APPsolute Fit:

Selecting the Right Mobile Device Apps

By Madalaine Pugliese and current students from the Simmons College Assistive Technology Graduate Program

MADALAINE PUGLIESE, Ed. S., is the owner of Assistive Learning Technologies (ALT) and is the author of the Stages© framework. She serves as Simmons College Assistive Technology Graduate Program Coordinator. She also serves as Assistive Technology Consultant for Marblehead, MA Public Schools. She can be contacted at madalaine@comcast.net.

As the original author of the Stages Framework, it became clear to me that an update to include strategies for selecting mobile device apps might also be helpful for the same reasons that software recommendations were originally beneficial. Not only does this article uniquely organize suggestions for mobile device apps, but these also align with the original Stages framework in order to help decision-makers guide recommendations for assistive technology assessment.

INTRODUCTION

In more than 20 years of working with graduate students in assistive technology, I have seen how the role of assistive technology specialists has changed. We are no longer only called upon to recommend physical access to the curriculum. Now we are also asked to become curriculum and strategy advisors. We need to understand content and be able to design modifications that maintain the essence of the classroom experience for any learner, regardless of challenge. The tools and strategies that we recommend must be invisible and put the student and curriculum first, resulting in a successful active learning environment.

In an effort to constantly update our graduate program curriculum, each year our faculty meets to reconsider which tools and strategies we'll address in our courses. In the last year, it became obvious that the integration of mobile devices and appropriate applications (apps) throughout our classes was imperative. We were noticing a frenzy of individual success story articles and lists upon lists of recommendations for mobile device apps that we didn't find as helpful as we hoped. Yes, we found lists of recommendations, however, few seemed to put the student first. Instead, they were organized by task and offered little information about features within the settings. This article will organize recommendations for mobile device apps from a developmental perspective and offer rationale for each recommendation that is supported by features or design found within the app.

FRAMEWORK FOR RECOMMENDATIONS

I teach a graduate course entitled Technology for Cognitive and Language Development and Alternate Assessment. In this class, we learn about assistive devices and specialized software that can facilitate including learners with cognitive or language challenges in the general classroom curriculum, along with strategies documenting learning. We take a developmental approach to language and cognitive milestones, following the Stages© Framework (Cambium Learning Technologies, 2008). This framework takes a research-based approach to defining observable learner characteristics for each Stage and recommends features to look for in computer software for learning that

▶ **PROCESS -** First apps were collected based on type of learner task, as well as favorable recommendations from a variety of previous lists, some referenced below. Next, apps were collected based on recommendations in response to queries on professional listservs. Finally, apps were collected based on reviews from users posted in the iTunes store. We not only collected apps that were especially designed for users with special needs, we also collected apps that were believed to serve the purposes as described within the originally published software selection guidelines. After a master list was collated, we provided these apps on iPads for graduate students to review and recommend for developmentally appropriate use within the Stages framework. This article collects their recommendations, considered from this developmental perspective.

▶ **STAGES FRAMEWORK -** The seven Stages are not grade level or age referenced. Instead, they are competency based. Each Stage identifies skills or milestones to achieve. Once those milestones are determined, and from the perspective of student first, features to seek in skill-building applications are suggested. The next step is to go on a search for apps that offer the identified skills practice, as well as the access features required for a specific student. With permission from Stages publisher, the following outlines specific learner characteristics and features to consider for each Stage, then lists our recommendations from what we believe is a developmentally appropriate perspective for learners with need to practice cognitive or language skills development.

match and scaffold student need. This approach has proven very helpful in supporting educators, therapists and families in selecting appropriate learning materials.

STAGE ONE – CAUSE AND EFFECT

ABOUT THE LEARNER

In Stage One, the learner begins to use an appropriate input device to control the computer and establishes a reliable access behavior. She realizes that pressing a switch or pressing on the touch interface for the device can make something happen on the screen. This reliable access behavior is the first step in the learning process.

The purpose of the app at this Stage is not to present information to discover, but to motivate the student to find out how to control the device. Therefore, appropriate apps generally offer very light content or meaning.

For example, when the user initiates an interaction, colors might change on the screen or a sound might play. For some learners, that amount of feedback is enough to call their attention to the device or motivate them to work toward device control. For others, the content itself might motivate interaction. Working toward an age-appropriate animation, humorous image or inviting sound can be just what some learners need to inspire more deliberate interaction with the app.

Selecting age-appropriate apps is important when considering motivation. Not all Stage One learners will be young children. Older learners may well need to begin at Stage One to develop device mastery through cause and effect.

FEATURES TO CONSIDER

When you select apps at this Stage, it is critical to consider the prompting for the learner interactions. Some apps offer only auditory prompting, motivating the learner to interact with the software by responding to encouraging sounds and spoken language. Other apps offer only visual prompting, motivating the learner to interact with the software by responding to pictures or animations that encourage the appropriate behavior. Some apps offer multisensory prompts that are both auditory and visual in nature. In selecting the appropriate app, consider the learner's strengths, as well as areas in which the learner needs practice.

STAGE TWO – LANGUAGE READINESS

ABOUT THE LEARNER

In Stage Two, the learner is exposed to deliberately richer language experiences. She learns that objects have names and that actions have words to describe them. The learner is not asked to identify objects, but simply to be a sponge and absorb information about them. This Stage develops receptive language and prelinguistic skills.

FEATURES TO CONSIDER

Finding apps that are designed only for Stage Two can be challenging because we are moving from a content-light to a content-rich environment. Keep in mind that you still need to consider the appropriate access device and procedures. In addition to using apps recommended for Stage Two, look for menu settings to help you modify Stage One apps for Stage Two learning.

Look for apps that offer brief, repetitive and consistent learner prompts. Use the type of prompt (auditory, visual or multisensory) proven successful during Stage One so that the interaction does not confuse or distract the learner from focus on the content. If she randomly activates a target by using an access device, reinforce the language content whether or not the selection was deliberate. Say, for example, "Look, that's a dog!"

Continue to use age-appropriate apps. For example, apps presenting traditional nursery rhyme content would be most appropriate for younger children, whereas apps depicting current music might be more appropriate for teens and adults. Pick apps that allow you to customize the content by adding digital photos of things that are personally familiar to the learner.

Some aspects of the learner's behavior may be measured and recorded. For example, some apps keep track of the learner's time on task. You can create a portfolio of observations so that improvement can be noted across several behaviors simultaneously and over time.

We can only expect a learner to make use of vocabulary or language to which he has been repeatedly exposed. In short, a learner will not understand the meaning of a word or concept unless he has seen numerous examples.

STAGE THREE – EMERGING LANGUAGE

ABOUT THE LEARNER

In Stage Three, the learner demonstrates an understanding of language through object identification and categorization. For example, she can show that she knows what a dog is (identification) and that an apple is a type of food (categorization). This is the first Stage in which the learner is asked to make a selection or respond to a question based on a prompt. Choice-making skills, as well as the ability to wait as choices are presented, develop now.

Also introduced in this Stage are the concepts of divergent and convergent thinking skills. We use divergent learning activities when we want

STAGE ONE - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
Baby Butterfly – my first colors	Kids Place	$0.99	Provides instant feedback on the screen. Wherever the user touches, the butterfly flies to that spot.
Baby Rattle Toy	Selena Soft Inc	$1.99	Allows the user to touch the screen to make objects appear.
Balloonimals	iDEC	$1.99	Using finger touches and swipes on the screen, the child can blow up a balloon, turn it into an animal and pop it. The colors, graphics, sound and action are exciting. Great for the learner who needs to develop better visual attention and the concept of cause and effect.
Bebot	By Normalware	$1.99	Touch the robot to make it move and make sound. Music synthesizer with unique touch control. Students learn they have control of program.
Bubbles	Hog Bay Software	$0.99	Pop bubbles with pleasing sounds. Can touch, hit or drag with finger or any part of body. Multisensory feedback
Fireworks	PDJ Apps	$0.99	Bright colors, simple to activate, changeable modes and patterns.
Hand Drums	Cody Rotwein	$0.99	Two drums are on the screen. A simple tap activates the drum momentarily; to continue play, the user is required to tap and release. There are 19 different types of drums that can be programmed. Settings also allow activation by shaking the iPad. Drum animations can be turned on/off depending upon visual needs of user. This is primarily a music app so there is no data collection. However there is a record option that would allow playback to determine the pattern of taps.
My Furry Friend	Plutinosoft	Initial purchase if free, but there are six in-app purchases for $0.99	Children can pop Leonard's bubbles and his balloon by touching them. Leonard imitates children's vocalizations, giving immediate feedback when a child vocalizes.
Pocket Pond HD	John Moffett	Free	Create soothing ripples with calming sound. Interact with fish (feed them, catch them) and change the weather. Touching the screen adds lily pads, dragonflies and more fish.
Rad Sounds	R J Cooper	$29.99	Cause and effect music program. Able to record sounds and import from iTunes. When the screen is touched, the people dance. Both momentary and timed switch play.

the learners to explore and discover content. We use convergent learning activities when we want learners to demonstrate how much they have understood from their earlier explorations.

FEATURES TO CONSIDER

Now that the learner has accomplished preliminary and reliable mastery of access to the learning environment and has benefited from a receptive vocabulary environment, content becomes our primary focus at Stage Three. We are ready to look at deliberate ways to determine how much vocabulary the learner has absorbed from all of her hard work during Stages One and Two.

Apps for a Stage Three learner provide opportunities to work with different levels of representation or abstraction with which objects are represented on the screen (such as photographs, drawings or symbols) as appropriate. Object and action identification is simply matching an object or action to its spoken name (for example, "Find the cat" or "Which one flies?"). Category identification enables the learner to demonstrate an understanding of language by categorizing or identifying objects that belong to the same group (for example, an apple is a type of food).

Apps that include function identification might feature activities that ask a learner to show her understanding of an object's purpose. It might ask the learner to discriminate among several objects that are called the same thing, but are used differently (for example, toothbrush or paintbrush or hairbrush).

Watch for menu or settings options that permit adjustments to the way the content is presented to the learner. For example, if the learner is startled by sudden animation, look for a way to turn it off. Such adjustments might also extend the range of the content, offering a cost-efficient strategy for using the same app as a learner progresses within a Stage, as well as from Stage to Stage.

Look for ways to change the activity from a simple presentation of named objects to one in which the learner must identify a target on her own. A Stage Two "Here is a dog" activity becomes a "Find the dog" activity in Stage Three. The content carries more meaning at this Stage, so be sure that the settings elicit the learner's best performance.

It is important that the app you choose supports the access method your learner uses. If she is a switch user, her interaction with the switch will now involve scanning. During scanning, choices are highlighted on the screen, one by one, then selected when highlighted by pressing a switch. The learner must wait for the desired target to highlight before she presses the switch. As she learns

STAGE TWO - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
ABA Flashcards, Fruits and Nuts	By Kindergarten	Free	50 flashcards of colorful and bright images of various fruits and nuts. If the item is touched, a clearly articulated audio feedback is given of what the item is.
ABC Wildlife	Peapod Labs LLC	$0.99	Animal themed touch and learn activity. Touch each animal to see the name spelled out, read, picture, and video.
Color Blender	WILLHALL SIAU	$0.99	Build receptive language skills and have increased exposure to nouns, verbs and attributes, which are provided in this simple app. This application exposes the user to colors and nouns that are that color. Very realistic pictures used throughout.
First Words	Story Boy Media	Free	In this app, students are presented a word. When they tap the picture, a voice speaks the item name. Items are also classified by function.
First Words	Serendipity Apps, Inc	$1.99	Teaches first words and builds vocabulary. Sound effects and animation. Child touches pictures on animated screen to reveal words with audio feedback.
First Words Deluxe	Learning Touch	$4.99	Touch the object and see and hear the name of the object. Goes through things with wheels, animals, in the house, and food.
Green Apple Color Flashcards	Robert Meier	$0.99	The top slide of the slide show labels the color and object. The center of the slide has an illustration of an object that is the color labeled at the top. The right of the slide has a solid stripe of the color being addressed. The bottom of the slide has the color label repeated in a bold font size. The slide is accessed by a single tap that reads the top label. A tap anywhere in the slide repeats the label. A single swipe advances to the next slide. Setting options provide a choice of having the slide read automatically when the page advances or requiring a single tap to read. Slides can be presented by showing multiple slides of one color before transitioning to a new color or randomizing colors with each slide.
Itsy Bitsy Spider	Duck Duck Moose	$1.99	The app is accessed by a single tap and release or single swipe. A music button allows you to record your voice or have prerecorded singing. It is an errorless explore program. Touching the spider activates singing and page turn. When program has been idle, the spider moves as a visual prompt to interact. Each page has a minimum of five interactive items. There are a total of four pages, which loop until exploration is completed. The pages are brightly illustrated but not overly stimulating.
Moo Baa La La La by Sandra Boynton	LoudCrow	$2.99	A familiar book for many kids, the iPad version is so interaction. The text is simple, providing simple language input. Pages are interactive, exposing children to early basic concepts.
My First Words-Flashards by Smart Baby Apps	MindValley LLC	Lite version is Free. $0.99 for expansion packet	Vocabulary builder. Vocabulary includes actions, animals, baby things, body, clothing, feelings, food, Mommy's purse, on wheels, shapes and toys. You can also add your own photos for classroom themes and their vocabulary.
Peekaboo HD	Gotclues, Inc	Free	Farm themed language development multisensory activity.
Peek Barn	Night and Day Studio	$1.99	When the user touches the animal, the animal makes the appropriate sound and the animal is labeled. This activity begins to teach single word labels.
PhotoTell	Adaptitec	Lite version is free; $9.99 for full features	Organize your own digital photos with audio captions that you record. Photos can be linked to multiple pages.
PickPix Tot	Ken Liu and Lisa Tang Liu (Crimson Hammer Software)	$2.99	Flash card environment provides the opportunity to expose the user to text labels and the corresponding object. It allows you to set the level to two sets, five sets or 10 sets. All audio prompts are human voiced. The home page provides two options "See Cards" and "Play Game." In the "See Cards" option, one color picture is displayed with a text label underneath it, an audio description identifying the object and its function is automatically played. A single swipe is required to move to the next card. Pictures are clear, vivid and on a plain background. Provides a consistent format of naming objects that can be viewed at the user's pace and can be repeated. The "Play Game" option is Stage 3.
Zoo Animals	Kindergarten.com	Free	A simple touch on real photos of animals and the name of the animal is spoken, followed by a musical flourish. Touch the screen again to get a new page. Good vocabulary builder and has enough action, sound and color to help with visual attention on the screen.

to use her switch in this way, she may need coaching to wait until the desired target is highlighted before she presses the switch. Waiting is a sophisticated skill.

STAGE FOUR – EARLY CONCEPTS

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ABOUT THE LEARNER

Stage Four marks another significant turning point in the learner's progress – the learner moves from language foundation to academic readiness. Until now, the content has focused on building a solid language foundation. The Stages framework stresses that before a learner can be expected to enter an established academic program, she must have a stable foundation in language. In Stage Four, the focus shifts toward more traditional development in both academic and social skills. Whereas the language foundation of the first three Stages followed a sequential pattern of development, academic discovery does not. The skills developed in Stage Four through Stage Seven are interconnected and may develop concurrently as the learner acquires complementary skills.

In Stage Four, the learner applies the language skills that were introduced in earlier Stages to progress toward academic readiness. This means that she begins to lay the foundation for learning to read, write and calculate. For example, in reading readiness, the learner develops phonemic awareness, and, in phonics, she matches letters with their sounds. However, she is not yet responsible for actually reading words. In math readiness, she is expected to learn to identify numbers and know their values by counting objects. She builds a vocabulary for understanding math, such as the language for making comparisons (small, medium, large). However, she is not yet expected to calculate or operate with the numbers.

The learner is becoming prepared for higher-level concepts by building the conceptual framework for the full academic content to come. Readiness for academics also means that she discovers the joy of learning new things and begins to build self-confidence.

FEATURES TO CONSIDER

Learners need opportunities to develop and experience both divergent and convergent thinking. Divergent thinking allows them to explore a body of information, making observations and gaining confidence as they explore. Convergent thinking allows them to demonstrate their understanding of the information that they have been exploring. Support and encouragement are vital to both types of learning experiences. This is a large step forward in both cognitive and language growth, thus, adults guiding the learning process tend to become very excited about the progress toward a more standard curriculum. In reviewing apps for content, you must exercise caution to stay true to what is most appropriate for your learner. Remember to look for software with readiness content rather than software with higher academic content.

A constructive readiness environment places more importance on the opportunity to explore concepts than on the correctness of responses. If an app provides feedback for learner response, take care that it offers a risk-free, supportive, encouraging learning environment.

For example, if a learner is asked to identify a certain item, letter or number, the software could eliminate distracters as incorrect responses are made. In this way, the learner is permitted to continue exploration, but with a more manageable number of targets. Eventually, the

STAGE THREE - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
ABA Receptive ID	Kindergarten.Com	$0.99	The user is given a direction to choose a picture out of an array of three. This activity teaches target words.
Clean Up Category Sorting	Different Roads to Learning	Free	Users sort items into toys, clothes and food. When the user puts the item in the right place (picnic basket, toy chest, closet) a star comes up on the screen as positive feedback.
Families 1 & Families 2	www.myfirstapp.com	FREE or in-app purchase of $0.99 for three additional families	An app to develop categorization skills. The user is presented with a "family" board with three images and the user must select the other family member from seven other pictures to complete the family.
Giraffe's Matching Zoo	TomatoInteractive, LLC	Free	Animal matching; object representation and categorization. Also, memory/focus and visual perception. Animation and entertaining sound.
Magic Piano	Smule	Free	Chose a song and students can play the tune by pressing each of the bubbles as they appear. No sound is produced unless the bubbles are pressed.
Preschool Games Farm Animals (Photo Touch)	Grasshopper Apps	$0.99	Real photos of farm animals; asked to touch the animal asked for. Voice output.
See Touch Learn	Brain Parade	Initial app and one library is free. Additional libraries/ lessons require a purchase ranging from $1.99 to $3.99	Pre-loaded lessons and the option to create your own lessons. Lesson set up is a text directive at the top of the screen which is read using synthesized speech and an adjustable amount of pictures below it. Pictures do not have text labels. An example directive is "Point to the cat." A response is activated by a single tap on a picture. Feedback for an incorrect answer is a sound with a picture shake. Feedback for a correct answer is provided by a sound and zoom in on the correct selection. Single tap on the next button advances to the next picture set. Preloaded lessons have levels of Basic, Medium and Advanced. The Beginner level gives the directive to "Touch the ___" and only provides one picture (errorless). The next slide repeats the same directive but now presents a field of three pictures, including the picture from the first slide. The Medium and Advanced levels repeat this format but increase demands by adding choices that are more similar in nature and adding various vocabulary to the directives, such as "point, touch, press" for the same action. Feedback response sounds can be customized through a menu. Audio and visual prompts can be turned on/off.
Verbs with Milo (Could be Stage Two also)	Doonan Speech Therapy	$2.99	App for giving meaning to verbs. Children touch Milo and he does an action. The word for the action pops up on the screen and is said aloud, combining multi-sensory input. There is also a button to hear the verb in a phrase.
What's That Sound	Different Roads to Leaning Inc	Free	Real pictures category ID. Asked to choose the object that makes the sound. (i.e. alarm clock that rings)
Which Go Together	By Kindergarten	$0.99 cents	Categorizing of items. The child problem solves and figures out which item goes together using bright and colorful images
Word SlapPs Lite	Zorten	Lite version is Free. Full version is $2.99	Teach vocabulary, object identification and categorization with choice making skills. The lite version of this app provides the categories of animals and colors. Select a category and there are three levels. Level 1asks you to find the object given one choice. Level 2 asks you to find the object given two choices and level 3 asks you to find the object given three choices. Correct answers are followed by audio and visual rewards.

correct response is presented in isolation. After locating the correct item, the learner should be rewarded for finding it no matter how many tries it took. This helps build self-esteem and confidence.

Both social and academic developments go hand-in-hand at Stage Four. It is important to provide opportunities for social interactions and play at this Stage. Many child development specialists believe that if there is a barrier to working in small groups, interacting in fine and gross motor activities, engaging in pretend play, sharing materials or communicating, then there is a potential roadblock for cognitive and further language development. If there is an obstacle to the peer interaction process, select apps that create electronic play environments to facilitate such activities. Alternative access devices offer ways to customize and simulate the play opportunities so that learners of varied abilities can play together in facilitated settings.

STAGE FIVE – ADVANCED CONCEPTS AND COMMUNICATION

ABOUT THE LEARNER

The majority of the learner's academic growth occurs at Stage Five. She expands her skills from learning simple mathematical concepts to solving more complex problems. She grows from basic spelling skills to full and fluent literacy. This type of academic journey takes time. The development of full academic functioning begins now and continues through the rest of the learner's life.

A Stage Five learner should be working on Stage Seven writing skills at the same time that she is working on complementary reading skills. She will be reading and writing simple sentences at first. As skills progress, she will be expected to incorporate vocabulary words and other content-related words, as various subjects of study become part of her curriculum. For example, if a particular word is part of her study of science, she may

STAGE FOUR - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
ABA receptive ID – by Class	Kindergarten.com	Free	Categorizing activity using real pictures. Asks you to pick the picture receptively (example – show me the one that you take to school – the backpack)
ABC Magic 2	Preschool University	Free	Learn letter sounds through rhythm and repetition
Abc PocketPhonics Lite: letter sounds and writing plus first words	Apps in my Pocket Ltd.	FREE or in-app purchase of $2.99 for complete alphabet	Three apps in one that, combined, address many readiness and assessment activities
Animals in Pieces HD	RT Studios	Free	Beginning puzzles of four to five pieces. Pieces can be moved and placed with a finger or by touching a button (magic wand). Helps the child practice organizing shapes into a whole. After a puzzle is solved, the child earns a chance to listen to a nature story about the animal. Settings allow choice of relaxing music or no sound and English or French. This is nice for grades K-3 as a science resource.
Autism Shapes	Dr. Gary Brown and Bob Bradley	$1.99	Select the shapes for the students to identify. The program gives them two choices of shapes and the student needs to correctly identify the prompted shape.
Baby Shapes	Kindergarten.com	$0.99	This app describes objects by shape. This activity teaches shape concept.
Bert's Bag	Sesame Workshop	$2.99	Math readiness by having the user open a paper bag by sliding their finger over it. Next, the user must shake the bag by either double tapping the bag or shaking the iPad. Objects then fall out onto the table. The user can then slide an object over from the pile or single tap the object. As each object is touched, it is verbally counted and the number of items also appears. Already counted items cannot be counted again. When all items are counted, the total is repeated and the category label for the objects is also repeated. Bert provides verbal prompts when the program is idle for more than five seconds.
Count TV	Sesame Workshop	$2.99	Math readiness skills through errorless counting. The user first chooses a number from one to nine on a number pad by a single tap. This selects a Sesame Street video focused on the number selected. The video pauses at a point where the user is asked to count the objects by a single tap on each object. When an object is tapped, a purple star is placed over the object to show it has been counted. If the user tries to count it again, a verbal prompt is given "oh, you have already counted that one." As objects are counted, a verbal and visual number count is provided.
(DTT) Shapes	ZbobbApps.com	$3.99	Teaches shape discrimination. At first, the child has two choices, then the program can be set for more. The shape words are paired with the images. Motivating verbal rewards keep the child going. This is a beginning game for the Stage Three learner to move towards, making choices using a finger touch. Designed to support teaching using discrete trial training.
Letter Land	Ensena Soft	$0.99	This app provides multiple activities for matching letter names.
Magic Penny 1	Magic Penny Reading, LLC	$9.99	Teaches phonemic awareness with letter recognition. Has both parent version and teacher version so child can also use at home.
Monster Squeeze	McGraw-Hill Company	$1.99	In Monster Squeeze, students are given a number line and have to make guesses to determine the secret number. As students guess, they are given prompts, such as "that is larger than the secret number" or "that is smaller than the secret number." Students need to use these clues to guess the secret number.
My PlayHome	Shimon Young	$0.99	Navigate through different rooms of the house as your child makes different members of the family do things. The adult can give students directions or users can give each other directions, having family members do different things and manipulate objects in the house
Phonics Made Easy	School Zone Publishing	$4.99	Skills addressed include letter sounds, rhyming, blends and digraphs.
Pre Math HD	By Mintmomeg	$1.99	Development of basic mathematic skills. There are 10 different games of colorful and easy-to-use games to develop basic math skills. Gives auditory instruction and feedback from a child.
The Foot Book	OceanHouse Media	$3.99	Text is highlighted as it's read so children can follow along. After the page is read, user can tap on words and the word will be highlighted and read again. Many opportunities to hear rhyming words as well.

be asked to read this word in other classroom materials.

Apps recommended for developing Stage Seven writing skills certainly can be used as practice or study environments for addressing Stage Five language arts and reading skills. Apps used for spelling practice at Stage Seven can also be used to develop Stage Five reading skills.

FEATURES TO CONSIDER

Stage Five reflects local and national curriculum standards and traditional approaches to academic content. The curriculum your learner follows will be set locally and will address a broad range of skills needed to succeed in areas of study, such as reading, mathematics, science, social studies and geography.

We can never know how much any learner will achieve. We must assume that all learners will progress through Stage Five if given the proper support for modifications and scaffolding in the learning process. These might include the use of the right adaptive access device, as well as appropriate content.

A Stage Five learner is able to make choices in the activities used and to pace herself throughout her interactions with the device. Look for controls, such as enlarged or spoken text, that allow her to make selections, to save or print her work and to quit the program independently.

STAGE SIX – FUNCTIONAL LEARNING

ABOUT THE LEARNER

A Stage Six learner applies academic concepts to real world situations. In this Stage, the learner is aware of and wants to be involved in the world around her. She begins to apply her knowledge to allow her to become more independent. The focus changes from academics to applied knowledge and functional learning skills, commonly referred to as activities of daily living (ADL). This is indeed a thrilling Stage for the learner. Academics and social skills come together in a pragmatic way for the learner at this time. The learner's needs and goals will continue to dictate the focus and content of her education. For example, some learners may not achieve the skills needed for reading for enjoyment. However, they may acquire the ability to read for safety, which is an important skill

STAGE FIVE - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
Bluster!	McGraw-Hill School Education	Free	Single or multi-player, match rhymes, prefixes, suffixes, synonyms, homophones and adjectives. Positive reinforcement and unlimited tries.
Everyday Mathematics Name that number	McGraw-Hill School Education Group	$1.99	Practice computation and order of operations. It consists of addition, subtraction, multiplication and division.
iTouchiLearn	Staytoooned	$1.99	Teaching word and image associations
iWriteWords	gdiplus	Free - $2.99	Teaches and reinforces letter/number construction and spelling. Fun and rewarding images and sound effects.
LAZ Reading Library (A – I)	Reading A-Z	$6.99 for library of each level; some free, some $0.99 for each individual book	Books are available at all reading levels. User can choose an independent level and read with independence.
MathBoard	PalaSoftware	$4.99	Math operations in a multiple choice or fill in the blank quiz format. Setting options allows variability in what operations are addressed and how many are addressed at a time. The number of problems in a quiz can be set from 10 to 250. Problem layout can set as either horizontal or vertical. The number range can also be customized according to ability level. Quiz sessions can be timed or un-timed and a record of the user's time and accuracy level is kept. Multiple users can be maintained. Users have access to a virtual chalkboard where they can work out problems. There is also a problem solver, which provides step-by-step instruction to solve the problem. Incorrect answers are marked in red.
Milly and Molly and the Bike Ride	Kiwa Media	$0.99 for each book in the series	A series of books with a wide range of features. Stories will read aloud. Users can click to hear individual words. Users can illustrate themselves or use published pages. Users can record themselves reading. Font sizes are adjustable. Stories can be read in five languages.
MyWordWall	FunPlay	$0.99	Reinforces early learning, reading and writing skills. Includes 75 sight words, 12 word families, 65 word family words. Includes word puzzles, spell to match image, seek/find, memory match. Offers multi-sensory feedback.
Number Fun	Icodeway.com	$1.99	Practice for all math facts: addition, subtraction, multiplication and division. Bright graphics. Can set level of difficulty. The Stage Five learner can work on computation skills using an online calculator.
Pizza Fractions: Beginning with Simple Fractions	Brian West	Free	Simple app that reinforces learning of fractions related to functional activity of dividing pizza into pieces.
PopMath	PopSoft	$1.99	Basic math facts practice in colorful interface
Spelling Bug	Power Math Apps	Free	See, listen and spell 50 most common sight words.
Spellbug	By ProjectOneLA	$2.99	Assist children in beginning spelling and reading. There are 60 preprogrammed words or you can customize your own list. You can add your own photos and voice.
SpellBoard	PalaSoftware	$4.99	Quizzes come preloaded but can also be individually created and customized. The app maintains data on multiple users. Words lists are based on Dolch graded lists. Access is by single taps and swipes. Words can be read by a single tap on the word and are human voice recordings of a child. The study part of the app offers the user a visual of the word, pronunciation of the words and then reads a sentence using the word. Words can be copied using a virtual whiteboard. Whiteboard does not provide feedback of proper spelling. If the sentence does not provide enough context support, the definition button can be accessed for a specific definition. Definitions do not have text-to-speech support. Quizzes can be presented in the same sequence as the study quiz or randomized. The user is required to use an onscreen keyboard to input answers. Immediate feedback is provided through a visual of a green checkmark or red X. A record of words attempted and percentage correct is stored in the user file.
Splash Math	Study Pad, Inc	$4.99	Creative math app with 16 chapters covering 200 math skills and an endless supply of problems. Fun and reinforcing graphics and sounds.
Word World: Build a Word			
Word World: Build a Word Lite	WordWorld LLC	$0.99	Based on the PBS show Word World. Shake the screen and the letters of the names of the characters mix up. Slide the letter onto the word and the character comes to life. Lite version has only "Dog." Regular version has more characters.

for community independence. In this way, Stage Six is an academic detour from Stage Five, still offering educational content but in a more applied way.

FEATURES TO CONSIDER

This Stage does not concentrate on educational skills in isolation. Instead, applied, practical, real world skills are the focus in a supportive and frequently practiced environment. Many of the topics addressed in Stage Six, such as money skills, have been introduced before. Now, however, the material must be practical and connect with an authentic experience. A learner might rehearse money skills within the electronic learning environment, then use those same skills when shopping for supplies at the school store.

The graphics shown on the screen should present objects realistically, as in photographs, rather than in representational drawings. This helps the learner make the connection between the representation and the real world object. A green rectangle with a large five drawn in the center does not look like an actual five-dollar bill. The Stage Six learner will have a difficult time understanding how to make the connection (generalize) between working with money in the apps practice activities and handling real money if the images on the screen don't look like the real thing.

Incorporating video modeling is ideal at Stage Six. Not only does a learner practice a skill in real world context, she also sees interactive real life examples of desired behavior.

STAGE SEVEN

ABOUT THE LEARNER

The ability to clearly and independently express one's thoughts on paper is the most sophisticated skill in the Stages framework. Independent writing is a high-level skill that incorporates other literacy skills, such as reading, spelling and organization. Because there is a separate teaching methodology associated with writing and the related apps selection is unique, it is set aside as a separate Stage.

A learner's ability to write independently is essential to continuing her education, seeking employment, living independently and communicating with others. When a learner writes a sentence, tremendous potential for academic independence begins. The skills involved in written expression include both language use and mechanical conventions, such as spelling and grammar.

Writing skills are interwoven with other skills considered in earlier Stages. At Stage Four, a learner works on reading readiness skills by trying to write the letters of the alphabet and perhaps her own name. She also begins to associate sounds with letters. At Stage Five, she uses writing skills to complete most academic assignments and projects. She writes simple sentences at first, and, as her skills develop, she will incorporate vocabulary words and content-related words she encounters in other subjects.

Keep in mind that learner independence in written language is the eventual goal. Learners with more intensive cognitive and language delay can work toward supported independence in their writing. Stage Six learners do not write for academic purposes, but are expected to master functional writing skills that are needed for real-world efforts, such as writing shopping lists and filling in job applications.

FEATURES TO CONSIDER

Most educators agree that multisensory writing environments can be very effective. It is widely accepted that the more senses the learner uses, the better she will understand and remember the skills addressed. Giving learners the opportunity to apply both eyes and ears to the writing process employs this multisensory advantage. Mobile devices offer a medium where learners can benefit from the visual presentation of letters and words combined with sound. People with learning challenges can greatly benefit from using a word processing program that takes advantage of the device's text-to-speech capability.

Using auditory feedback, such as text-to-speech, can enhance a learner's ability to self-correct writing errors. This builds both independence and self-esteem. Turning on or off features that offer auditory reinforcement eventually gives the learner full control over the writing and editing process. Using headphones helps make this process more private. If two learners are working cooperatively, a simple audio splitter cable, available from any electronics shop, allows them to work together, both hearing their work simultaneously through headphones. While skills evolve, observe how and to what degree the learner uses auditory feedback. For example, is she helped by an auditory support that reads back each word as she types it? Does font type, size or color encourage or facilitate independence?

Productivity tools, such as word completion or word prediction, can be enormously helpful as long as the learner understands the pros and cons of their use. These tools save keystrokes and incorporate perfect spelling as long as word use is carefully considered. Learners need to be aware when words are changed because of the use of one of these tools.

STAGE SIX - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
Coin Math	Recession apps	$1.99 and free lite version	Wide range of money activities from simple coin ID to more complex concepts.
Community Signs and Words	The Conover Company	$1.99	Designed to teach and reinforce common signs and words found in the community for independent living. Contains videos and customizable assignments.
Count Money – Coin Matching	Grasshopper Apps	Free	The real life images used for identifying and counting coins.
First Then Visual Schedule	Good Karma Apps	$9.99	For individuals who benefit from a visual and structured schedule and environment.
Going Places	Model Me Kids	Free	Video models of community, social and ADL skills of places people may go, what to expect. Photo slideshows of children modeling appropriate behaviors.
Life Skills Sampler	The Conover Co.	Free	Videos modeling real life environments and tasks that might be unfamiliar to the learner, such as the airport. Offers videos for simpler topics, such as one for apples. Helpful for life skills learning.
LookTel Money Reader	IPPLEX	$1.99	Mobile assistant to verify money and to ensure you are getting the right amount of change back.
Shopmate	Doublewedge	$0.99	Shopping list organizer. You can set the store, date, payment information and additional notes. Add items to a list and the app will sort them for you when shaken. You can e-mail or message your list. The list can be populated from previous lists and from a favorites list. Gives statistics of shopping patterns as well.
Shopping List	Target Works	$1.99	User generates a grocery list using a combination of pictures, illustrations and text labels. It comes with a starter library; however, photos can be imported from your own library. The library is categorized according to departments of the grocery store. Access is through a single tap. The selected item is transferred to the list on the left and automatically put in a category heading. The list can then be used at the store. A single tap to the item on the list checks it as bought and moves it to the bottom of the list. When adding your own photos, you have the ability to add a label and category. The app does not provide text-to-speech support; however ,Voiceover can be used in the lists page.
Tell Time-Little Matchups Game	GrasshopperApps.com	Free	Telling time matching game with digital clock and analog clock.
ZoomReader	Ai Squared	$19.99	Optical character recognition and text to speech used to read back text captured by device camera.

CONCLUSION

This is by no means is a comprehensive list. For example, we chose not to mention apps designed for augmentative communication. Another example is the category of reminders or schedule support apps. There are numerous valuable options to consider. Making recommendations for mobile device apps is like aiming at a moving target. It's practically impossible to keep meaningful and timely lists of recommendations. Instead, it is important to consider a framework within which apps might be considered on an ongoing basis.

Because the Stages framework was originally developed as a way to suggest meaningful software recommendations, it makes sense to apply this strategy for also selecting applications for mobile devices. Although there is minimal cost involved when considering which app to select, there is so much more than cost to be considered. Making developmentally appropriate content selections lead to learner independence and success in vitally important ways. Mobile devices offer an unprecedented learning environment that must be purposefully implemented.

Using this framework for selecting apps, it is possible, even likely, to find content that was not necessarily designed for users with special needs. Not only are mobile devices socially acceptable, but now fun content and skills practice might also be provided through the use of apps designed for anyone, as long as the features we need are provided in settings and content adjustments created within apps features. This opens a whole new world for differentiating learning opportunities for everyone.

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WEBSITES

http://www.diigo.com/user/mobilelearning

My own diigo page collecting articles and Web sites for further information

http://mobilelearning4specialneeds.wikispaces.com/

Wiki created and updated by Apple Distinguished Educators Mark Coppin and Luis Perez

http://ipadforlearners.wikispaces.com/

Wiki created and updated by Karen Janowski of EdTech Solutions

http://www.iear.org/

Web site posting apps recommendations for and by educators ■

STAGE SEVEN - APPS TO CONSIDER

Title	Publisher	Cost	Rationale/Description
Dr. Peet's Writing Buddy	Dr. Peet's Software	$1.99	Speech to text support for the writing process. Font size and color are customizable. Information written can be used to text or e-mail a contact in the contact list. Videos and maps can also be searched by accessing an icon that will load the appropriate Google. Talkback settings can be customized to read letter, word, sentence or all the above. Common mispronunciations or abbreviations can be customized to be read in a particular way.
Evernote	Evernote	free	Organize your notes and ideas. Capture in one place but access from other places and on other devices.
My Photo Story	CLIC360	1.99	Create your own story using pictures and text in a simple comic book type layout.
Sentence Builder	Northwest Kinematics	$3.99	Students choose the correct words to build a grammatically correct sentence about a picture. The user's progress is tracked individually and each user has a stats page.
SentenceBuilder	Mobile Education Tools	$3.99	Help learner generate grammatically correct sentences via a selection wheel/spinner. Helps improve grammar as well as sentence structure by providing lists of words to select from and gentle feedback where he makes a mistake.
Speak It	Future Apps Inc.	$1.99	The user can enter text via the on-screen keyboard or cut and paste information from another document. Accessing the "speak it" button with a single tap will read the document. An audio file can be generated and e-mailed. Documents can be saved within SpeakIt. Spelling errors are not prompted or corrected. Voices can be changed and purchased through iTunes. Font size, voice volume, and voice speed can all be customized.
Story Builder	Mobile Education Tools	$3.99	Helps students improve paragraph formation, improve integration of ideas, and improve higher-level abstractions by inference. Audio clips promote improved auditory processing.
Story Patch	Haywoodsoft LLC	$2.99	Story starters are available if needed, or students can write their own story. There ares over 800 Illustartions. They can be customized, and photos can import. There is also a tutorial and stories can be read and shared by email.
Story Wheel	EverAge	Free	Students record a story by spinning a wheel to get a picture, and then narrate a portion of the picture. Students can then listen to their story with animated pictures.
Type-O HD	2nd Guess	14.99	Teaches writing & spelling skills. Audio feedback, word prediction, spell check. Writing can be e-mailed or saved on clipboard for opening elsewhere.
Writing Prompts	21x21 Media, Inc	$1.99	Writing prompt generator with scene elements,sketches,colors,genres and writing types