

Technology in Language Learning in Early Childhood Curriculum

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Abstract

The desire to communicate is one of the basic needs of human beings and we feel this need as soon as we step into this world. Language is the agent that helps us fulfil this need of ours and as we grow our language acquisition process is strengthened. One of the pillars of a good early childhood curriculum is the manner in which language development experiences are planned for a child—as the child learns the rules of the language without any formal instructions.

Technology has now found its place in the early education environment along with books, flannel boards, finger paints, markers, play dough, and other media. As a result, the use of technology in an early childhood setting requires that each of us, as early childhood educators, continue to learn as much as we can about technology issues and trends. Computers and Tablet PCs, along with developmentally appropriate software, interactive CDs, DVDs, and cassette tape audio recorders, can make a unique contribution to the education of young children. How appropriately technology is used is more important than just using it.

This paper presents examples of using technology appropriately in the language learning classroom by documenting various studies existing in the area. It also discusses how assistive technology can assist children with special needs as they strive to participate in a regular educational environment.

The paper also provides a checklist for early childhood educators and curriculum developers to decide on incorporating technological interventions so that learning experiences are augmented and also other child-related developmental activities do not take a back-seat.

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Introduction

Human communication works in an utterly unique way. The desire to communicate is one of the basic needs of human beings and we feel this need as soon as we step into this world. Language is the agent that helps us fulfil this need of ours and as we grow our language acquisition process is strengthened.

There are five components of a language that we make use of every time (1) *phonetics* – the component dealing with the sound system; (2) *orthography*–the component dealing with the rules of a spelling of a word; (3) *morphology*–dealing with the various word suffix and prefix; (4) *syntax*– dealing with the various grammatical structures; and (5) the component of *semantics* – dealing with the prevalent word usage.

Also every language is associated with four basic skills – *listening* to the utterances in the language, *speaking* that language, *reading* and *writing* in that language. We develop these skills in us from the time we are exposed to the various components of the language in our childhood. These four skills – also classified as *expressive language* – includes speaking, reading and writing component (age dependent) and auditory comprehension, i.e, ability to understand spoken language. Learning the expressive language and auditory comprehension of a language is a lifelong activity that begins at birth. Table 1 discusses the various competencies that develop during early childhood.

An important principle of language development is that of the receptive language – the capacity to listen, hear

Table 1: Language Competencies Developed during Early Childhood

<i>Approximate Age</i>	<i>Expressive Language</i>	<i>Auditory Comprehension</i>
2 to 4 months	Verbal play through cooing, gooing and laughing. Vowel sounds heard such as oooh, eee, and ahhh.	Turns head toward sounds and can begin to discriminate one sound from another.
4 to 8 months	Babbling begins. Some consonant sounds can be heard.	Anticipates an event (e.g. peek-a-boo) and follows a line of regard (e.g. visually follows toy moving across floor) as well as joint attention (i.e., capable of visually attending to object with caregiver).
8 to 12 months	Syllable variation (e.g. badugatadudah). First word approximations (e.g. dada for daddy). Non-verbal communication. Jargon (i.e., unintelligible speech) is present.	Relates words with physical objects (e.g. understands that the word “ball” actually means the object ball). Responds to simple phrases such as “no”.

1 to 2 years	10-15 words at 18 months, 40-50 words at 24 months. Uses mostly nouns and pronoun me/ mine. Jargon (i.e., unintelligible speech) still present	Increased attention to toys. Changes behaviour in response to comments made to him/her. Knows a few simple commands with gestures needed at times. Understands simple questions. Points to simple pictures.
2 to 3 years	150 words at age 2; 300-400 at age 3 years. Uses two-three words phrases frequently. Asks simple questions. Fluency can be poor. Jargon (unintelligible speech) mostly gone. Vowel sounds intact.	Comprehension shows rapid increase. Responds to more 2 step commands with prepositions (e.g. Pick up the ball and put it on the table).
3 to 4 years	Uses 600-1000 words and 3-4 word sentences. Pronouns and adjectives are used as well as some adverbs, prepositions, past tense and plurals. Answers what, where and when questions.	Understands 1500 words. Recognizes gender differences, plurals, pronouns, adjectives, and colours.
4 to 5 years	Vocabulary increases to 1000-1600 words and 4-6 word sentences. 3-4 syllable words are being used. Articles appears. Use more adjectives, adverbs and conjunctions. Fluency improving.	Comprehends 1500-2000 words. Understands if, because, why and when. Follows complex directions.
5 to 6 years	Vocabulary of 1500-2100 words. Uses complete 5-6 word sentences. Fluent speech. Many multi-syllabic words are used.	Understands 2500-2800 words. Understands more complicated sentences.

and understand – is almost always greater than the expressive language, which is the capacity to speak and convey messages.

How Do We Learn Languages?

Different schools of thought have different opinions on this issue – behaviourist and social learning theorists, such as Skinner (1957) and

Bandura (1977) say that imitation and positive response is how language develops. Children who are deprived of hearing language can end up permanently incapable of learning and using language.

Noam Chomsky’s (1965) work broadened the view of how language is acquired with studies that indicate that children from all cultures develop

language skills in the same sequence at close to the same time, supporting a biological approach to language. His idea is that there is a *language acquisition device (LAD)* present in all humans, but not in animals. Proofs of this are the choices in grammar that children make automatically. No one teaches a child to say 'goed' – it comes from the internalization of language. The child converts the tense using an untaught rule. It also causes the switch from 'goed' to went a little later.

Interactionist theorists, such as Bruner (1983), agree that there are behavioural and biological aspects, but they emphasize the role of an environment in which adults support language learning and use.

Technology in Education

Technology in language learning encompasses devices like the radio and television to computer peripherals and tablet PCs. Technology in the educational set up is seen in many forms– from the computer in lab, to the projection system in the classroom; while at home television also becomes a technological aid.

Parents often can find it difficult to know what is best for children because many of them were unavailable during their times. Plowman and McPake (2013) discuss seven myths about technology and young children as childhood and technology shouldn't mix; young children are 'digital natives'; technology hinders social interaction; technology dominates children's lives;

best educational experiences are based on play; if it is interactive, it must be educational and that children need to get tech savvy for their future lives. Plowman, Stevenson, Stephen, and McPake (2012) suggest that interactions with technologies could support the learning at home:

- (i) Operational learning—learning how to control and use technologies, getting them to do the things you want them to do, and having opportunities to make your own inputs and get a personalised response
- (ii) Extending knowledge and understanding of the world— finding out about people, places, and the natural world.
- (iii) Dispositions to learn—showing greater concentration and persistence and gaining self-confidence and self-esteem while becoming increasingly competent users of digital media

Technology in Literacy and Language Learning

The relationship between literacy and technology is a complex one as many children nowadays are immersed in technology since their birth. Technology has always been an essential part of literacy. In order to write, one needs tools and the nature of those tools inevitably shapes the writing process. In order to read, one also needs technology—paper, print, computer screen, etc.—on which to present text, and the nature of that

technology inevitably influences the literacy experience (Marsh and Singleton, 2009). However, what is becoming increasingly obvious is that new technologies are fundamentally changing literacy practices and texts (Lankshear and Knobel, 2006). Carrington and Robinson (2009) put forward the term 'digital literacies' to connote reading, writing and meaning-making with texts that are created using digital technologies and disseminated via a range of media such as computers, mobile phones, and televisions. Bearne et al. (2007) discovered that young children are often exposed to computers, interactive whiteboards, televisions, videos, and digital cameras in their school or pre-school setting, while others also used mobile phones and games consoles in their role play situations. Bearne et al. (2007) reported that 'very young children show expertise in on-screen reading, even where homes have no computers', as the handling of such texts is now embodied within a culturally valued discourse. As a result, it appears that young children are developing the skills to become 'digitally literate' (Glister, 1997) before they come into the school setting. While this may mean that young children are developing strategies that allow them to access and read a variety of digital texts with fluency (Levy, 2009).

Segers, Takke and Verhoeven (2004) compare the effects of story reading by a computer and teacher on comprehension and vocabulary

learning, whilst Silverman and Hines (2009) consider teacher and multimedia-supported vocabulary instruction (using videos to reinforce vocabulary). De Jong and Bus (2004) evaluate the role of electronic books in supporting story understanding, whilst Eshet-Alkalai and Chajut (2007) explore the use of Living Books in supporting second language acquisition. A further ten studies investigate the use of programs to support phonological awareness and word attack skills. These range from studies of the impact of the personalised support provided by an integrated learning system (Bauserman, Cassady, Smith and Stroud, 2005) to studies of programs, such as talking books or computerised games, designed to develop specific aspects of phonological awareness and letter/sound correspondence (Watson and Hempenstall, 2008; Wood, 2005; Chera and Wood, 2003; Comaskey, Savage and Abrami, 2009; de Graaf, Verhoeven, Bosman and Hasselman, 2007; Chambers, Cheung, Madden, Slavin and Gifford, 2006), letter recognition (Brabham, Murray and Bowden, 2006) or word recognition (Lewandowski, Begeny and Rogers, 2006). Korat and Shamir (2007) compare independent reading of an electronic book with an adult-read story in terms of the impact on children's decoding skills and vocabulary.

Robin Close (2004) reviewed research on the effects of television and

concluded that children who were heavy viewers of television were more likely to have delayed language development. Rich language development needs social interaction and television is a one way mode of communication. Even good quality programmes for young children are unlikely to deliver the possible benefits, unless a familiar adult watches with the child and make connections, either at the time of watching or later.

Christakis et al. (2009) have shown that every extra hour that the television was left on in the family homes, fewer words in total were spoken to under 2s by their parents. The screen time actually reduced personal conversation and the crucial need for babies and very

young children to hear meaningful spoken language in context.

Apart from helping normal students, technology can be a boon to students with special needs. Technological adaptations – *assistive technology*– assist children with special needs as they strive to participate in a regular educational environment. Judge, Floyd and Jeffs (2008) provide an assistive technology tool-kit to promote inclusion. This technology tool-kit designed for use with young children with disabilities that can be easily assembled and implemented by early childhood professionals. Table 2 lists the suggested assistive technology tool-kit items and features as provided by Judge, Floyd and Jeffs (2008) for CWSN.

Table 2: Suggested assistive technology tool-kit items Judge, Floyd and Jeffs (2008) for CWSN

<i>Purpose of tool</i>	<i>Tool</i>	<i>Features</i>
Communication	Visual schedule, calendar, lists	Pictures or symbols representing a desired activity or task are inserted in a schedule, calendar, or list.
	Picture communication symbols	Ready-made symbol sets for communication and teaching language concepts.
	Boardmaker software	Software program that contains over 3,000 Picture Communication Symbols to make communication displays or educational materials.
	Boards with objects, pictures, symbols	Boards with pictures or symbols to use for communicating, scheduling or choice-making activities.
	Picture symbol display books/boards	Books or boards containing picture symbols that are theme based on everyday activities.
	Talking switches	A single message communication aid when user activates switch
Movement	Weighted vests	Vests that open down the middle and the amount of weight is adjustable. The

		heaviness of the vest provides excellent sensory input and often helps increase attention and concentration.
	Positioning devices (sitting, standing, etc.)	Pediatric positioning equipment that provides comfortable and stable support for seating, standing, and positioning needs.
	Adaptive seating	Chairs that are height and depth adjustable with firm backs.
	Adaptive tables and desks	Tables and desks that are height and depth adjustable
Learning	Adaptive scissors	Easy-grip scissors with loop handles and blunt tips.
	Pencil grips	Soft rubber triangular grip that fit on pencil to help students top position fingers correctly.
	Switches	Switch can be touched anywhere on its surface to operate any adapted item
	Electronic toys	Battery-operated toys that can be used with switches.
	Switch accessible toys/games	Toys or games that have been adaptive so that children can control their movements with capability switches.
	Slant board/ clipboard	Desk-sized easel for students who work best in a vertical orientation; slant/ clipboards promote better functional postural position and stability.
	Talking books	Digital books available in different formats that allow children to hear the story read aloud.
	Touch screen for computer	Touch screen that mounts on the monitor of the computer; software can be accessed by the touch of a finger to control the computer and interact with software programs.
	Adaptive keyboards	Alternative keyboard that features large, well-spaced keys in high contrast colors to make it easy for users to locate letters and numbers

Criteria to Evaluate Software / Appliance for Language Learning in Early Childhood Curriculum

Table 3 provides various aspects and

criteria that can be used to evaluate software/appliance for language learning in early childhood curriculum.

Table 3: Various aspects and criteria that can be used to evaluate software/appliances for language learning in early childhood curriculum

<i>Aspect</i>	<i>Criteria</i>	<i>Rationale</i>
Hardware and Operating System requirement cost	Low Cost	As technology is changing and budget being a major issue in schools, it becomes difficult to have latest technology always in the classes.
Utility	Self Access or Guided by Teachers/Parents	Using self access/self-learning software or apps is not advisable for very young learners. They can be used for children from 6-8 yrs of age.
Reviews	Software that are to be purchased need to be reviewed in standard publications	Reviews differ from other forms of evaluation in that they typically focus on the software itself rather than on the environment in which the software will be used (Hubbart, 2006)
Product type	Game Based/ Drill and Practice	Younger children should be encouraged to learn in a game based environment and there should be scope for sufficient practice if they are to master skills.
Content	Age Appropriate Engages the student Colourful Gives scope to develop listening	Listening is the precursor of speaking and research has shown the paucity of listening opportunities has an impact skills on the language learning ability of the students.
	Has expanded complexity	If the software has expanded levels of complexity it would also cater to the various levels of the learner. Generally in a game based learning environment this is evidenced by Beginner Level, Intermediate Level and Advanced Level.
Images	Colourful and Non-violent Supplement the text or audio Animations	Colourful and non-violent. As the students in this age group are very impressionable. Young children are able to develop their visual and auditory comprehension. Pace of animations needn't be such that the student loses attention or such that the student forgets to blink and stretches the eye muscles.

Navigation	Easy Clear icons Between audio and activities simple	So that the students are able to use the software and apply easily
Audio	Loudness Quality of sound Clarity of speech	The software shouldn't play unpleasant and loud music so that the younger children are unsettled. As listening skill is one of the foundations to develop a clear speech, the auditory input needs to be clear.

Conclusion

Technology has strong potential for enhancing the education of young children. The experiences of using software are similar to those of reading a book with a child; the value is as much in the interaction between the child and adult as it is in the content (Irvine and Prejean, 1999). In order to maximize the

benefits of computer use in education, all the educators should keep in their minds this question: "Can we use technology to teach the same old stuff in the same way or can we capitalize on the benefits of technology by using integrated computer activities to increase achievement?" (Clements and Sarama, 2002).

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