For example, the child might have been interested in swinging. You join in the swinging by pushing him/her after he/she asked for "more" with his/her Pixon manual communication board.
- Carefully use barriers: The use of barriers can be an effective way to help the child or adult use communication to solve problems. Barriers could involve "gentle obstruction" when you block his/her way or put something in the way of whatever it is he/she wants. It could also involve intentionally acting stupid or doing something the wrong way so that he/she has to correct it.

- Be surprising and novel: When engaged with the individual, do something surprising and novel. The person may be more compelled to engage in learning because you are not acting in normal ways. Think about what you tend to do over and over and do it differently once in a while.
- React naturally: The activities and words used in the intervention should result in natural consequences. If the person says, "stop," then stop. Modeling with natural consequences might require the support from at least two instructors. One instructor works directly with the person using the app, providing the model to the person along with any necessary hand-over-hand assistance (e.g., to say the word "stop" to make someone stop doing something). The second person is the "reactor" and responds to the person's communication (e.g., stops his/her activity).
- Be honest about the person's communication attempts: Many children and adults who are learning to use an AAC system will have a range of multi-modal communication strategies which they have used with varying degrees of success. Most individuals using AAC strategies also communicate with vocalizations, gestures and facial expressions. Acknowledge the person's use of these strategies (e.g., I hear you using your voice, so I know you are talking to me), but also tell him/her what is and is not being understood (e.g., I hear you using your voice, so I know you are talking to me, but I don't know what you are saying) and then direct him/her to use the AAC system because of the power it gives him/her (e.g., I hear you using your voice, so I know you are talking to me, but I don't know what you are saying. Use the words on your board so ANYONE can understand what you are saying and you can get what you want).

Model Language

When interacting with a child or adult with disabilities who is using an AAC system, verbal and visual language models are critical for language and AAC learning.

- Provide short, but complete verbal models. Speak to the child or adult with disabilities with short, but complete sentences.
- Provide ALgS. ALgS (ALgS) is a strategy whereby the communication partner talks TO the child or adult by using the person's AAC system. This strategy has been shown to help in picture comprehension/expression and learning simple language structure.
- Use ALgS to prompt expressive language output. Talking with someone using a Pixon60 app is a natural strategy for prompting them to talk back with the app. For example, if you are drinking juice and the person's juice is "all gone," you verbally say, "Your drink is all gone. Maybe you want more to drink." While speaking, point to/speak these pictures on the Pixon60 app: "drink" "all gone" "want" "more" "drink."
- Respond and keep responding. No matter what the child selects on the Pixon60 app, the rule for communication partners is: RESPOND, RESPOND and RESPOND.

Provide natural consequences to whatever the person said, even if it seems like a mistake. If the child or adult meant to say "drink," but instead said, "eat" and there is no food available, then pretend to “eat” the juice, trying to chew on the glass or straw. Be animated and fun. Then say, “I can not eat this. I have to drink it” and use ALgS to say “not” “eat” “drink” “this.” Or, if acting silly in this way does not suit the situation, say, “you said eat, but we are not eating. We are drinking this.” Use ALgS to say “not” “eat” “drink” “this.”

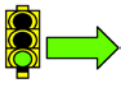
- Expand the language. After the person communicates something, expand upon it. For example, if the child says “more” as a request for more juice, using their Pixon60 app, you verbally say “You want more to drink” while using the app to say “want” “more” or “more” “drink.”
- Model ALgS incrementally. When using ALgS, model the type of language you hope the child or adult will produce. Determine the person’s current expressive language abilities and model 1 or 2 words beyond that level. Keep trying to move the person one step forward in the amount and kind of language he/she can produce independently.

Context to De-Contextualization

One of the great wonders of language is that a word can be used in multiple contexts with a variety of meanings. A simple word like “go” can mean many things. When a normally developing child is learning words, he/she learns that word in a single context. “Go” might mean he/she is going to be placed in a stroller and “go.” New experiences teach the child that “go” also means to be pushed in a swing, that daddy will “go” to work and be “gone” all day, that you “go” when you get in your car seat, or you learn “to go” on the potty.

The multiple meanings of the word “go” are a wonderful and efficient thing, but it is also a challenge when trying to represent the word “go” with a picture on a communication board. Which meaning do you draw? How many pictures do you use on the AAC system for the word? How much “real estate” can you afford to use on your board for 1 word with many meanings?

When developing an AAC system, whether a picture communication board, a speech generating device or an app, one picture needs to be used consistently to represent a word, regardless of how the meanings of that word varies. One picture is used to represent a word and that picture, regardless of the variations of meaning of that word, must cover all the uses of that word. For example, with Pixons, the picture for “go” is a traffic signal with a green arrow. The metaphor or story for this picture involves the idea of “going” when the light turns green. The green arrow is added for the idea of moving forward in space. This picture is used for all the meanings of the word “go.”



Some children and adults with disabilities have rich life experiences and good language understanding. They are able to understand the metaphor of the pictures with

explanations. However, other children and adults with severe language disabilities and limited life experiences need to be shown how to use the Pixons, which involves teaching the location of the Pixon on the board/row/page and teaching them to use the Pixons across a range of contexts.

- Use motor skills to learn the location and language: Children and adults with severe language and cognitive disabilities DO NOT have to be able to identify Pixons by label in order to use them to communicate. In fact, many children and adults with severe disabilities are functionally using Pixons without being able to identify them by label. They have learned to use them meaningfully because they have learned a motor pattern for talking. By using the Pixon 50-location manual communication board (or the Pixon60 app) over and over, their bodies have learned where different Pixons are located on their communication display (motor pattern) and they select them quickly and accurately without much thought about what each individual metaphor means or where it's located (motor automaticity). The two keys to learning building motor automaticity are REPETITION and CONSISTENT LOCATION of the Pixon. The Pixon stays in the same place on the Pixon 50-location manual communication board and across pages in the Pixon60 app.
- Teach language and pictures in context: As part of teaching the metaphor behind the Pixon, initially teach the word and picture in the context shown in the picture. Re-enact the story behind the Pixon in order to help build life experience, language understanding and picture association.
- Use supportive visual props: Make visual props based on the Pixon pictures and use them to help teach the ideas behind the Pixons. For example, you can make a "traffic light" without the "green" light. Then make a green "dot" that can be attached to the light. Whenever the child attaches the green dot to the traffic light, he/she can "go" or something/someone else can "go."
- Expand contexts: Language learning is a continual process of de-contextualization. That means that the child or adult knows what words mean when different people use them in different contexts. Rather than doing the same activity over and over, there needs to be a conscious effort to build flexibility in language meaning to prevent the child or adult with disabilities from thinking that a word can only be used in a specific setting to mean just one thing. Involve a range of communication partners (parents, friends, siblings, aides) and a variety of settings (home, school, outside) to support the de-contextualization process.

Measure and Document Outcomes

Evidence-based practice is an important issue in the field of AAC. Teachers and SLPs need to be collecting, measuring and analyzing the communication performance of the children and adults whom they support. There are tools available, related specifically to the field of AAC, which can help teams evaluate the progress of the individuals they

support. Appendix A provides simple checklists for documenting progress in the use of communication functions, vocabulary acquisition and simple syntax and morphology.

One of the most effective strategies to measure and document outcomes is to collect language samples. Taking language samples is a well-established method used by SLPs to measure vocabulary and language output. It is beyond the scope of this manual to describe the process for collecting and analyzing a language sample. However, the following recommendations are made in regards to measuring and documenting outcomes:

1. Every 2 to 3 months, collect a language sample. Videotape several sessions, across different activities and communication partners to obtain a balanced picture of the person's abilities. Use the checklists from Appendix A to document the person's progress.
2. Collect information on these objective and subjective areas of language development.
    - Semantics
        - How many words are currently available on the person's personal AAC system?
        - What is the person's current expressive vocabulary?
        - What new words is he/she using that he/she wasn't using before?
    - Pragmatics
        - Why is he/she communicating? What is the range of communication functions being produced?
        - How is he/she more in control of his/her own choices and environment?
    - Syntax & Morphology
        - What is the average length of utterance that the person is producing?
        - What is the length of utterances based on words and morphemes?
    - Social/Environmental factors
        - Who are the person's communicator partners? Is he/she communicating independently with more people?
        - What is the effect of the use of ALgS? Does the person communicate more and better with people who use ALgS than with partners who do not use it?
        - How are important communication partners viewing the person's progress?

Language Goals and Instructional Strategies

The core vocabulary of the Pixon60 app has been divided into 12 units, with an emphasis on various pragmatic functions in the development of communication skills. Each unit lists a long-term goal, target vocabulary and specific objectives and instructional strategies. Some of the units also include recommendations for personalization or customization of the vocabulary that would fit within that unit.

The units are NOT a sequential or linear series of lessons. The units were developed simply as a strategy for organizing and documenting instruction. It is recommended that the words from Unit 1 be included in the person's initial instruction with the Pixon60 app. However, after that, the remaining 11 units can and should be taught in any order necessary. It is the philosophy of the Pixon Project and the Pixon60 app development teams that it is essential to "teach all the words all the time, but not all at the same time." That means you might do an instructional activity that includes a couple of words from several units, then in another activity you focus on words from different units.

Pixon®60 Core Vocabulary from the CORE Page

1. again
2. all done
3. all gone
4. away
5. bad
6. big
7. come
8. different
9. do
10. don't
11. drink
12. eat
13. get
14. give
15. go
16. good
17. happy
18. hear
19. help
20. here
21. how
22. I
23. it
24. like
25. listen
26. little
27. look
28. make
29. me
30. mine
31. more
32. my
33. myself
34. not
35. now
36. put
37. ready
38. sad
39. say
40. see
41. sick
42. silly
43. stop
44. take
45. tell
46. that
47. there
48. this
49. tired
50. trouble
51. turn
52. want
53. what
54. when
55. where
56. who
57. work
58. you
59. your

There are no units for the supplemental or extended vocabulary. It is the responsibility of intervention teams to include those words in their instructional plans.

Unit 1: Mediation

Long-Term Goal: NAME will direct others and the course of any activity with words instead of behavior.

Target Vocabulary**:** 10 core words

1. again
2. all done
3. all gone
4. different
5. do
6. help
7. look
8. more
9. stop
10. what

Specific Objectives:

1. NAME will request a repetition of an activity or an aspect of the activity using the word “again” or “more.” (function = request recurrence)
2. NAME will providing information about completion of an activity using the word “all done.” (function = cessation)
3. NAME will say “all gone” to show that he/she recognizes that something is missing or depleted. (function = disappearance, nonexistence)
4. NAME will request a change in activity, using the word “different.” (function = request action, directive, comment)
5. NAME will direct actions in the activity using a word, such as “do.” (function = direct or state action)
6. NAME will ask for “help” when he/she is unable to do something independently before or during the activity. (function = request assistance)
7. NAME will call attention to something that is out of the ordinary using a word, such as “look.” (function = existence, request action, direct attention)
8. NAME will request an additional amount of something or repetition of an activity or an aspect of the activity using the word “more.” (function = request recurrence)
9. NAME will request the stopping/disapproval of an activity or action using the word “stop.” (function = cessation, rejection)
10. NAME will ask “what” when he/she doesn’t know about an object or activity. (function = request information)

Instructional Strategies:

1. Nearly any activity can be a starting point for teaching functional use of these words in a meaningful context. The following routine is an example of how all ten words could be used in one activity. Vary your activities to encourage use of these

words across a range of contexts. Favorite activities might include the following: stories, music, art, cooking, or dress-up.

a. Provide the materials of the activity to the person in such as way that he/she doesn't know what the activity is all about (e.g., put them in a container, bag, etc.). Model and prompt the word "what."

b. Give the person the container or bag in which the objects of the activity are located, but fix things so that the person cannot independently open the bag or container. Prompt the word "help." Throughout the activity, find other opportunities to use obstacles and barriers to prevent the person from independently being able to manipulate the materials. Model and prompt the word "help."

c. Once the bag or container is opened, arrange materials in such a way that the person needs to ask to "look" at them. You can also do an activity, such as book reading, reviewing greeting cards, or playing an app that would naturally encourage the use of the word "look."

d. Design the activity so that there are different things that you need to "do" to complete the activity. For example, if mailing a greeting card to a friend, you need to sign it, seal it, address it, stamp it and mail it. For each of those actions, the person says "do" to do the next step in the series of actions. He/she might also use "do" to indicate that he/she wants to do it independently. In that context, model use of "I do" or "do myself."

e. Engineer the activity to have some items that might be depleted, such as an empty jelly jar when making PBJ sandwiches or a dried up glue stick when doing an art project. Encourage the use of the word "all gone" to comment or give information. This can directly lead into asking for "more."

f. During the activity, use moderation with the materials, encouraging the person to ask for "more" of something. Model and prompt the word "more."

g. For activities that involve multiple steps, encourage use of "all done" to communicate that the person is finish with that step of the activity. For example, during an art project, saying "all done" when coloring with one color might indicate a need for a "different" color or for using another type of art material (e.g., glitter). "All gone" can also signal a request to end the activity.

h. When the activity is finished, determine whether you are going to do exactly the same activity (e.g., read the same book) or something different (e.g., different book, different activity). Model and prompt the words "again" to do the same thing again or "different" to do something differently or a different activity.

i. At any point in the activity, the student has the option of asking to "stop" or be "all done" if he/she is bored, irritated or ready to be left alone. Model and prompt the word "stop" or "all done" to signal the completion of an activity.

2. In order to maximize use of these words, use principles of motor learning, motor patterns and development of motor automaticity. Balance teaching by picture **location** with teaching by picture **meaning**. For many children and adults with severe disabilities, learning by location occurs before learning by meaning, but over time, learning by location will help support learning by meaning.

Unit 2: Pronouns

Long-Term Goal: NAME will communicate about self, self in relationship to others, and others.

Target Vocabulary: 7 core words; names of people

1.	I	4.	my	7.	your
2.	me	5.	mine		
3.	myself	6.	you		

Personalization: Personalize the Pixon60 app with a photograph of the person in replacement of the Pixon for "I." Use the word "I" and the person's name above the picture. Keep the current Pixons for "me," myself, " "my" and "mine," changing only the version based on gender and/or ethnicity. Pixons are available in the app for pronouns of different gender and ethnicity.

Include names of important people in the person's life. These words can be added as an "extra activity" which would provide fast access to the top nine names with navigation to a page for additional names.

Specific Objectives:

1. NAME will use the "I," "me" and "myself" pronouns to refer to him/herself.
2. NAME will use the "you" pronoun to refer to others who are present.
3. NAME will use the "my," "mine" and "your" pronouns to mark possession of objects and actions.
4. NAME will say the names of important people in his/her life when interacting with them (e.g., as a call for attention, to express closeness, etc.).

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting pronouns.
    a. When something is hidden or missing, ask "Who is going to look and see what is in the bag?" Model "who" and say the word "maybe" when pointing at/verbalizing the appropriate pronoun (e.g., I, you).
    b. When engaging with the materials, ask "who wants to do it first?"
    c. When engaging with the materials, ask "Whose is this?"
    d. When exercising moderation with the materials, ask "who needs more?"
    e. When done, ask "who is going to pick what we do next?

1. Teaching Self vs. Others (I, me, myself, you)

   Teaching the concept of self versus others can be difficult to explain. Many teachers have struggled to model verbally the language they want the child or adult with language disabilities to produce. They might model and prompt the person saying: "I am drinking. Now you say 'I am drinking'." And the person responds by saying "you are drinking." This issue is not easily resolved.

   a. Look in a mirror. Use a mirror big enough to see both yourself and the child/adult with disabilities. Say "I see me" and "I see you." Then ask "who do you see?" and model "who you see?" Use visual prompts (e.g., laser pointer or flashlight) or auditory/visual prompts (e.g., a tap) on the pronoun you want the person to use.

   b. Look at a picture of yourself and model "I" + another word that describes how your look (e.g., pretty, nice, old) or a word that states what you are doing (e.g., eating, looking, sitting). Do the same with photographs of the child/adult with disabilities and emphasize the word "you."

   c. Wave at yourself in the mirror saying, "I wave at myself" or "I see myself." Model the use of the word "me" and "myself."

2. Teaching Object Pronouns (me, you)

   a. Wrap a small box in wrapping paper, doing it in a way that you can open it and put things in and out of it. Try and simulate the package that is represented in the Pixons (i.e., yellow box with red ribbon). Say "who is this for?" while modeling "who." Say "it could be for me or you?" while modeling "me" or "you." Give it to the person and let them open it up and see what is inside. Put something inside that the person can keep (e.g., small pieces of candy, pennies). Then have the person hide something in the box and say that it is for "you." You might need the assistance of someone else to help the person with disabilities.

3. Teaching Possessive-Adjective Pronouns (my, your)

   These pronouns require the use of another word (e.g., my car, your toy,). They act like adjectives to describe ownership of the object or action.

   a. Use the box that was wrapped and used for teaching object pronouns. Borrow something personal from each person. Hide one of the things in the box. Have people guess "whose thing" or "whose stuff" went in the box, was it my stuff or your stuff. Open the box and say "it is my thing" or "it is your thing."

   b. Play a game that involves taking turns to encourage use of the pronoun "my" or "your," along with the word "turn."

   c. Use a range of daily activities, such as lunchtime or getting dressed, to define the things being used with the possessive pronouns. For example, at lunch,

talk about the food on your plate being “my stuff” and the food on the other plate as “your stuff” to eat.

4. Teaching the Possessive Pronoun “mine”

The pronoun “mine” stands alone as a true possessive pronoun. Use the box that was wrapped and used for teaching object pronouns. Borrow something personal from each person. Hide one of the things in the box. Have people guess “whose thing” went in the box by saying/modeling “was it my thing” or “your thing.” Give the box to the person whose thing is in the box and ask “whose is it?” After opening it, prompt them to say “mine” or “it mine” or “that mine.”

Unit 3: Negation

Long-Term Goal: NAME will express negation in order to control and direct others with words instead of behavior.

Target Vocabulary: 5 core words

1. don't
2. not
3. trouble
4. bad
5. stop

Specific Objectives:

1. NAME will say "don't" to negate an action concept that is not acceptable or desired (e.g., don't want, don't like, don't look).
2. NAME will use "not" to negate a range of other language concepts (e.g., not mine, not go, not big).
3. NAME will say "trouble" to describe a situation or event that is problematic.

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting negative words. Change the routine by creating problems, making mistakes and presenting barriers. For example, do a cooking activity making something that person likes. Include some ingredients that would NOT be wanted or NOT good on the sandwich. The example used in this unit is for making a PBJ sandwich.
    a. Lay out ingredients for the sandwich, including inappropriate ingredients. Tell the person you are going to be making a sandwich. If possible, forget or lose one of the key ingredients. Ask "do you see the (ingredient)?" Model and prompt the words "not "+ "see" as you talk about what is missing.
    b. Find the missing ingredient and continue with the activity, but make a "mistake." For example, in making a PBJ sandwich, start to use your fingers to scoop out the peanut butter or put something inappropriate on the sandwich (e.g., a piece of paper). Any negative target word is appropriate.
    c. Evaluate how the sandwich would taste if you put weird things on it. Encourage the use of the word "not." Ask "should we put bugs on our sandwich? "NOT!" "How would it taste?" "NOT GOOD."
2. Teach opposite/negated concepts using the word "not" (e.g., big = not little, sad = not happy, awake = not tired, healthy = not sick.)
3. Have the person co-read simple books that feature a repeated line with the word "not" in it (e.g., "Are You My Mommy" and/or "Are You My Daddy").
4. Play games that involve action, like Simon Says (e.g., I say – go. I say – don't go).

Unit 4: Time

Long-Term Goal: NAME will communicate time ideas in order to direct activities and the pace of activities.

Target Vocabulary: 6 core words; extended vocabulary words of days, months, calendar words, time words.

1.	now	3.	ready	5.	early (time page)
2.	again	4.	not	6.	late (time page)

Specific Objectives:

1. NAME will use the words “now” or “not now” (or “late” to mean “later) to control the order of events in his/her life or a daily schedule.
2. NAME will use the word “ready” or “not ready” to mediate activities being done with or to him/her.
3. NAME will use the word “again” to repeat something over time.
4. NAME will use the words “early” or “late” to discuss his/her schedule.
5. NAME will participate in calendar activities, using time specific words (e.g., yesterday, today, tomorrow, days of week, months).

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting time words.
    a. Decide on the order to do something, asking “when should we do it?” Model “when” and prompt the words “now” or “not now.”
    b. When engaging with the materials, decide “how” to pace yourself. The person can tell you he/she is “ready” or “now” when he/she is prepared to do something. Model and prompt use of these words. Use “not now” to express the idea of waiting. The word “late” can also be used to mean “later.”
2. Make an “agenda” of things to do. Define what to do “now” and what to do “not now/later.”
3. Do any activities that involve the idea of “yesterday was,” “today is” and “tomorrow is.” Make visual support materials that help the person conceptualize that “yesterday” goes back on a calendar line and “tomorrow” goes forward. Obviously, use the days of the week in this activity to complete the sentence.
4. Calendar time in the classroom is the obvious time to focus on use of the days, months and seasons. Lessons on telling time provide opportunity to use these words: time, morning, afternoon, night, o’clock and numbers for time concepts.

Unit 5: Request and Direct Action

Long-Term Goal 5: NAME will make requests and direct action with action words.

Target Vocabulary: 22 core words

1.	come	9.	help	17.	stop
2.	do	10.	like	18.	take
3.	drink	11.	listen	19.	tell
4.	eat	12.	look	20.	turn
5.	get	13.	make	21.	want
6.	give	14.	put	22.	work
7.	go	15.	say		
8.	hear	16.	see		

Specific Objectives:

1. NAME will use a verb as a single word utterance to make requests and direct actions.
2. NAME will use a verb in a two-word utterance (e.g., pronoun + verb, verb + pronoun, verb + location word, verb + time word, negation + verb, question word + verb).
3. NAME will answer "what + do" questions with an action word.

Instructional Strategies:

1. Customize some of the pages (e.g., color/art, cook, book) with additional verbs specific to that activity. Any word repeated across pages needs to be located in the same location. Use green as the color code for the verbs.
2. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting action words.
3. Some individual with significant cognitive disabilities need to engage in the actual action activities in order to comprehend the concept and draw an association between the concept and the Pixon. Others will be able to simply have the Pixon described to them and they can make the association between the concept and the picture. In either case, it is beneficial to do hands-on and whole-body activities to teach these action concepts, the vocabulary and Pixons. Teach the words individually and/or in logical pairs. It may be necessary to engage another person in the teaching activity when the person with disabilities is directing someone else to do that action. One person can model/assist the person with disabilities and the other person can do the action.

4. To teach individual words, the following activities are starting points for building an association between the concept and the picture. However, it is NOT necessary to teach receptive understanding of the picture in order to use it with children.

   a. come – go = Direct someone to come or go. Model "come here" and "go away." The person being directed could come/go by walking, using a rolling chair, scooter board, etc.

   b. do = The Pixon for "do" is a finger doing something. Start by simulating this picture and do a finger painting activity using green paint. Then extend it to waving a green string or ribbon. Eventually, use "do" for a range of activities and actions that are not represented in this app, such as the following verbs: sit, stand, read, write, play, and sing.

   c. drink = Get a glass with a straw and some orange drink in order to teach the Pixon in the context of the picture. Then extend it to other types of drinking.

   d. eat = Teach in the context of eating something the child likes.

   e. get – give = Direct someone to get something and give it to someone. The person being directed could get a range of objects and give them to a variety of people. Model "get that" and "give you."

   f. go = Play a game that involves a green stoplight as a prop. Put a green arrow on the floor and "go" on the arrow when the stoplight says "go."

   g. hear – listen = Do all sorts of listening activities, emphasizing your ears are for hearing things. Contrast that with "listen" (e.g., I hear you vs. you listen to me.)

   h. help = The Pixon is a man helping someone who is sick and in an ambulance. Start in the context of helping a sick person by playing Doctor and extend to other contexts.

   i. like = The Pixon for "like" shows a smiling face and a sun. Make a smiling face prop and use it when looking at things you and the child might like.

   j. look – see = Play games that use both of the words, such as a modified game of "I Spy." Say "I am looking for something big" or "I see something big."

   k. make = Any kind of cooking or art activity can be used to teach the word "make." Extend the meaning to include making up a story, making a face and even making friends.

   l. put = The Pixon for "put" shows something being put into a chest. Start by teaching "put" in this context and put away toys into a chest. Expand that to putting things away inside cupboards, putting something down that you should not have and putting something on when getting dressed.

   m. say = The Pixon for "say" shows a brain bubble in which words can be written. Collect photographs of people and add brain bubbles to the photograph.

Write what the person might be saying. For example, a picture of a person jumping into a pool was used inside of the brain bubble was written the following: “This is fun. I like this.” Do other talking related games, like playing on the phone or Simon Says (I say ….. go now).

n. stop = Use a stop sign as a prop in activities the include the idea of “going” and “stopping.”

o. take = The Pixon for “take” shows Mr. Action taking something out of the cookie jar. Start teaching the concept and Pixon in this context and then expand it to other contexts (take off clothes, take time, take medicines, etc.).

p. tell = The Pixon for “tell” shows a boy telling his mother something. Do activities where you tell a female adult something. Then tell jokes, tell stories, and tell on someone.

q. turn = The word “turn” could involve turning around in space, turning something over or taking a turn in a game. Teach use of the word “turn” in each of these contexts.

r. want = The word “want” is one of the most frequently included and taught words on AAC systems. Most instructional strategies typically used involving request behaviors, where the person names something or some action they want using “I want” as a lead-in.

s. work = The Pixon shows a man at work at his desk with a hammer. Start in this context and do “work” on building something at a desk. Extend to other contexts, such as something not working properly or finishing your work, or even having a physical work out.

Unit 6: Describe and Comment

Long-Term Goal: NAME will describe and/or comment on a person, object or event.

Target Vocabulary: 9 core words; extended vocabulary of colors, numbers, shapes, weather descriptions

1.	all done	4.	big	7.	little
2.	all gone	5.	different	8.	more
3.	bad	6.	good	9.	silly

Specific Objectives:

1. NAME will use an adjective as a single word utterance to describe and/or comment on a person, object or event.
2. NAME will use an adjective in a two-word utterance (e.g., pronoun + adjective, adjective + noun, question word + adjective).
3. NAME will answer "how" questions with an adjective.

Specific Instructional Strategies:

1. Descriptive concepts are best taught with a range of hands-on materials that allow the person to experience how things look, feel, sound, smell and taste. Tap into a range of sensory channels to learn these concepts and the Pixon that represents that concept. Start by teaching the concept in a context the matches the Pixon metaphor and then expand the concepts into next contexts.
2. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting descriptive words.
3. To teach individual words, the following activities are starting points.
    a. all done = Make a puzzle out of a printed copy of the Pixon stop sign. Have the person put the puzzle together and when finished, say "all done."
    b. all gone = Using a toy frog, have the frog jump out of a bowl, jumping out of sight. Comment that the frog is "all gone."
    c. good-bad = A common gesture in many cultures is a thumb up for "good" and a thumb down for "bad." Evaluate many different things (e.g., foods, clean/dirty things, behaviors, etc.) and judge them as "good" or "bad." A prop of a thumb that can be rotated up or down is a handy teaching tool.
    d. big-little = Find a picture of a BIG ELEPHANT and a LITTLE DICE. Make sure the relative sizes of these two objects show that one is MUCH bigger than the other. Don't have them the same size. Use a variety of objects and compare them, describing them as either "big" or "little."

e. different = Go on a channel roll or channel surfing with a television and remote control. Check out shows and decide to watch something "different."

f. more = The more sign includes a musical note. Make paper musical notes. Listen to some music for a minute. Stop and ask for more, placing another musical note in the person's hand. The musical notes can also be used in a picture exchange strategy. With each note the child hands to you, he/she gets more music.

g. silly = Make a clown face mask, similar to the Pixon picture. Wear the mask and act silly. Find things around the environment and decide if it looks silly or not silly.

4. Combine the teaching of "how" from unit 10 with the teaching of these descriptive words.

Unit 7: Personal Attributes & Feelings

Long-Term Goal: NAME will use descriptive concepts to state personal attributes, such as appearance and feelings.

Target Vocabulary: 4 core words

1. happy
2. sad
3. sick
4. tired

Specific Objectives:

1. NAME will use the words “happy” or “sad” to describe his/her feelings and the feelings of others.
2. NAME will use the word “sick” or “tired” to describe his/her health condition.
3. NAME will ask how others feel with a feeling word (e.g., happy, sad, sick, tired) with a gesture or facial expression or with additional words (e.g., you happy, how you.)

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting descriptive words.
2. Combine the teaching of “how” from unit 10 with the teaching of these descriptive words that relate to personal attributes.
3. To teach individual words, the following activities are starting points.
    a. happy-sad = Focus on the masks for “happy” and “sad,” comparing the shapes of the mouths and the colors of the Pixons. Look at faces of people and see if the student can describe him/her as happy or sad.
    b. sick = Get a doctor’s kit and do pretend doctoring activities. Talk about being sick or not sick any more.
    c. tired = Yawn and simulate being tired, lying down on a bed, if one is available.
4. Use body part words with this unit if talking about what part of the person’s body is “sick” or “tired.”

Unit 8: Object Words

Long-Term Goal: NAME will talk about and/or request objects using either a generic object word or a specific word from the extended vocabulary row/page.

Target Vocabulary: 3 core words; extended vocabulary of words for art, music, reading, cooking, health

1. it 2. that 3. this

Personalization: Personalize the Pixon60 app by adding the word "thing" as a core word in row 2. The word "thing" is a highly useful placeholder word. Add more noun vocabulary to pages for art, music, reading, cooking, and health.

Specific Objectives:

1. NAME will use the words "it," "this" and "that" as a placeholder word for objects present in the activity or environment (e.g., want that, it mine, that all gone, this big).
2. NAME will use specific noun words from the various activity or category rows and pages (e.g., art objects, musical instruments, literature, cooking things, body parts) to name or request objects.
3. NAME will use a placeholder or noun in a two-word utterance (e.g., want book, get that, where paper).

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting object words.
2. To teach individual words, the following activities are starting points.
    a. it = The Pixon for "it" is a stuffed, wind-up animal of a sheep. Getting an object to represent this probably will need to be faked. Find either a simple stuffed animal of a sheep or make one with cardboard and cotton balls. Add a pretend wind-up knob on the top. Simulate it moving around. Find other wind-up animal toys and use them also.
    b. that – this = Teach "that" as referring to something that is out of reach, while "this" is something close by that can be reached. Make two large letter Xs. Place them on objects near and far from the person. Also, make one box with "'this" on it and one box with "that" on it. Whenever the person is given a choice between two objects, put one choice in the "this" box and the other choice in the "that" box. The person makes their choice using the words "this" and "that" instead of needing an endless number of pictures for objects.

Unit 9: Locations

Long-Term Goal: NAME will state locations and direct the placement of objects/actions.

Target Vocabulary: 3 core words

1. away 2. here 3. there

Specific Objectives:

1. NAME will use the words “away,” “here” or “there” to state or direct locations of objects/action.
2. NAME will use a location word in a two-word utterance (e.g., go away, come here, put there).

Instructional Strategies:

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting location words.
2. To teach individual words, the following activities are starting points.
    a. away = The Pixon shows a boat sailing away from an island. Act out this metaphor, using a map and boat. Then expand to the use of putting things away, going away and getting away.
    b. here-there = Point out things that are close by as “here” and further away as “there.” Use props of a black X and a yellow arrow.

Unit 10: Asking Questions

Long-Term Goal: NAME will ask questions in order to gain information.

Target Vocabulary: 5 words

1. who
2. what
3. when
4. where
5. how

Specific Objectives:

1. NAME will answer interrogative questions using available core vocabulary.
2. NAME will use a question word in a single word utterance to ask questions.
3. NAME will use a question word in a two-word utterance to ask questions (e.g., who go, where go, when go, how come, what do).

Instructional Strategies:

Many children and adults with language difficulties have trouble knowing the difference between asking and telling. In addition, many children and adults with disabilities ask very few questions of others.

1. Repeat any of the activities that you do with the person; however, use repetition with variety and change up the activity by targeting different words. In this case, you will be targeting question words.
2. Teaching Concept and Question Word Relationships
    a. Point out the LOCATION of the question words on the Pixon board, emphasizing that the specific question word is located in the area where possible "answers" are located. This helps the person understand the relationship between the question word (used to ask) and the answer (used to tell).
    b. Ask, the following concept questions:
        i. "When you ask about a person, what question do you use?" = who
        ii. "When you ask about a place, what question do you use?" = where
        iii. "When you ask about something you are doing, what question do you use?" = what
        iv. "When you ask about a thing, what question do you use?" = what
        v. "When you ask about a time, what question do you use?" = when
        vi. "When you ask about the size or shape or feel of something, what question do you use?" = how
3. To teach individual words, the following activities are starting points.

a. who = Make a “mask” that covers over a person’s face. Place a question mark on the mask. Have different people wear the mask and ask “who is it.” This activity helps focus on both the idea of the person and question mark, which is featured in the Pixon. Another activity is to play a sit-down version of the Game of Hide and Seek using the Pixon board. Mask three or four customized people words on the app using simple pieces of paper, such as sticky notes. Model “who” is under here? Then unmask one of the people words to find out “who” was under the mask.

b. what = The Pixon for “what” involves a question mark on the screen of a TV, using the metaphor of “what is on TV.” It can be used while channel surfing to see what is on TV. However, the word “what” is also used in a range of other contexts, including asking about actions and things. One school took a large box and made a “TV” that people could stand inside of. The person with disabilities asked “what do” and the person inside the box stated the action they intended to do, then did it. Actions that the person could do were selected from the Pixon board based on their ease in being able to act them out (e.g., drink, eat, get, give, take). The same box was used and objects were hidden in the box. The person with disabilities asked “what here” or “what there” and the other person revealed the object.

c. when = Take a clock and put a question mark over the face. A homemade paper clock with moveable hands works well, as well as an old wind-up clock with hands or a digital clock. Vary the time shown and cover the time with the question mark. Say “the clock shows ‘when’ we will do it.” Reveal the time after the person asks “when.”

d. where = The Pixon for “where” shows a map with the question mark. Get a map of your town or state/province. Look for places on the map, while modeling “where.” Draw a map of your house and hide things around the house or classroom. Prompt the person to ask “where” and then go search for the object until you find it.

e. how = The Pixon for “how” is a hammer pounding a nail. The metaphor is both conceptual (how do work) and auditory (how-pow). Use a hammer to build something and describe how it looks (big, little, silly, good, bad).

Unit 11: Polite Interaction

Long-Term Goal: NAME will use polite words to engage in social interaction with familiar and unfamiliar people

Target Words: 10 words

1. yes
2. maybe
3. no
4. please
5. thank you
6. you're welcome
7. sorry
8. excuse me
9. hello
10. goodbye

Specific Objectives:

1. NAME will answer yes/no questions with either natural gestures (head nod/shake) or the words from the app (e.g., yes, no, maybe).
2. NAME will use social etiquette words when interacting with familiar and unfamiliar people (e.g., please, sorry).
3. NAME will greet and part with either natural gestures and vocalization or the words from the app (e.g., hello, goodbye).

Instructional Strategies:

1. Engage in social activities to practice in natural contexts.
2. Make whatever props are necessary to connect the Pixon picture with the concept represented (e.g., brain bubble for "maybe," sad mask for "sorry," giving flowers for "thank you," opening a present for "you're welcome").

Unit 12: Letters and Numbers

Long-Term Goal: Name will use letters and numbers in literacy and math activities

Target words: alphabet, numerals

Specific Objectives:

1. NAME will use alphabet letters in classroom/home literacy and spelling activities.
2. NAME will, as able, use spelling as a strategy for communicating words not programmed in the Pixon60 app.
3. NAME will use numerals in classroom and/or home math activities.
4. NAME will use numerals in functional communication activities to state amounts.

Instructional Strategies:

1. Use best practice strategies to develop emerging literacy skills, including instruction on operational tasks (e.g., capitalization, delete character/word, clear display, punctuation).
2. Use best practice strategies to develop emerging number and math skills, integrating use of the app with other instructional technology for math activities.

Appendix A: Documentation Checklists

Name: _____

	Date:	Setting:	Communication Partner(s)	Activity	# of Utterances in Sample
Sample 1:					
Sample 2:					
Sample 3:					
Sample 4:					
Sample 5:					
Sample 6:					

Define the setting, communication partner(s)and activity for the samples selected. Use traditional language sampling techniques (audio taping, videotape, live transcription) and try to collect at least 50 utterances across six samples. Complete each section of the Communication Profile, as appropriate, based on these samples. Attach transcripts of the sample to this document.

Section 1: Communication Functions

Section 2: Vocabulary Acquisition

Section 3: Syntax and Sentence Production

Section 4: Morphology and MLU-M

Comments:

NOTE: The checklists for Communication Functions, Vocabulary Selection and Syntax are based on what is possible with the words in the Pixon60 app. The Morphology checklist is provided for your convenience in use with students; however, there is NO MORPHOLOGY pre-programmed in the Pixon60 app.

Section 1: Communication Functions

Check communication functions present in each sample. Base decisions on observation of the person, familiarity with the daily routine and information recorded in the journal. List additional functions, as appropriate. Add comments as needed.

Communicative Functions	S1	S2	S3	S4	S5	S6
request attention						
request for object						
request for action						
request for assistance						
request for recurrence						
request affection						
greet-part						
affirm-deny						
cessation						
rejection/refusal						
negation						
request information						
comment: object						
comment: action						
comment: time						
express emotion						
non-interactive selections						

Comments:

Section 2: Vocabulary Acquisition

Check off vocabulary selection characteristics present in the sample. Then count the number of words in the sample and calculate the % of words used. Add comments as needed.

Vocabulary Acquisition	S1	S2	S3	S4	S5	S6
Use of pronouns						
Use of people words						
Use of negation (not, don't)						
Use of verbs						
Use of question words						
Use of place holders for nouns (that, this, it)						
Use of specific nouns						
Use of time words (now, again, late)						
Use of place words (place adverbs)						
Use of conjunctions (if added to vocabulary)						
Use of interjection (if added to vocabulary)						
Use of adjectives (good, bad, different)						
Use of spelling						
Use of numerals/numbers						

Comments:

Section 3: Syntax and Sentence Development

For items 1-3, note what percentage (%) of the sample contains these types of utterances. For the remaining items on the list, check the variations that are used. List additional types of utterance created. Add comments, as needed.

Syntax and Sentence Development	S1	S2	S3	S4	S5	S6
Single word utterances						
Word strings or topic-comment utterances						
Emerging traditional syntax						
Two word utterances						
Agent + Action (I go)						
Action + Object (get that)						
Object + Possessive (that mine)						
Question + X (what that, where go, who help)						
Action + Descriptor (go again, help now)						
Three word utterances						
Four word utterances						
Five word utterances						
Showing verb phrase development						
Showing noun phrase development						

Comments:

Section 4: Morphology Development

Check features present in each sample. They are not arranged developmentally. Add comments, as necessary, to accurately reflect morphology production. Make NA if the morphology cannot currently be communicated on the person's board.

Morphology	S1	S2	S3	S4	S5	S6
plural "s"						
first/second person subject pronoun (I, you, it)						
third person subject pronoun (he, she)						
plural subject pronoun (we, they)						
object pronoun (me, him, her, us, them)						
possessive pronoun (his, hers, ours, theirs)						
reflexive pronoun (myself, yourself, itself)						
present tense (go)						
3rd person singular present tense (goes)						
present progressive verb tense (+ing)						
regular past tense (+ed)						
infinitive verb tense (to+ verb)						
future tense (will + verb, going to + verb)						
auxiliary verbs (is, was/were, be, have/has)						
modal verbs (can/have)						
question words (who, what, when, where, why)						
S-V inversion (are you, is he, can they)						
comparative forms (big/bigger)						
superlative forms (biggest)						
MLU-Words						
MLU-Morphemes						

Comments:

Appendix B: Products and Resources That Use Pixons

The following are products and teaching resources that use Pixons. Many of them will be useful in the use of the Pixon60 app.

Pixon Project Kit

The Pixon Project Kit is available from the Prentke Romich Company (https://store.prentrom.com/product_info.php/cPath/0_30/products_id/163). It sells for $149.95.

Minspeak Website

The Minspeak.com website includes a section on the Pixon Project (http://www.minspeak.com/teachers/InterventionPlanningArchives.php?PixonProjectResources=1#.Ut1AO_Yo6-c). This site includes sections on Pixon manual communication boards, Pixon pictures, Pixon curriculum supports and tips/information/directions. Other materials in the Teaching Materials Exchange (http://www.minspeak.com/teachers/InterventionPlanning.php#.Ut1BQ_Yo6-c) also include Pixons. All materials at this site are free.

Gail M. Van Tatenhove

Gail is the author the Pixon Project Kit and the Pixon60 app. She is a speech-language pathologist in private practice. She is licensed by Semantic Compaction Systems to develop commercially available therapy and teaching support materials that include use of Pixons (www.vantatenhove.com). The following commercial products are recommended as the best choices to support use of the Pixon60 app: Core Vocabulary Classroom Kit ($75.00 US), Pixon Cloth Carrying Case ($25.00 US).