Course Abstract

Within the past few decades, technological advancements have exerted a significant influence in a broad range of contexts, including that of the therapeutic setting. Speech-language pathologists have been inundated with a myriad of technological choices to incorporate into their clinical practices. This Introductory level course discusses research-based tactics for identifying technological applications that fall within the guidelines of developmentally appropriate practices, helping speech-language pathologists navigate the challenges of providing fun, meaningful, and engaging online activities for clients that are also within the scope of best practices.

NOTE: Links provided within the course material are for informational purposes only. No endorsement of processes or products is intended or implied.

Learning Objectives

By the end of this course, learners will be able to:

- Recall technological advancements in mobile applications (apps) and their influence on learning
- Identify the theories discussed as a framework for app integration
- Recognize evidence-based criteria methods for assessing apps
- Differentiate between apps that demonstrate characteristics falling within the scope of best practices for technology integration into therapy

This course is offered for .2 ASHA CEUs (Introductory level, Professional area).
Introduction

Over the past decade, technological advancements have continued to exert a significant influence on the incorporation of technologies into the daily practices of professionals within their individualized work environments. Learning technologies have been especially influential in the sectors of education and speech-language pathology, in that the development of mobile applications has provided a dynamic platform in which school-aged children can engage in meaningful learning experiences through digital media technologies.

These highly digitalized learning platforms have increasingly demonstrated gains in popularity as a growing number of speech-language pathologists incorporate mobile applications into their daily clinical practices. The growing access to digital learning tools has resulted in a qualitative shift in how clinical services are offered during the evaluation and treatment process for children with speech and language disorders.

As speech-language pathologists, we are responsible for providing our clients with evaluative and therapeutic interventions that are in alignment with evidence-based practices. Given the onslaught of digital media technologies, speech-language pathologists have been inundated with a myriad of choices when selecting mobile applications to incorporate into their clinical practices. Notably, there has been a lack of professional guidance in identifying technological applications that fall within the guidelines of evidence-based practices, thus leaving speech-language pathologists at a disadvantage when navigating the challenges of providing clients with fun, meaningful, and engaging online activities that are also considered within the scope of best practices.

This course delivers a research-based approach to the identification and selection of those mobile applications that both foster fun, engaging, and meaningful learning experiences for children, and are also aligned with developmentally appropriate, and best, practices.

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Timed Topic Outline

I. Introduction; Technology in Therapy: A History (30 minutes)
   - Advent of Mobile Applications; iPads in Education; iPads in Speech Therapy

II. Theoretical Perspectives (20 minutes)
   - Socio-constructivist Theory; First Generation Activity Theory; Second Generation Activity Theory

III. Becoming Critical Consumers (15 minutes)

IV. Moving Clients from Passive Consumers to Knowledge Producers (5 minutes)

V. Mobile Learning Applications (30 minutes)

VI. Additional Resources; Conclusion (5 minutes)

VII. References and Exam (15 minutes)

Delivery Method

Correspondence/internet self-study with interactivity, including a provider-graded final exam. To earn continuing education credit for this course, you must achieve a passing score of 80% on the final exam.

Accessibility and/or Special Needs Concerns?

Contact customer service by phone at (888)564-9098 or email at support@pdhacademy.com.

Course Author Bio and Disclosure

Dr. Nikosi Darnell, Ph.D., M.S., CCC-SLP, is a licensed speech-language pathologist and child development specialist with over 16 years of experience working with clients across the lifespan in a myriad of settings. She received her degrees in speech-language pathology and child development from Texas Woman's University in 2002 and 2013, respectively. During her studies in the Family Sciences program, Dr. Darnell developed her passion for the effective integration of technology into the learning process for students. This culminated in her dissertation Best Practices in Teaching K-3 Online: A Content Analysis of Distance Education Journals, Blogs, and Electronically-Documented Surveys. In furtherance of this key area, Dr. Darnell has continued to present on an array of related topics at conferences hosted by the Texas Speech-Language-Hearing Association (TSHA), International Society for Technology in Education (ISTE), Texas Computers in Education Association (TCEA), American Educational Research Association (AERA), and Greater Homeschool Convention (GHC).

Currently, Dr. Darnell provides speech-language therapy, consulting, and educational services through her company, Clearview Speech and Consulting Services, PLLC. She is a qualified and proven clinician with expertise in the evaluation and treatment of speech, language, and swallowing disorders, clinical supervision, virtual learning, telepractice, child growth and development, executive function, educational technology, parent/caregiver education, and professional development. Dr. Darnell has enjoyed teaching online and blended courses for university level students, and continues to instruct parents, caregivers, teachers, and therapists through seminars, webinars, and conferences.

DISCLOSURES: Financial – Nikosi Darnell received a stipend as the author of this course. Nonfinancial – No relevant nonfinancial relationship exists.
Technology in Therapy: A History

Advent of Mobile Applications
On January 27, 2010, Steve Jobs transfixed the world by introducing the first portable tablet computer that was equipped for viewing videos, listening to music, playing games, reading books, and much more: the first iPad was born.

Until that time, technological advancements had been limited to computer desktops, laptops, smartphones, netbooks, Ebook readers, personal digital assistants (PDAs), and mobile chips – all precursors to the development of the iPad. For instance, the introduction of laptops provided users with a portable means for computer use, leaving users untethered to their desktops. Laptops were further refined through the expansion of netbooks, which were basically a light-weight, smaller-screen version of the laptop with increased battery-life capabilities. Although devices were becoming smaller in size, this did not negate the growing demand for powerful battery sources to satisfy the burgeoning needs associated with advancing technological devices; in response, companies began developing mobile chips in the 1990s. This led to the development of the first hand-held device, the PDA, a touchscreen device that included a calendar, address book, and email platform for users. Smartphones then combined the technological components of a cellular phone with the functions of a PDA. Further developmental processes led to the creation of the iPhone, which introduced users to multi-touch screen controls that increased interactivity between users and their mobile devices. User interactivity with mobile devices was further enhanced through the development of Ebooks, which allowed users to download books within a matter of seconds on their mobile device – a completely new way for consumers to read books using a digital platform. These technological developments were the pioneering efforts that culminated in the creation of the iPad, which has revolutionized, and continues to revolutionize, how we interact with mobile technologies in our everyday lives.

iPads in Education
Almost immediately after the introduction of the iPad, schools began adopting it as a means of addressing the learning needs of students within their districts. For many schools, the iPad was initially implemented within the framework of a pilot study in which school districts were able to complete a comparative analysis of outcomes based on usage of iPads versus textbooks for specified courses. For instance, in April 2010, the Monte Vista Christian School in Watsonville, California, was an early adopter of the iPad via a pilot study in which it replaced traditional textbooks in an advanced placement history class. In addition to discovering that electronic textbooks were one-third the cost of traditional textbooks, school leaders postulated that the incorporation of the iPad into learning curriculums would enhance learning outcomes due to increased access to digital resources, such as photographs, newspapers, electronic search engines, and additional resources not commonly found in a history textbook.

As of 2013, portable tablets were identified as being implemented in classrooms daily in over 4.5 million schools (Etherington, 2013). Specifically, iPads were identified as being the most prevalently used mobile technology device in the educational sector all over the world. In North America, the iPad accounted for over 75% of the educational market in the United States and a staggering 90% in Canadian schools.

Entry of the iPad into the educational sector resulted in a paradigm shift as educators began to move away from a more traditional teaching model to that of increasingly incorporating mobile applications into their classrooms. This paradigm shift affected how educators approached the teaching process, in that they had increased access to educational technological resources that could be implemented in their classrooms.

In 2013, Karsenti and Fievez conducted a survey of 6,507 students and 302 teachers in Quebec, Canada, to examine the uses, benefits, and challenges of iPads in education. The purpose of the study was to demonstrate that schools take a necessary risk when implementing iPads into schools: although these powerful devices are full of potential for enhancing the cognitive skills of students, there are many challenges related to the implementation process. The guiding research considerations addressed the iPad as:

- being a catalyst for educational change,
- being a means of improving unsuccessful educational practices,
- capable of reducing school dropout rates,
- adversely impacting school-home life in relation to time limits placed on iPad usage, and
- a tool for equalizing learning opportunities for disadvantaged students or a tool that widens the gap between the digital “haves” and “have nots.”

In having students and teachers complete the survey, Karsenti & Fievez (2013) found the implementation of iPads in schools to demonstrate benefits in fifteen areas:

1. increased student motivation,
2. greater access to information
3. portability of the device,
4. ease of note-taking,
5. ease of organizing work,
6. quality of students’ presentations,
7. quality of teachers’ presentations,
8. greater collaboration among students, as well as between students and teachers,
9. more creativity,
10. variety of resources used, such as videos, images, applications, etc.,
11. students can work at their own pace,
12. development of students’ IT skills,
13. development of teachers’ IT skills,
14. improved reading experience, and
15. reduced paperwork for teachers.

Comparatively, challenges were noted in nine areas:
1. diverted attention as students had access to networking applications,
2. difficulty writing lengthy texts,
3. iPads did not make learning how to write easier,
4. some of the textbooks were incompatible with the iPad,
5. teachers experienced difficulty transitioning from a traditional textbook to the iPad,
6. teachers expressed increased difficulty in organizing student work due to multiple mediums being used to record student progress,
7. teachers were poorly informed about available resources on the iPad,
8. ebooks were underused, and
9. the academic performance of students distracted by the iPad was impacted negatively (pp. 38-39).

Based on these findings, the researchers made several recommendations:

**Teachers:** Specifically, the researchers cited the best teachers as using a varied approach to teaching as they used both digital and non-digital learning tools in their classrooms. They proposed that schools provide teachers with advanced training in iPad usage, as well as networking opportunities in which they could join with fellow educators in learning how to better implement iPads in their classrooms. In addition, they suggested that teachers would benefit from an understanding of the benefits and challenges of using an iPad in classroom management.

**Students:** Further training on digital citizenship was recommended for students to aid them reaching their maximal learning potential when using the iPad: while students may seem technologically savvy in many ways, they may also lack in understanding how to effectively use mobile technologies to gain deeper learning experiences that will enhance their overall cognitive development. With regard to electronic books in particular, the authors noted a lack of student participation in reading activities in and outside of the classroom. In response, they encouraged the promotion of conducting reading activities via an iPad, which could foster a resurgence in reading for students.

**Textbooks:** As implemented in the classroom, iPads have many benefits to both the teachers and students; however, research findings indicated that it was very important for textbooks to also be both relevant and accessible at all times. Further noted was that certain textbooks were deemed to be more engaging than others, and that educators needed to take this in consideration when selecting course materials.

**Parents and Developers:** Next, schools were challenged to raise parental awareness on the potential educational benefits and challenges of iPad use in the school and home setting in order to form a cooperative approach to addressing challenges with iPad use. Noted challenges could be further addressed by application developers as they mindfully consider the educational concerns voiced by school administrators, teachers, and parents.

**Research:** Even more importantly, the authors recommended further research on the implementation of iPads into schools, to better understand the benefits and how challenges could be overcome for students, teachers, and other educational stakeholders.

**Vision for Continued Integration:** Finally, the recommendation was made for “government agencies and teacher training educators to provide current and future teachers with a coherent and accurate vision of how mobile technologies such as the iPad can contribute to the school’s mission: to provide instruction, socialize and provide qualifications. Our teachers of the future must be shown how these technologies can be integrated into training programs, and how they can play a role in achieving learning and competency objectives,” (Karsenti & Fievez, 2013, p. 43).

**iPads in Speech Therapy**

Closely following the lead of the educators, speech-language pathologists began to examine the benefits of incorporating the iPad into their therapy sessions with students. The integration of the iPad into classrooms appeared to have a significant influence, initially, on school-based speech-language pathologists (SLPs). The proximity of school-based SLPs to educators incorporating mobile technologies in the classroom acted as a catalyst for clinicians desiring to use the iPad as a teaching and learning tool in their therapy sessions.

During this introductory phase of the iPad into therapy, clinicians followed a similar model as established by most educational institutions, in that some initiated pilot programs for examining the uses of the iPad in therapy. For example, in the spring of 2011, Progressus Therapy participated in a national pilot study which proposed to examine how the iPad could be used effectively and efficiently by occupational therapists and speech-language pathologists employed in school and early intervention settings. They presented their findings in The iPad: Revolutionizing Speech-Language Therapy at the American Speech Language Hearing Association Convention (2011).

Progressus Therapy recruited 24 speech-language pathologists to participate in the study. Each participant was given an iPad, as well as $150 for the purchase of applications that could be utilized in therapy. In exchange, the clinicians were expected to participate in bi-weekly team meetings in which they reviewed:

- the App of the Week,
- questions relating to the iPad and/or apps,
- difficulties experienced with using the iPad effectively and efficiently,
resources available for enhancing iPad experiences;
• team sharing exercises, and

App Shares.

As defined, App Shares was an evaluative framework developed for assisting clinicians in examining mobile applications at a deeper level. The components of the App Share Framework consisted of

• app identification,
• app category,
• app description,
• iTunes rating,
• pricing,
• customization,
• target population,
• treated disorders,
• specific IEP goals addressed,
• example or activity, and
• overall impressions.

A graphic exemplar can be seen below:

<table>
<thead>
<tr>
<th>App</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>(Pick one) Educational Motivational Productivity</td>
</tr>
<tr>
<td>Description</td>
<td>Either your own, or from iTunes</td>
</tr>
<tr>
<td>iTunes Rating</td>
<td>(if applicable) - Average rating for ALL versions. (1-5 stars) Ex: 3/5 stars</td>
</tr>
<tr>
<td>Price</td>
<td>Price for the full version. Is there a lite (free) version available?</td>
</tr>
<tr>
<td>Customization</td>
<td>In what ways, if any, are you able to customize the app?</td>
</tr>
<tr>
<td>Target Population</td>
<td>Specific age range (ex. 3-5 years, El, preschool, elementary, etc.)</td>
</tr>
<tr>
<td>Disorders Treated?</td>
<td>(if applicable) Articulation, Fluency, Receptive/Expressive Language, Pragmatics, AAC, Voice, OT, PT, Dysphagia, etc.</td>
</tr>
<tr>
<td>Specific IEP Goals Addressed?</td>
<td>(if applicable) 1 or more goals. Can you tie it to the curriculum?</td>
</tr>
<tr>
<td>Example Activity</td>
<td>What do you use it for? Be specific in regards to the app.</td>
</tr>
<tr>
<td>Your Overall Impressions</td>
<td>Please include an overall impression of the app. You could also use the same information from this section to “review” an app in iTunes! Developers love this kind of feedback and it helps others to decide whether or not to purchase.</td>
</tr>
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Progressus Therapy iPad App Share Framework (2011)

The integration of the App Share framework on a bi-weekly basis encouraged clinician collaboration as they: shared their overall impressions regarding specific apps that were effective or ineffective with specific client populations, shared in problem-solving tasks for enhancing the quality of their treatment through apps, and demonstrated creativity as they determined how specific apps could be customized to meet the needs of various clientele.

At the conclusion of this process, Progressus Therapy researchers administered a survey to clinicians, students, and parents with questions ascertaining their perspective on the iPad being incorporated into therapeutic practices. Survey responses are outlined as follows:

Clinic Survey Response Summary
• 71% to 79% of clinicians utilized the iPad to treat speech, language, and pragmatic disorders.
• 93% of clinicians cited the iPad as increasing their opportunity to work on targeted goals outlined in the Individualized Educational Plan (IEP).
• 71% of clinicians did not participate in additional continuing education addressing iPad integration into therapy.
• 92% of clinicians were “satisfied” or “very satisfied” with using the iPad in therapy.
• The majority of clinicians spent $1.99 to $3.99 per app.

Student Survey Response Summary
• 70% of students reported extending considerable effort when using the iPad in therapy.
• 92% of students reported the iPad as primarily being used with sound production tasks.

Parent Statements
• “The iPad has enhanced the quality of my child’s therapy and engaged my child in a high level he had not experienced before. Based on that, he was able to really bond with his therapist and become open to learning” (p. 24).
• “We have found it so helpful that we went and purchased our own. The options are endless and my daughter uses her iPad on her own and quite frequently…I think it has benefitted my daughter beyond words and she can’t wait to go to therapy now!” (p. 25).
• “The iPad makes learning so fun! I wish there were learning tools like that when I was younger :) My son enjoys playing with the iPad and it has increased his concentration, hand/finger/eye coordination, memory and speech skills.” (p. 26).

Based on survey responses, the integration of the iPad into therapy was considered to have a positive impact on student motivation, engagement, speech development, hand-eye coordination, memory function, attention, task completion, goal carryover, and clinician-student rapport. Interestingly, the clinicians primarily focused on the use of iPad apps targeting sound production in students, with fewer therapists reporting using applications for addressing language impairments.

During the study, many of the clinicians (71%) did not seek out additional training for using mobile applications
in speech therapy. This may simply indicate that the participating clinicians were confident in the training provided through the pilot study: as mentioned, they had access to App Shares through bi-weekly meetings, as well as a shared website, iPad and Technology in Therapy Resource Center, which was made available to all Progressus Therapy employees following the study.

The prior case samples taken from The iPad in Education: Uses, Benefits, and Challenges – A Survey of 6,057 Students and 302 Teachers in Quebec, Canada and The iPad: Revolutionizing Speech-Language Therapy serve as exemplars of preliminary programs established to examine the uses of the iPad in both the educational and clinical context. As some of the earliest adopters of the iPad, these professional organizations pioneered the way for integrating mobile technologies into everyday teaching and learning practices conducted within the classroom and therapeutic setting.

**Theoretical Perspectives**

In keeping with best practices, it is important that our therapeutic approaches be supported by research. The theoretical perspectives of social constructivism and activity theory are considered appropriate frameworks for examining best practices in technology integration within the therapeutic context.

Socio-constructivism is a theoretical perspective that situates cognitive and language development within the context of socio-cultural influences and social interactions; as such, it is instrumental in its ability to address clients’ language development within the context of clinician-directed interactions. Activity theory then provides a means of explaining language development as mediated through the use of a physical tool, e.g. iPad (Vygotsky, 1978).

Together, these perspectives address how technologies should be incorporated, i.e. in collaboration and not isolation, which has better outcomes for children.

**Socio-constructivist Theory**

The concept of social constructivism was first introduced by Lev Vygotsky (1978) in his contention that language processes developed within the context of social interactions. Vygotsky (1978) proposed that language was accommodated through socio-cultural context, interpersonal interactions, and intrapersonal influences on one’s own development.

The socio-constructivist framework may be characterized by internal and external influences that may either detract from or enhance the mediated learning experiences of individuals (Anderson & Dron, 2011). For instance, speech-language pathologists are responsible for incorporating best practices into their evaluative and treatment processes for clients. Best practice would indicate careful consideration of the specific technological tools and applications to be utilized in therapy with individual clients. Factors such as the client’s age, diagnosis, type and level of impairment, would need to be accounted for as the clinician determined the most appropriate technological tool or application for addressing targeted goals with each client. Furthermore, it would be remiss of the clinician to not examine the advantages and disadvantages of each tool as he or she is determining its level of fitness for a specific client.

Importantly, the clinician must demonstrate careful consideration of the technological applications to be employed in therapy sessions, and how he or she can leverage these tools to facilitate shared experiences resulting in optimal outcomes for clients. According to Vygotsky (1978), these shared experiences are a salient practice in the development of language in children. The clinician plays an integral role in fostering a rich language learning environment for clients as he or she selects technological applications that enhance communicative interactions between the clinician and client, and that integrate both the clinician and client into the activity. Explicitly stated, client use of technological tools such as the iPad in non-shared experiences does not constitute best practices for technology integration into therapy practices (National Association for the Education of Young Children & The Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College, 2012).

As cited in the American Academy of Pediatrics (2016), adults should be mediating the learning experiences of children to high-quality content. Mediated learning experiences occur through the guidance of a more knowledgeable person as he or she directs the learning process of the child.

<table>
<thead>
<tr>
<th>Mediated Learning Experiences</th>
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<tbody>
<tr>
<td><strong>Definition</strong></td>
</tr>
<tr>
<td>MLE is similar to coaching</td>
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<tr>
<td><strong>Goal</strong></td>
</tr>
<tr>
<td>To develop a more skilled</td>
</tr>
<tr>
<td>and independent learner</td>
</tr>
<tr>
<td><strong>Occurrence</strong></td>
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<tr>
<td>When a more skilled person</td>
</tr>
<tr>
<td>assists a child to grasp</td>
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<tr>
<td>something that he/she could</td>
</tr>
<tr>
<td>not learn independently</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
</tr>
<tr>
<td>To guide the child to</td>
</tr>
<tr>
<td>discover his/her own strategy for learning</td>
</tr>
<tr>
<td><strong>Strategy</strong></td>
</tr>
<tr>
<td>A mediator does not always tell the child what strategy to use</td>
</tr>
<tr>
<td><strong>Zone of Proximal Development</strong></td>
</tr>
<tr>
<td>The range of abilities a child can complete with assistance, but not independently</td>
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Figure 1: Model of Mediated Learning Experiences. Adapted from Vygotsky (1978: 86).

The key features of mediated learning experiences consist of reciprocity, intent, meaning and transcendence.

The foundational element for initiating mediated learning experiences is found in the feature of reciprocity, which
involves a responsive relationship between the child and mediator. This responsibility is based on a shared culture that follows established guidelines and routines in order to develop a working relationship between the child and mediator. The working relationship is further enhanced through shared trust, acceptance, and understanding, which promote the client’s receptiveness to learning through guided interactions (Vygotsky, 1987). For clinicians, the promotion of reciprocity can be established by the following means:

- Emphasizing order and patterns to assist children to discover relationships between events and tasks
- Establishing routines to set a safe and predictable learning environment
- Sharing an understanding of the purpose of therapy
- Modeling acceptance, trust and empathy
- Attending to the changing needs of your client

As previously stated, reciprocity acts as a precursor for the remaining components of mediated learning experiences.

The next focal point of mediated learning experiences addresses the area of intent. Intent refers to a clearly defined goal that is shared between the mediator and client. This shared ownership of intent is meant to provide the client increased awareness and responsibility for attaining a specific goal. However, the mediator is responsible for determining how to best engage the client for attaining the shared goal. Furthermore, it is imperative that the clinician continually examines the developing learning needs of clients to determine the most efficacious approach to attaining targeted goal(s). Examples of developing intent would include:

- Participating in shared attention activities
- Explicitly stating what is going to happen
- Assessing the client’s needs and perspective to select a shared activity
- Exhibiting excitement about the learning activity

Next in our sequence is the development of meaning for the learner. Within this context, the mediator or clinician is responsible for providing the client with relevant and meaningful learning experiences that can be related to everyday occurrences. Shared activities need to be interesting, important, and useful to the client. Examples of meaning development would be:

- Adjusting the difficulty of activities to match the child’s needs and interests
- Encouraging the continuation and completion of activities
- Not only praising the client for achievements, but explaining why he or she deserves praise
- Ensuring the new learning activity is connected to some aspect of the child’s worldview and experience

The final component of mediated learning experiences is that of transcendence. Transcendence refers to expanding the child’s understanding as he or she is able to transfer learned information from one context to another.

Clinicians can foster transcendence in their clients by:

- Questioning clients about how they will complete a task, and why they chose the steps they did for completing the given activity
- Helping children relate current activities to other real-life experiences (bridging)
- Modeling problem-solving as you talk aloud about the steps you are using to solve a current problem

In summation, mediated learning experiences stress the necessity for a high level of interaction as the clinician facilitates the learning process of his or her client. In using best practices for implementing technology into therapy, it is imperative for clinicians to adopt a mindset that promotes shared experiences in which the clinician is mediating the learning of the client. Expressly, this mindset may require a qualitative shift for therapists as they transition from allowing clients to use the iPad with limited monitoring and interaction with the treating clinician and/or only using the iPad as a reward for good behavior. As clinicians develop their skills for fostering shared learning experiences with clients, they will begin to align with best practices for effectively implementing technological tools into their clinical practices.

**First Generation Activity Theory**

Stemming from the work of Lev Vygotsky, Aleksei Leontiev (or Aleksei Leont’ev), and Alexander Luria, activity theory was introduced as a means of explaining cognitive development within the context of mediating factors directing learning through the use of psychological tools or signs (Vygotsky, 1978). This first generation model of activity theory introduced the concept of activity being directed through the use of psychological tools mediating the interactions between the individual subject and object (Luria, 1976; Vygotsky, 1978).

As an example, language can be categorized as a mediating tool which human beings utilize as a means of exchanging ideas, thoughts, and knowledge with each other as they have a shared symbol system for communication. In this instance, language is acting as the mediating factor in that individuals are able to use it as a conduit to share knowledge that can advantageously influence the thinking patterns of individuals (Vygotsky, 1978).

In applying activity theory to technological tools, the mediating factor may be that of the iPad facilitating (language) interactions between users. Expressly, this mode of communication functions at the fundamental unit for structuring communication exchanges. In addressing this fundamental requirement, speech-language pathologists often provide clients with the technological equipment, i.e. iPad, required to participate in online interactions. In this example, the iPad would be identified as the tool mediating between the subject and the object (Vygotsky, 1978).
Second Generation Activity Theory
The first generation of activity theory emphasized the individual actions of participants within an activity system through the use of mediating tools: Vygotsky (1978) did not address the capability of mediating tools to be utilized by other persons, outside of the individual participant, to direct the activity of the individual participant. The concept of mediating tools being utilized within a cultural-historical context that allowed for the other human beings to guide the activity of individuals was accomplished through the work of Leont’ev (1978). Thus, the second generation of activity theory focused on the collective activity of persons within an activity system (Leont’ev, 1978).

During the first generation of activity theory, Vygotsky (1978) introduced a triangular model of activity theory that depicted the interaction between the subject and object through the use of mediating tools. Although Leont’ev (1978) failed to graphically expand Vygotsky’s original model, he did provide a conceptual framework that addressed activity occurring within the context of a collective group. In doing so, he extended activity theory to include the structural components of rules, community, and division of effort. In integrating these components, Leont’ev (1981) expanded the capability of activity theory to address activity within the framework of a collective group, not only those activities carried out by the individual person.

In 1999, Yrgo Engestrom expanded the original triangular model introduced by Vygotsky to include the conceptual framework addressed by Leont’ev in his seminal research on the collective activity system. The following triangular representation of activity theory in Figure 2 includes terms, which are detailed in a summary to follow.

As referenced in Figure 2:
- the subject constitutes the person,
- the object consists of the immediate goal or objective,
- the artifacts represent those items mediating between the subject and the object,
- the outcome is an indication of overall success,
- rules are the established guidelines influencing the type of artifacts that may be used by the subjects,
- the community represents the immediate and extended community that can influence learning, and
- the division of effort indicates how labor is distributed among group members (Barab, Barnett, Lynch-Yamagata, Squire, & Keating, 2002).

The given exemplar is meant to reflect the perspective and agency of the client, and the speech-language pathologist to a lesser degree, within the context of a therapeutic setting. As outlined:
- the client and clinician are representative of the subject,
- the objective being to complete a shared or non-shared task or product,
- the outcome possibly being achievement of a targeted goal, such as improved production of the /s/ phoneme,
- the remaining factors (artifacts, rules, community, division of effort) acting as mediators between the subject and objective.

This multi-component theory can also be applied to view the clinic, school, etc. as the subject under inspection. At the organizational level, the objective might be adapted according to rule- and community-based mediators that may act as determinants of which technological tools may be utilized by the clinician and client based on the success rate of using a given tool. When considering the speech-language pathologist as the subject, the clinician may have the express goal of utilizing a therapeutic approach that is in alignment with best practices and conducive to producing positive learning outcomes in the immediate and successive time periods leading to goal mastery. The mediating factors between the clinician and the ultimate goal may be that of incorporation of best practices, autonomy in selecting technological applications, available technological tools, etc.

The dynamicity of activity theory accommodates for multiple levels of subjects or groups with shared or differing goals and mediating factors influencing the outcome. For our discussion, we will assume a shared goal of implementing best practices for producing positive speech-language outcomes in our clients through the use of the iPad as a mediating tool.
Becoming Critical Consumers

The previously-discussed theoretical perspectives of social constructivism and activity theory are considered appropriate frameworks for examining best practices in technology integration within the therapeutic context, helping to provide us with guidance and support for our implementation of apps in therapy. In the merging of theory and practice, we will next review three resources that will assist us in becoming critical consumers of technological applications. The assessment tools to be presented are Rate That App, the Fives Criteria, and the Virtual Speech Center Evaluation Rubric.

Each of the evaluation rubrics demonstrates alignment with best practices in technology integration through the incorporation of assessment indicators for:
- clinician-mediated learning experiences,
- selection of mobile learning applications,
- critical assessment of mobile application performance over time,
- level of engagement,
- educational relevance,
- operational functionality,
- level of accessibility,
- adaptability; and

The Rate That App tool was developed by Deb Tomarakos in 2012. The Rate That App guideline is a four-part rating system that assesses an application’s general information and operation, features, design, and speech-language use.

The General Information and Operation section considers the appropriateness of the content, app pricing, ease of use and dependability, in-app pop-ups, and more. Features addresses app customization capabilities, single- or multi-user component, in-app data collection, exportation of content, etc. The App Design category examines the visual and audio appeal of a particular app, its level of interactivity and engagement for clients, as well as its ability to promote creativity in a client. The last component is the app’s Speech-Language Use, which assesses if the app was originally designed for addressing speech-language skills, the adaptability of the app to address speech-language concerns, whether it is appropriate for facilitating interactions between the clinician and client, as well as whether it is able to encourage higher-order thinking and language skills.

A representation of Deb Tomarakos’ Rate That App rating system is depicted below in Figure 3.

Figure 3: Outline of Rate That App. Adapted from Tomarakos (2012).
The next assessment tool we will look at is the *FIVES Criteria* developed by Sean Sweeney in 2013. There are many mobile learning applications that were not originally designed to address the needs of children with speech-language disorders; however, many of these applications are capable of being adapted to meet the needs of the given population. The *FIVES Criteria* was created to assist speech-language pathologists in selecting technological applications that are adaptable to the individualized needs of their clients.

The *FIVES Criteria* provides a quick, easy, and memorable means of examining whether given mobile learning applications are appropriate for a client. *FIVES* is an acronym for fairly-priced, interactive, visual, educationally relevant, and, well, “speechie.” To further explain, clinicians need to determine if a mobile application is *Fairly-Priced* as they consider the app’s design and usability, flexibility, and permanence. *Interactive* technologies go well beyond rote tasks, as demonstrated in computerized drilling games, by incorporating critical thinking skills, creativity, problem-solving, and language processes. *Visual* technologies provide clinicians with a visual tool to enhance their clients’ ability to learn abstract concepts. *Educationally relevant* materials coinciding with classroom topics can be incorporated into therapy sessions to facilitate deeper learning for our clients. *Speechie* references a particular mobile application’s ability to address the speech-language needs of a client: speechie mobile applications address areas related to vocabulary, grammar, sentence production, auditory processing, sound development, etc.

A representation of Sean Sweeney’s *FIVES Criteria* is depicted below in Figure 4.

**The FIVES Criteria**

![FIVES Criteria Diagram](image)

Figure 4: Graph of the *FIVES Criteria*. Adapted from Sweeney (2013).

Finally, the *Evaluation Rubric for Speech Therapy Apps* was developed through the Virtual Speech Center by Beata Klarowska (2013). Similar to the *Rate That App* star rating system, Klarowska developed a grading scale ranging from 1 to 5 stars with a rating of 5 stars being the highest. For this evaluation rubric, importance was given to the following components: evidence-based practice, visual appearance, flexibility, number of activities, number of flashcards (if any), audio recordings, fun for children, and reporting capabilities.

A representation of Beata Klarowska’s *Evaluation Rubric for Speech Therapy Apps* is depicted below in Figure 5.

### Evaluation Rubric for Speech Therapy Apps

<table>
<thead>
<tr>
<th>Grading</th>
<th>Excellent - 5 stars</th>
<th>Good - 4 stars</th>
<th>Fair - 3 to 2 stars</th>
<th>Poor - 1 star</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-based practice</td>
<td>The app definitely supports evidence-based practice and provides research references.</td>
<td>The app supports evidence-based practice but does not provide any research references.</td>
<td>The app somehow supports the research.</td>
<td>The app does not support evidence-based practice and is not developmentally appropriate.</td>
</tr>
<tr>
<td>Visual appearance</td>
<td>The graphics are clear, organized, and appealing. There are no ads.</td>
<td>The graphics are organized and somehow appealing. There are no ads.</td>
<td>The graphics are disorganized and not very appealing, or there may be some ads.</td>
<td>The graphics are disorganized and not very appealing. There are ads.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>1. The app includes settings that can be changed, e.g., turn on/off audio recording.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The app supports group therapy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The app allows replay of audio instructions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The app provides feedback re: correct and incorrect responses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The app allows for automatic and manual scoring.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. The app allows the user to audio-record and play students' responses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The app includes settings that can be changed, e.g., turn on/off audio recording.</td>
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<tr>
<td>2. The app supports group therapy.</td>
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<tr>
<td>3. The app allows feedback re: correct and incorrect responses.</td>
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<tr>
<td>4. The app can automatically score.</td>
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</tr>
<tr>
<td>5. The app allows the user to audio-record and play students' responses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Number of activities | The app provides three or more types of activities for the particular targeted area, e.g. flashcards, memory game, spinner, story, etc. |
| The app provides at least two activity types for the particular targeted area, e.g. flashcards, memory game. |
| The app provides one activity type for the particular targeted area, e.g. flashcards. |
| N/A |

| Number of flashcards (if any) | The app offers a great selection of flashcards. |
| The app offers a reasonable number of flashcards. |
| The app offers a limited number of flashcards. |
| The app offers very little flashcards. |

| Audio recordings | The app includes high-quality and professional audio recordings: precise articulation, intonation, and appropriate rate of speech. |
| The app includes high-quality and professional audio recordings: precise articulation, intonation, but increased rate of speech. |
| The app includes somehow high-quality audio recordings, but the articulation/intonation is less precise and/or the rate of speech is too rapid. |
| The app does not include high-quality and professional audio recording, or the articulation/intonation is not precise, and the rate of speech is too rapid. |

| Fun for children | The app is child-friendly and offers some gaming component or rewards. |
| The app is child-friendly and offers a reward system. |
| The app is child-friendly, but the child may get bored easily. The app does not offer any reward system or game. |
| The app is not child-friendly, and does not offer any fun activity. |

| Reporting | The app provides detailed reports with graphs or tables. The reports are recorded for all students and can be viewed by student/date/goal. The reports are saved and available for later viewing. The report can be emailed. |
| The app provides detailed reports with graphs or tables. The reports are saved and available for later viewing. The report can be emailed. |
| The app provides reporting, but it is not detailed, or reports cannot be saved or e-mailed. |
| The app does not provide reporting. |

Figure 5: Graph of the Evaluation Rubric for Speech Therapy Apps. Adapted from Klarowska (2013).
The above-stated components exhibit similar characteristics to those examined by Rate That App and the FIVES Criteria in that they address mobile applications’ visual appearance, flexibility, interactivity, and customizability. In addition, the Evaluation Rubric for Speech Therapy Apps further considers evidence-based practices for selecting mobile learning applications, the number of flashcards on an app, and reporting capabilities. Overall, the rubric provides an excellent rating system for app selection; however, this author is in disagreement on the importance of the number of flashcards on a given app. As noted in the FIVES Criteria, clinicians utilizing apps in a drilling method does not allow for interactivity between the client and the mobile application. Best practices in incorporating mobile technologies into therapy stress the importance of interaction between the client and mobile application to the development of deeper learning.

**Moving Clients from Passive Consumers to Knowledge Producers**

In facilitating deeper learning, it is imperative that we spur our clients to move beyond being passive consumers of technology, and to instead become knowledge producers.

For the purposes of this course, “passive consumption” is defined as technologies that have an effect on clients. Examples of passive technology consumption would consist of watching digital content produced by others, performing “drill-and-kill” practice sets, completing digitized worksheets and quiz-based digital games, and listening to and parroting back information presented on a mobile application. In these types of activities, very little information is retained in long-term memory, as the client has not constructed the knowledge for him or herself. Ultimately, learning is fundamentally an act of creation, not consumption of information (Hirsh-Pasek, et al. 2015).

Comparatively, “knowledge production” references technologies that reinforce the client’s interaction with the mobile learning application. These interactions allow the user to create meaning from the content. Specifically, active learning interfaces foster creativity, productivity, critical thinking, problem-solving, and language processes in a client. In other words, clients should be making things and connecting with others and exploring the world, rather than staring at screens. An example of incorporating active learning or knowledge production would consist of asking a client to critique his or her own grammar in an interactive mobile application, such as the Tell About This or Write About This app.

As we leverage learning technologies to develop critical thinking, creativity, problem-solving, productivity, and language processes in our clients, we are better preparing them for 21st century life and work.

Practically, we move clients from passive consumers to knowledge producers by fostering active learning experiences, engagement in learning, meaningful learning, and social interaction in our clients.

Clinicians should implement active learning experiences to transition clients from being passive consumers to knowledge producers. To quality as an active learning experience, children cannot simply tap or swipe, but rather must be “minds-on.” Tapping in response to something on a screen to make it rise is “minds-off,” but activities such as purposefully figuring out where a puzzle piece goes or creating a story board can constitute a “minds-on” activity. Learning is not simply a passive registration of information, nor is it simply a result of any type of physical activity. Learning that “sticks” requires active, “minds-on” learning.

Deeper learning is further experienced through the client’s engagement in the learning process as facilitated by the clinician. Engaging children in the learning process is critical to their ability to stay on task and learn the targeted information. Research has classified student engagement as falling within three categories: behavioral engagement (rule-following, effort, persistence, participation in programs), emotional engagement (affective reactions), and cognitive engagement (investment in learning, flexibility in problem-solving). We need to be careful that we're not disrupting the child's engagement by selecting apps that have extraneous animations and sound effects.

**Meaningful learning** is sustainable and useful learning derived from experiences that connect to our existing knowledge. A number of apps require shallow, rote memorization, which is a poor example of meaningful learning. A positive example would be an app that engages the child and parents in language activities around the home using the device’s camera. The child would then connect his or her prior learning experiences from the home to the app being used in the therapy session as well.

**Social interactions** are critical for language development in children. Social contingency in particular is a key factor in learning. That is, when a back-and-forth cycle is established between two speakers, in which the reaction of one speaker is in response to the other, powerful learning can occur. Importantly, apps can allow for parents, clinicians, and peers to collaborate when using them, which is incredibly important for the learning process (Hirsh-Pasek, K., et al., 2015).

**Screen Time Standards**

Discussions of the influence of mobile learning applications on cognitive development, while valuable, are beyond the scope of this course. That said, before introducing the mobile learning applications, it is important to review screen time standards for children.
As defined, “screen time” consists of any time spent in front of a screen with a television, mobile phone, tablet, computer, or iPad constituting a screen. According to the American Academy of Pediatrics (2016), children’s media use should incorporate the following recommendations:

1. 18 months and younger – limit screen time to video chatting, i.e. Facetime.
2. 18 to 24 months – limit screen time to high-quality programming viewed with parent(s) mediating learning experiences
3. 2 to 5 years – limit screen time to 1 hour per day with same rule application as prescribed for 18 to 24 months.
4. 6 years and older – parent-based time restraints on screen time with monitoring of types of media children are accessing. Ensure that media is not replacing sleep, physical activity, and other behaviors essential to health.
5. Schedule media-free times and media-free zones, i.e. driving, dinner, etc.
6. Consistent discussions on online citizenship and safety, i.e. etiquette and netiquette.

These recommendations should be taken into consideration when implementing technologies into therapy. Also, clinicians should educate parents on how they can best engage their children while using learning technologies.

Mobile Learning Applications

The remainder of the course will highlight a variety of mobile learning applications that demonstrate characteristics falling within the afore-discussed guidelines for best practices. (NOTE: These apps are presented as examples only. No endorsement is intended or implied.)

The first two apps to be introduced are the Tell About This and Write About This app collections. These particular apps provide clients with a visual and verbal prompt to elicit a story narrative on a chosen topic.

Additionally, clinicians and clients have the option of clicking on the Create a Prompt tab, in which they can take their own pictures and create a unique story prompt. As depicted below, the clinician and/or client can create a new story prompt by taking a Photo or selecting one from the Photo Album.
Below you can see a picture taken by the author outside of her home. After taking the picture, the author added the story prompt “What does a plant need to grow?” in the Add Text box section.

Following this process, clinicians and clients are able to customize their own story prompts.

Now let’s return to story prompts that are readily available on the Tell About This app. For this example, the author will select the Learn tab. Within this icon, the client or clinician has a myriad of topic choices to select from in picture form.

After completing these steps, the client or clinician can record the verbal prompt for the picture before saving it. After the story prompt is saved, it is placed in the customization section of the app.
As selected, this story prompt asks “What’s it like to go to school?” If the client is unable to read, then the app has a reading component that is activated by touching the story prompt question.

For this app, the author likes to provide clients with additional time to consider the question prior to recording their response. When ready, clients can record their responses to the question and play back the recorded response for self-evaluation purposes. This allows for clients to re-record their responses until they are satisfied with the final outcome.

Afterwards, clients are able to save their responses under the Choose Author section of the app. Clinicians can use this section to create client profiles and maintain records of their progress. To maintain the Health Insurance Portability and Accountability Act (HIPAA), clinicians should not use the real name or pictures of clients in this section.

Recordings are saved in the My Tell Abouts section with the clinician being able to organize recordings based on client profiles. Furthermore, clinicians are able to share these recordings via email with parents as well.

Author’s Feedback: I have used the Tell About This app to improve language skills relating to:

- grammatically correct sentence structures,
- self-correction skills,
- novel vocabulary,
- answering who, what, where, how, and why questions (wh-questions),
- hypothetical reasoning,
- verbal reasoning, and
- storytelling skills.
Write About This was created by the same developers as Tell About This, with the same approach in that they utilized a visual and verbal prompt to elicit a story narrative on a chosen topic. The difference was their transition from an activity focusing on verbal expression to one that focused on written expression in describing a picture.

As in the Tell About This app, the Write About This app also includes readily available story prompts, as well as an option for one to create his or her own prompts. For this example, we will use a story prompt created by the developers by going to the Search section.

In the search component, you can either choose from the list of topics presented on the initial page or you can search for story prompts on a particular topic of interest. For our interests, the “Name all the things you can do or make with an apple that you can think of” was chosen.

The Write About This app’s major difference from the Tell About This app is related to the Write icon. Once the Write icon is selected, the user can write his or her response to the social story prompt. For this example, the author has completed a written response to the story prompt below. The Record Audio tab is an additional component allowing the writer to verbally record his or her written response.
The clients' responses can then be saved into their respective user profiles and shared with family members.

Author's Feedback: The Write About This app is a great tool for addressing:

- grammatical sentence structures,
- deductive reasoning tasks,
- categories,
- vocabulary,
- perspective-taking,
- reasoning skills,
- comparative statements,
- hypothetical questions,
- similarities and differences,
- personal safety,
- memory function,
- sentence completion, and
- inferences.

Next, Imagistory is an example of a digital story telling app which requires clients to provide “voice-over” for a story depicted using visual scenes only. The caption underneath the title stresses “creating & recording stories together,” which is in alignment with the best practice of learning taking place through social interactions. (Typically, the author will prep clients by reviewing the story, then take turns with the client in completing voice-over during the recording process.)

However, Imagistory also has an option for users to listen to pre-recorded voice-overs of selected stories under the Listen tab.
To begin, the clinician or client can choose the story that he or she would like to complete voice-over for. For the purposes of this course, the author selected “The Bubble Monster” story in an abbreviated form.

Similar to the prior mobile applications, Imagistory allows the client to listen to his or her recorded story prior to saving it. Also, Imagistory has sharing capabilities that can enhance collaborative efforts between clinicians and parents.

**Author’s Feedback:** Imagistory is a great resource for developing:
- creative thinking,
- perspective-taking,
- vocabulary,
- action verbs,
- simple and complex sentence structures,
- predictions,
- feelings,
- pronouns, and
- descriptive phrases.

Imagistory is only one example of a digital story telling app, as there are a myriad of mobile applications focusing on this targeted learning area.

**iRead With Curious George**
For example, the iRead With Curious George – Animated Stories bundle offers a simpler digital story telling app for younger learners. This particular app puts less of a burden on young learners, as they are able to pre-record their voice for targeted words prior to reading the story. Once their voice has been recorded, it will automatically play in the story.
Squigglefish
Another great resource for younger learners is Squigglefish, which is an example of augmented reality. Simply, augmented reality enhances the user’s real-life experiences through a computer-generated image. In Squigglefish, the user is able to take a picture of a real object, i.e. fish, with the object being projected onto the iPad screen.

The first screen will be a blank canvas, unless you have fish stored from a prior session. In the upper left corner, the user will see a fish with a plus sign in the center of it. On clicking this icon, the user will be prompted to take a photograph of drawn fish.

For this demonstration, the author used a fish she drew using a black sharpie.

The “black outline” step is paramount: your fish will not be detected by the Squigglefish app if it is not bordered with a black sharpie. Within the black borders, the client is free to be creative in his or her design of the fish.

Once the client is satisfied with how the fish looks, then he or she can take a picture of the fish using the iPad. Once this is completed, the fish will automatically appear in the Squigglefish app.

The icons at the bottom of the screen allow the client or clinician to change the displayed side or direction of the fish, as well as delete unnecessary fish cluttering the visual landscape of the tank.

**Author’s Feedback:** Squigglefish is a great app for addressing:

- colors,
- size,
- shapes,
- descriptive statements,
- directions, and
- positional statements.
Animal 4D+
Another great example of augmented reality in action is the Animal 4D+ app.

The app itself is free; however, the user must order the Animal 4D+ cards online with the app accessing your location to determine the nearest vendor. (On a personal note, it is fairly easy to locate and download free Animal 4D+ cards online as well.)

These examples of augmented reality allow the world to become more alive to clients using a digital platform.

**Author’s Feedback:** The Animal 4D+ app is an excellent resource for addressing:
- phonological awareness,
- vocabulary,
- articulation,
- wh-questions,
- object description, and
- object function.

What’s more, 4D+ developers have created an additional bundle of related apps, such as Dinosaur 4D+ Animal Zoo, Octaland 4D+ and more.

**My PlayHome**
The next mobile application to be highlighted is the My PlayHome app, which allows children to have a digital play experience using real-life scenes depicted in the app.

Once the user has accessed the Animal 4D+ cards, he or she will hold the iPad over the card, and the iPad will generate a 4D model of the object. For this discussion, the author utilized two sample cards downloaded directly from the Internet. The subsequent 4D+ models were generated on holding the iPad over each picture.
The user begins by choosing a scene. For the current example, the author selected the children’s bedroom scene.

In the upper right corner, the user can select from multiple characters by touching the desired icon. In this scene, the author selected the boy, girl, and baby. If the user prefers a wider range of selection, he or she may click on the furthermost green icon and choose from additional characters. (In this section, the clinician could address areas relating to sound production, labeling, phonological awareness, prepositions, and descriptors.)

The user now decides what each character is doing in the scene. The author placed the characters in their respective beds to sleep for the night. (In this scene, the clinician could address bed time routines, opposites, time concepts, and actions.)

Another scene depicts the family sitting around the table for breakfast before beginning their day. As in the previous example, clinicians and clients have the capability of creating different moments within each scene, as they control the objects within it. In this scene, the author provided each character with something to eat and drink, as well as seated them in their respective positions. In the live scenario, the participant would realize that the washer is in spin cycle at this time, and that there are eggs frying on the stove as well.

The user can also create an update to the scene. The author clicked on the “sun” icon and dressed the children for the day. (In this scene, clinicians could address morning routines, clothing labels, descriptors, and predictions.)
Additional scenes from the *My PlayHome* app include the following:

The final picture depicts the *My PlayHome* app leading into the *My PlayHome Stores* app. Notably, the *My PlayHome* app offers additional learning options by seamlessly connecting social scenarios using *My PlayHome Stores, My PlayHome School*, and *My PlayHome Hospital*.

**Author’s Feedback:** These mobile applications are considered to be an excellent resource for establishing and teaching:
- social stories,
- social routines,
- social language,
- prediction-making,
- actions,
- plurals,
- quantitative concepts,
- gender,
- sequencing,
- following directions,
- object identification,
- opposites, and
- qualitative concepts.

The author has also found them to be highly engaging and interactive for her clients.
Superhero HD
Another favorite mobile application is the Superhero HD app, which was created by the developer Duck Duck Moose. Superhero HD is an app that allows children to create a comic book.

In the lower right corner, users have the option of creating a comic book from given scenes or using a coloring book type method to create a story.

To create a comic book story through a given scene, the user can take the following steps:

1. Select a scene from the given options under the Comic maker icon. The author chose to select the iconic Golden Gate Bridge.

2. Select icons to populate the scene, creating the desired story line. The author selected the given icons to depict an epic smackdown between the resident superhero and local monsters attacking a food truck.
As viewed below, the user can provide voice over for the given scenes, as well as act out the story scene by moving the icons around during the recording process.

On selecting the *Coloring* icon, users are introduced to an array of coloring book options.

For this course, the author selected a picture depicting a single-tooth, but happy, character taking a voyage through space.

The created scenes will display in the *My Comics* section where the user can play his or her created story for listeners.

A secondary component of *Superhero HD* is the coloring book option in which users can participate in a digital coloring activity.

Once the red drop tab is clicked in the upper right corner, the user is able to access color options for his or her picture.
As with the created comic scenes, the user can record a voiced-over story for the given picture.

Once the story is complete, the user can play back his or her created story. The coloring book may be a great option for younger learners, as it has lower cognitive and physical demands.

**Princess Fairy Tale Maker**

A companion app to *Superhero HD* is the *Princess Fairy Tale Maker* app, which was also created by Duck Duck Moose. The *Princess Fairy Tale Maker* functions in the same exact manner as *Superhero HD*, but instead of superheroes there are princesses acting as the main story characters.

For this app, the introductory page is dedicated to the user being able to create his or her own monster from a selection of icons in the *Add a Monster* section. Additionally, the app is intuitive in its ability to save prior sessions based on each user.

**Teach Your Monster to Read**

The final app to be discussed is the *Teach Your Monster to Read* app, which was developed by the Usborne Foundation. This interactive mobile learning app is basically an app that assists in the development of pre-reading and reading skills for young learners – cleverly disguised as a video game.

**Author’s Feedback:** These mobile applications are considered to be an excellent resource for establishing and teaching:
- colors,
- shapes,
- sequencing,
- storytelling,
- novel vocabulary,
- phonological awareness,
- sound production, and
- labeling.
The *Teach Your Monster* app has a wide range of teaching and learning options relating to pre-reading and reading skills. For this course, the author will focus on phonological awareness activities. In the below graphic, the user has the option of choosing from *letter sound matching games* and *blending and segmenting games*.

Furthermore, the clinician can choose specific sounds to target during the session with his or her client.

For each completed segment, the client obtains a given number of stars for each correct identification of the targeted phoneme.

For the given example, the author chose to target the /b/ and /t/ phonemes.

On completing each segment, the player is challenged with a more complex gaming level involving the targeted sounds.
Author’s Feedback: The Teach Your Monster to Read app is a fabulous resource for teaching:
- phonological awareness,
- sound-letter identification,
- rhyming,
- segmentation,
- blending,
- word identification,
- reading of simple phrases and sentences,
- reading comprehension, and
- following directions.

In addition, the video game feel is incredibly engaging for her clients.

In summation, the mobile learning applications discussed within the body of this course are characteristic of apps that are deemed to be within the scope of best practices for technology integration into therapy. Each of these mobile applications allow for:
- increased levels of clinician-client interaction,
- deeper learning experiences,
- client engagement,
- transitioning from user consumption to user production,
- active learning experiences,
- meaningful learning experiences,
- social interactions
- flexibility and customizability,
- intuitive software,
- visual and auditory stimulation,
- educational relevance, and
- adaptable technological tools.

Additional Resources

Even with an awareness of best practices, it can be daunting to sift through all the available mobile learning applications to select the ones that are appropriate for one’s clients. Fortunately, assistance is available.

Bridging Apps

An excellent resource for assisting clinicians in selecting appropriate applications for their specific clients’ needs is the Bridging Apps website (https://www.bridgingapps.org/). The Bridging Apps website is hosted by Easter Seals, which is a non-profit organization providing training, education, and professionally reviewed apps to help people with special needs use technology to reach their fullest potential.

In the Category section, users are able to further discriminate between applications using parameters to include the following categories:
- AAC/Communication
- Adults & Seniors
- Advocacy
- Behavior/Emotions
- English Language Learner
- Fine Motor Skills
- Fun
- Health & Wellness
- Holidays
- Language Arts
- Life Skills
- Math
- Multiplayer
- Multiple Languages
The Bridging Apps tool is a great resource for not only clinicians, but parents desiring to integrate professionally vetted apps for individuals with special needs.

Clearview Speech and Consulting Services Website
A second resource for the assessment of mobile learning application in speech-language therapy can be found through the Clearview Speech and Consulting Services website (http://www.clearviewspeech.com/).

On this site, mobile learning applications are reviewed by the author, a speech-language pathologist and child development specialist, along with an educational technology specialist.
Furthermore, this website provides users with opportunities for participation in free- and fee-based webinars addressing speech-language deficits in both children and adults.

Conclusion

The purpose of this course was to deliver a research-based approach to the identification and selection of mobile applications that fostered fun, engaging, and meaningful learning experiences for children. In qualifying developmentally-appropriate practices for mobile learning applications, readers were introduced to three assessment tools for examining the quality of given applications. In identifying appropriate mobile learning applications, the assessment tools reinforced the importance of an app’s visual appearance, flexibility, interactivity, customizability, educational relevance, and adaptability to speech-language therapy.

In becoming critical consumers of mobile learning applications, speech pathologists are able to move their clients from being passive consumers of technology to that of active learners producing knowledge through deeper learning experiences. The development of these richer learning experiences will allow clients to grow in creativity, critical thinking, problem-solving, productivity, social skills, and language development.

References


1. As of ________, portable tablets were identified as being implemented in classrooms daily in over 4.5 million schools. Specifically, iPads were identified as being the most prevalently used mobile technology device in the educational sector all over the world.
   a. 2011
   b. 2013
   c. 2015
   d. 2017

2. In 2013, Karsenti and Fievez conducted a survey of 6,507 students and 302 teachers in Quebec, Canada, to examine the uses, benefits, and challenges of iPads in education. Which of the following is NOT one of the benefits listed by the survey?
   a. Development of students’ IT skills
   b. Greater access to information
   c. Greater collaboration among students, as well as between students and teachers
   d. Increased ease in writing lengthy texts

3. In the spring of 2011, Progressus Therapy participated in a national pilot study which proposed to examine how the iPad could be used effectively and efficiently by occupational therapists and speech-language pathologists employed in school and early intervention settings. ________ of participating clinicians cited the iPad as increasing their opportunity to work on targeted goals outlined in the Individualized Educational Plan (IEP).
   a. 27%
   b. 52%
   c. 79%
   d. 93%

4. The concept of social constructivism was first introduced by ________ in his contention that language processes developed within the context of social interactions.
   a. Benjamin Bloom
   b. Erik Erikson
   c. Lev Vygotsky
   d. Yrgo Engestrom

5. In applying first generation activity theory to technological tools, the mediating factor may be that of ________
   a. The individual subject
   b. The individual object
   c. The iPad facilitating (language) interactions between users
   d. The structural components of rules, community, and division of effort

6. Although ________ failed to graphically expand Vygotsky’s original model, he did provide a conceptual framework that addressed activity occurring within the context of a collective group. In doing so, he extended activity theory to include the structural components of rules, community, and division of effort.
   a. Aleksei Leont’ev
   b. Alexander Luria
   c. Benjamin Bloom
   d. Erik Erikson

7. In the expanded triangular representation of activity theory put forth by Yrgo Engestrom, “_______” are the established guidelines influencing the type of artifacts that may be used by the subjects.
   a. Communities
   b. Divisions of effort
   c. Outcomes
   d. Rules

8. The Rate That App tool, developed by Deb Tomorokos, is a four-part rating system. Which of the following characteristics of an application is NOT assessed by Rate That App?
   a. Design
   b. General information and operation
   c. Number of activities available
   d. Speech-language use
9. As developed by Sean Sweeney, the “FIVES” acronym represents the following criteria for assessing apps:
   a. Fairly-priced, Interactive, Visual, Educationally Relevant, Speechie
   b. Fairly-priced, Intuitive, Variable, Educationally Relevant, Speechie
   c. Fairly-priced, Intuitive, Visual, Easy, Speechie
   d. Fairly-priced, Isolation, Visual, Eco-friendly, Speechie

10. The Evaluation Rubric for Speech Therapy Apps, developed through the Virtual Speech Center by Beata Klarowska, uses a grading scale ranging from 1 to 5 stars, with a rating of 5 stars being the highest. In the category of “visual appearance,” which of the following constitutes a 1-star rating?
   a. The graphics are clear, organized, and appealing. There are no ads.
   b. The graphics are disorganized and not very appealing, or there may be some ads.
   c. The graphics are disorganized and not very appealing. There are ads.
   d. The graphics are organized and somehow appealing. There are no ads.

11. Best practices in incorporating mobile technologies into therapy stress the importance of interaction between the client and mobile application to the development of deeper learning. Clinicians utilizing apps in a drilling method ________.
   a. Allows for interactivity between the client and the mobile application
   b. Does not allow for interactivity between the client and the mobile application
   c. Increases interactivity between the client and the mobile application
   d. Support best practices

12. Technology use with clients should be ________.
   a. Active
   b. Intermittent
   c. Passive
   d. Required

13. Examples of ________ would consist of (a) watching digital content produced by others; (b) performing “drill-and-kill” practice sets; (c) completing digitized worksheets and quiz-based digital games; and (d) listening to and parroting back information presented on a mobile application.
   a. Active technology consumption
   b. Best practices in technology consumption
   c. Excessive technology consumption
   d. Passive technology consumption

14. Meaningful learning is sustainable and useful learning derived from experiences that connect to our existing knowledge. An example would be ________.
   a. An app emphasizing rote memorization
   b. An app relying on tapping or swiping in response to something on the screen
   c. An app that engages the child and parents in language activities around the home using the device’s camera
   d. An app with superfluous animations and sound effects

15. According to the American Academy of Pediatrics (2016), at 2-5 years, children’s media use should be limited to ________.
   a. 1 hour per day of high-quality programming viewed with parent(s) mediating learning experiences
   b. High-quality programming viewed with parent(s) mediating learning experiences
   c. Video chatting, i.e. Facetime
   d. None of the above

16. The apps Squigglefish and Animal 4D+ are examples of ________ in action.
   a. Augmented reality
   b. Choosing specific sounds to target
   c. Digital coloring activities
   d. Rote memorization and drilling

17. The ________ app teaches phonological awareness; (b) sound-letter identification; (c) rhyming; (d) segmentation; (e) blending; (f) segmentation; (g) word identification; (h) reading of simple phrases and sentences, (i) reading comprehension, and (j) following directions. In addition, the video game feel is engaging.
   a. Imagistory
   b. My PlayHome
   c. Superhero HD
   d. Teach Your Monster to Read

18. ________ is an example of a digital story telling app which requires clients to provide “voice-over” for a story depicted using visual scenes only. However, it also has an option for users to listen to pre-recorded voice-overs of selected stories.
   a. Animal 4D+
   b. Imagistory
   c. My PlayHome
   d. Princess Fairy Tale Maker
19. Which app is considered to be an excellent resource for establishing and teaching (a) social stories; (b) social routines; (c) social language; (d) prediction-making; (e) actions; (f) plurals; (g) quantitative concepts; (h) gender; (i) sequencing; (j) following directions; (k) object identification; (l) opposites; and (m) qualitative concepts?
   a. Imagistory
   b. iRead With Curious George
   c. My PlayHome (and related apps)
   d. Princess Fairy Tale Maker

20. The _______ website is a resource for assisting clinicians in selecting appropriate applications for their specific clients’ needs. The clinician search for apps addressing targeted speech-language related concepts by completing a keyword search. Furthermore, clinicians can establish additional mobile application parameters.
   a. Bridging Apps
   b. Clearview Speech and Consulting Services
   c. Monte Vista
   d. Progressus Therapy
Best Practices in Technology Integration:
Assessing New Technology and Incorporating
Existing Technology into Therapy - Final Exam

1. A B C D  
2. A B C D  
3. A B C D  
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18. A B C D  
19. A B C D  
20. A B C D

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BEST PRACTICES IN TECHNOLOGY INTEGRATION: ASSESSING NEW TECHNOLOGY AND INCORPORATING EXISTING TECHNOLOGY INTO THERAPY (2 CE HOURS)

COURSE EVALUATION

Learner Name: ________________________________________________________ Completion Date: __________________

❑ PT  ❑ PTA  ❑ OT  ❑ OTA  ❑ SLP  ❑ SLPA  Other: ________________________________

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<tr>
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<th>Disagree</th>
<th>Agree</th>
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What suggestions do you have to improve this program, if any?
__________________________________________________________________________
__________________________________________________________________________

What educational needs do you currently have?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

What other courses or topics are of interest to you?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________