Literature Review on developing reading fluency for poor readers using computer based instruction.

Barakansanya Swai
Supervisor: Sonia Berman
30 April 2013

ABSTRACT
Most children at their early stages in learning experience difficulties in acquiring reading skills. This literature review examines various methods to improve the acquisition of reading fluency with emphasis on computer based instruction. A brief overview of other methods will be examined followed by comparison due to their effectiveness. Experimental results indicate that computer based instruction achieves not only acquisition of reading skills but also enhance in the overall academic development of early learners. Inclusion of pedagogical features in computer based instruction material will also be discussed.
INTRODUCTION

Reading fluency can be achieved by acquiring good word reading skills and reading comprehension. [1] Acquisition of these two components comes from various methods to enable reading fluency for beginner-level readers; these methods will be discussed in this literature review. An in depth analysis of computer based material to achieve reading fluency will be examined along with supporting experimental results. A Critical comparison of conventional methods to computer based instruction will be made in terms of their effectiveness in the learning process. Additional techniques on computer based material will also be discussed.

Traditional Training Strategies

Before the introduction of computer aided tools for training early learners to read, traditional strategies were applied. Reading ability can only be acquired through practice which cannot be taught in class. [2] As the focus of this literature review, emphasis will be placed on improving the reading fluency components, however reading ability for early learners is based on three aspects; phonological awareness, word recognition and letter recognition. [3] These components were improved by a number of strategies that are to be discussed. At the early stages learners require some assistance and guidance during their training sessions. There are about four ways in which one could improve reading fluency which are namely; repeat reading, class wide peer tutoring, peer reading and previewing.

Reading fluency can be improved by repeat reading where a student is provided with a passage then asked to read several trials. Trials can begin with the teacher reading along with a student and then advance to self-reading. These trials show an increase in fluency but mainly due to memory of the words read which also later allows a decoding of words and comprehension. [4] In addition a student’s gain in confidence increases as the number of trials increase and then eventually masters reading the passage. Every passage provided was appropriately selected according to student’s reading level.
Another method that was used was class wide peer tutoring which involved having half the class read certain passages while the other half examined the passage read. [4] This approach was conducted with one group reading a passage three times before moving to the next passage; the other group read more passages but without repeating. Results show that the repeat reading group in the class wide peer tutoring performed worse than the sustained reading group. Reading fluency gain by students with reading difficulties at the same time provided the reading aloud practice. [4]

Peer reading which is slightly similar to class wide peer tutoring was conducted by grouping students into pairs to analyze one another. Each group had a student with stronger reading skills compared to their respective partner; both students could role play as tutor or tutee depending on the currently active reading partner. A time limit was set to a given passage and points awarded based on the rules set by teacher. After a week the students handed in reports and the team with the highest points was awarded as the winner and praise was given to all teams. This gave a feel of achievement to all participants. The following week teams were reassigned and the same process was continued during the training term. Students’ training with various partners gives them exposure of how to tackle certain difficulties while reading to one another in the training sessions. [4]

A previewing strategy was conducted by allowing student to view the material before a formal passage reading. Students could read the passages silently, listen to recorded tapes of the material or peers’ reading from partner. In case of tape recordings, the teacher must read material slowly so as to allow student to follow through carefully and anticipate hard vocabulary. Experimental results show that the reading fluency of students is improved by the end of the training session. Students tended to make fewer mistakes especially after previewing material before commencing the session. [4]

The strategies discussed above are non-computer based instruction approaches which have a positive influence on reading fluency. All these approaches are mainly focused on above beginners’ level learners that have acquired the basic reading skills. These strategies apply only to a certain level of reading. As you go higher up the levels of reading fluency can only be achieved by acquisition of knowledge of material read. [2] In addition it has been noted that some of the strategies practiced tend to overlap on their methodologies.
Computer-based Training strategy

Technology has been one of the greatest inventions of this information age. Most of the educational materials used in the traditional methods of instruction have been transformed to computer-based materials. This transition has come with pros and cons in the educational training field; in this literature review emphasis will be placed on training early learners to read by using computer-based instruction. Various projects that have been implemented will be studied and their respective flaws discussed. This approach has proved to be quite effective for training. Methods and models used by each particular system where appropriate are to be examined whilst a brief discussion of practice implications will be conducted. Some of the systems examined generally focus on acquisition of reading skills even though there is a need for emphasis on reading fluency.

One implementation of computer based instructions was conducted on early learners between the ages of 5-6. This was an experiment to determine whether a gain in reading ability is achieved by through the use of technology. [1]High tech material was used which involved using a high-quality sound device with visual capabilities alongside interactive mechanism and speech recognition & synthesis. A group of students from 46 middle class status participated in this experiment. To test the hypothesis which states that “computer-based training provides better training than other conventional methods”; two groups were formed one which was provided with printed-only material while the other was used as a control group. The control group received the normal school training unlike the other two groups which undertook the intervention program. [1]

Pretesting of reading skills was conducted to determine the reading level of students; students with a score lower than the predetermined lower boundary were selected for this intervention. The four tests conducted were phonological awareness, word recognition, letter naming and Peabody picture vocabulary tests. Training started and the students were randomly placed in one of the three groups. At the end of the session the results showed a significant difference on the various test features among all three groups. The computer-based instruction group had the best results then followed by the printed-only instruction material group and then lastly the control group. [1]These results suggested that computer-based instruction enabled an effective acquisition of reading skills; which could be due to the flexibility of the program, enjoyment due to its interactive mechanism, immediate feedback that boosted self-confidence and a sense of being in control which allowed students to choose the materials
they want to read. Other features that lead to the success of this implementation will be discussed later; however this technology was very costly. [6]

Another implementation of computer-based instruction was the internet based CASTLE (Computer Aided Strategy Teaching & Learning Environment) which mainly focused on improving reading comprehension. These strategies were applied to both the narrative and the exposition text using a model known as SOI. [2] SOI stands for selection, organization and integration which are all mechanisms used by readers while attempting to comprehend the text. Selection was the ability of a student to pick up relevant key words while reading a passage. Organization was the ability to arrange ideas that overlap in a systematic manner. Integration was about the ability to link concepts and summarize as a way to acquire knowledge from text read. This was conducted by students that were past the beginner level of reading because comprehension serves as an advanced reading skill. Most online based programs offer reading training for beginners; however most of them require payment for extra added functionalities.

Plato IV system as a computer-based instructional System was used to examine the gain in reading ability through the repeat reading practice. The program used for this training was known as Programme Prose which measured the accuracy and the reading rate of students. [7]Both accuracy and rate of reading contributed to the fluency of a reader. There were two groups of high school students that participated in this experiment; each group was given a set of 80 passages ranging from level 2-9 of the reading standard set by the NRS (National Reading Standards). 10 passages were randomly selected for each level and students had to master their current levels before proceeding to the next level. Experimental results suggested that there was a significant gain in automaticity of decoding text & reading comprehension during the lower levels of reading. At higher levels there was a slight improvement or no gain by students, which was due to them knowing the vocabulary and knowledge of the topic. In addition the gain in reading accuracy and rate was also affected by how quick a student responded to the system while reading the passage.

The Hint &Hunt program which mainly focused on improving reading fluency of students had game-like activities to enhance training. The pros of this program were its ability to improve fluency and at the same time assess the reading abilities of students. [4]

Computer-based instruction training has proven to be essentially vital and effective in the process of acquiring reading skills for various reading levels. The tools used by these implementations mostly achieve specific gains in reading and at the same time other academic and social developments.
Students’ especially young aged learners enjoy these tools during training because of their informal presentations unlike classroom formal approaches. [5]

**Critical Comparison**

Traditional strategies used to train poor readers have been effective to some extent. However one would argue that based on specific tasks computer-based strategies perform better. [8] The introduction of technology to this training field has simplified the training process but not all features have been implemented fully. The lack of pedagogical features on most tools used by computer-based instructions results into inappropriate reading level during training sessions; for example while training takes place in traditional methods the teacher normally assess the level of reading a student currently possess and provides material based on this assessment. [1] This feature is lacking on most software based training tools hence the emphasis for its inclusion. The other benefit of computer-based instructions especially for the high tech developments in bringing about motivation and self-confidence in students which eventually benefits their academic development in general.[3] Observations made at the help2Read center suggested that the flexibility of sessions and their informal practice makes it enjoyable for the students. Moreover the sense of control along with praise and encouragement during this practice boosts ones confidence. These qualities can be implemented by most computer systems except may be the connection between volunteers and student in terms of having a good relationship; computers as machines do not possess this quality. It has been noted that especially in the less developed communities a lack of good nutrition affects the reading abilities of children. The environment of the students’ daily life activities and social treatment affects them psychologically hence bad treatment leads to poor performance. [2]

**Conclusion**

Strategies used to train poor readers tend to overlap one another in order to accomplish certain components of reading skills. The computer based approaches have proved effective in implementing the traditional methods using a computer. [1] As we noted there are features that computer-based instructions possess which traditional methods do not and vice-versa. A combination of strategies used
by computer-based tools will enhance the development of reading fluency for just above beginner level learners. However the need for further research of this field to solely investigate on specific components?

References