Running Head: Word Processors: Do they Assist Writing Ability?

Word Processors: Do They Enhance Elementary School Children's Writing?

Kimberly A. Schwartz

University of South Florida

Abstract:

In this article, I focus on a review of the existing research pertaining to the use of word processors in K-6 writing classrooms and the effects of technologies on students' writing ability. As integrated as technology appears to be in today's curriculum, the effects of using word processors for writing enhancement, instruction and practice remains to be clearly established. Throughout this article the themes of revision, keyboarding, quality of writing produced, publication, social climate, and student attitude are discussed as consistent areas of focus within the research. Researchers are charged to be consistent in their research designs, operational definitions and settings to produce more generalizeable and less contradictory findings.

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The original intent of this article was to review the existing research regarding the use of technology in classrooms and the effects of technology on a students writing ability. However, as I reviewed the literature, it became clearly evident that the term "technology" was not only dependent on varying interpretational definitions and schemas, such as a computer, spell-checker, calculator, DVD/VHS recorders, Personal Data Assistant, and cellular phones, but also its potential uses in a classroom. The Association for Educational Communications and Technology (AECT) has defined technology in education as the "application of technology to any of the processes involved in operating the institutions that house the education enterprise, including the application of technology to finance, scheduling, grading and other processes that support education" (Thompson, Simonson, & Hargrave, 1996, p. 3). Due to the broad nature of its definition, the research that encapsulates technology use in the classroom was too vast for an article of this nature. I therefore narrowed my literature search to contain a segment of technology that would have a more concise and applicable definition for this review. Word processing is defined as the manipulation of computer generated text data including the creation, duplication, revision, storage, retrieval, and printing of a document (New World Dictionary, 1988). Subsequently, the refocused and narrowed scope of this article is to review the existing research specific to the use of word processors in K- 6 writing classrooms and the effects of technology, (e.g. word processors) on a student's writing ability.

Background

Beginning with their creation and production for general use in the late 1970's, computers have been used in classrooms across the nation. They teach and drill specific writing skills, manage students' progress, motivate users with computer-based activities, and have been integrated into the activities and curriculum of reading and writing and early literacy instruction (Reinking & Bridwell-Bowles, 1991; Daiute, 1986). The use of computers has found its way into brief sentences of suggestions too large sections and complete chapters in teaching textbooks and the teacher's editions of district writing programs (e.g., Roblyer, 2003; Willis, Stephens, & Matthew, 1996). Seemingly endless books and guides have been written and published to better acquaint and provide assistance for teachers in the implementation of computers into classrooms and pedagogies (e.g., Moeller, 2002; Daiute, 1985).

The writing process is viewed by some as a recursive craft that allows material to be shaped and reshaped until an end product is produced (Graves, 2003; Nichols, 1996; Calkins, 1994; Murray, 1984). Others see writing as an activity involving cognitive, physical, affective, and social processes in a parallel model of sorts (Daiute, 1986). Regardless of the interpretation held, one element remains consistent; the writing process is physically altered with the introduction of word processing (Macarthur, 1999, 1988).

Themes

In many classrooms across the nation technology is integrated into the curriculum but the effects of using word processors for writing enhancement, instruction and practice remains to be clearly established as there are several themes that complicate a thorough review of the existing literature. To better meet the intent and purpose of this review, three themes were focused on: a) the diversity of measured outcomes in the research, b)

contradictions among reported findings and c) the steps involved within the word processing experience. Throughout the discussion of identified themes it is important for the reader to keep in mind that the aforementioned factors have made a complete synthesis and thorough generalizability of the findings particularly difficult.

The reviewed research that contained measurable outcomes was abundantly vast and varying. Some of the research focused solely on revision (Fitzgerald, 1987; Daiute, 1986) while other research measured revision and writing quality (Owston, Murphy, & Wideman, 1992). Still others (Macarthur, 1999, 1988; Owston & Wideman, 1997; Nichols, 1996; Snyder, 1994) focused on the overall impact of computers on the writing process.

Contradictions across reported findings also contributed to the complication of research results. For example, Bangert-Drowns (1993), conducted a meta-analysis of word processing in writing instruction. In this analysis, 33 studies were reviewed. Of the studies reviewed, 26 found that types of composers, those with and those without computer assistance had a negative or impartial attitude at the conclusion of each respective study. Reinking & Bridwell-Bowles (1991), Snyder, (1994) and the remaining seven Bangert-Drowns (1993) studies concluded there was a higher likelihood of positive attitudes and more motivated students toward the use of computers for instructional activities than in traditional writing situations.

The most prominent theme revealed by the research reviewed involved the various steps within the word processing experience. This includes the use of revision (Macarthur, 1999, 1988; Nichols, 1996; Bangert-Drowns, 1993; Cochran-Smith, 1991; Daiute, 1986; Scardamalia & Bereiter, 1986), writing length (Owston & Wideman, 1997;

Nichols, 1996; Bangert-Drowns, 1993; Daiute, 1986; Macarthur, 1988), the application and use of a keyboard (Bangert-Drowns, 1993; Cochran-Smith, 1991; Daiute, 1986; Bereiter & Scardamalia, 1982), and the publication of text (Graves, 2003; Macarthur, 1999,1988; Calkins, 1991).

Revision

Word processors have helped to foster revision and remove the often-cumbersome task of re-copying a draft (Beck & Fetherston, 2003; Macarthur, 1999, 1988; Macarthur, 1999, 1988; Nichols, 1996; Cochran-Smith, 1991; Scardamalia & Bereiter, 1986). Daiute (1986) reported that inexperienced writers produced surface or superficial changes while experienced writers often revised allowing their works of discourse to take shape after several revisions. Bereiter & Scardamalia (1982) suggested a reason for such findings lay in the novice writers' deficient knowledge of appropriate strategies to use when revising. Beck & Fetherston (2003), Cochran-Smith (1991) and Macarthur (1988) add that revision strategies and skills must be possessed prior to the use of a word processing option. Writing strategies and skills are not acquired as a result of the word processor; rather they are facilitated and used as the writers compose their respective texts. In comparison, Macarthur (1988) found that the students who composed with pen and paper did not revise until the end of their piece. This type of end revision not only provided a greater opportunity for the student to forget what was planned for revision, it also introduced new errors during the recopying stage.

Quantity of Writing Produced

Students who used a word processor tended to compose drafts of greater length then those who wrote by hand (Nichols, 1996; Bangert-Drowns, 1993). Owston and

Wideman (1997) as well as Snyder (1994) attribute this increase in length to a lack of distraction and a more engaged task-focus exhibited by students working on word processors. Daiute (1986) found that the initial length of word processing composition, when compared to those who wrote by hand, were shorter until the revision process. The word processing group increased both the written quantity and quality of their work by making significant and meaningful revisions to their papers. Macarthur (1988) found similar finding in his study of ESE students using word processors. Both the quantity and quality of writing improved over those who did not use the word processors in their classroom.

Keyboarding Skills

Cochran-Smith (1991) found that keyboarding skills alleviated the physical constraints associated with writing (e.g., erasing, semantic web making), thereby allowing for the writing process to be accelerated. Flower & Hayes (1981) found that during the composition stage of the writing process, the composer was required to make a series of choices and decision and should the composer become distracted by mechanical demands, the global task of planning is disrupted, thus impairing the writer to complete the process effectively. One such mechanical distraction could be the use of a keyboard. Macarthur (1988) suggested the systematic instruction of keyboarding skills prior to a students use with a word processor as a viable way to remove a student's potential frustration. Prior to use, students should experience and preferably master the editing commands that are inherent in a class utilized word processing programs (Bangert-Drowns, 1993; Beck & Fetherston, 2003; Daiute, 1986).

Publication

The theme of publication is one that can be found in process approach classrooms across the nation (Calkins, 1991; Graves, 2003). For these classrooms, the process of writing or generating text comes to an end with the publication of work. As such, the use of a word processor was found to facilitate this final stage. Through the use of a neat, printable, and publishable work, students are able to immediately share their work with others (Calkins, 1996, 1991; Grave, 2003; Macarthur, 1999, 1988). This sharing ensures that the author is part of a community of writers. With the use of electronic networking, students are able to share their works over longer distances helping to enforce the connection between conversation and formal writing while producing immediate feedback (Graves, 2003; Macarthur, 1988).

Social Climate

The very nature of a computer monitor allows for greater visibility. This, in turn, allows and promotes social interaction and facilitation of the social dynamics possible within a classroom as well as provides an environment in which peers assist others to achieve their potential (Dixon-Krauss, 1996; Vygotsky, 1978). An increase in support for and of written expression was found as the students and teachers created new social arrangements in the classrooms (Cochran-Smith, 1991; Graves, 2003; Scardamalia & Bereiter, 1986; Snyder, 1994). Word processors were used as a vehicle for the facilitation of collaboration on writing projects (Cochran- Smith, 1991; Owston & Wideman, 1997). However, Macarthur (1988) found the word processors were only conducive as a vehicle if the teacher promoted collaborative work (Macarthur, 1988). Teachers were viewed more as facilitators, editors, and advisors (Snyder, 1994), than instructors and in many cases, shared in the experiences with the students (Owston &

Wideman, 1997). The time continually required to implement such a collaboratively responsive and socially expressive classroom combined with new demands, such as the role of facilitator, were found to be constrictive to the instructor. Snyder (1994) reported that spontaneous and creative classroom teaching contained traditional writing techniques but required more planning and instructional time.

Student Attitude

Student attitude related to word processing and the writing process was dependent upon the research reviewed. The habitual and daily use of word processing should be embedded into the context of classroom writing instruction that emphasizes the writing process in order to produce greater writing competency (Bangert-Drowns, 1993; Macarthur, 1988; Owston & Wideman, 1997). Instruction and instructional interventions must be provided within the context of using the word processors (Cochran-Smith, 1991). Without context the effectiveness and motivation of the student's experience is greatly diminished.

The immediate utilization of a publication for an audience may enhance student motivation (Calkins, 1991, Graves, 2003; Macarthur, 1999; 1986; Reinking & Bridwell-Bowles, 1991). Students appeared to be more motivated and expressed positive attitudes toward using the computers for instructional activities (Reinking & Bridwell-Bowles, 1991; Synder, 1994). The use of word processors with struggling writers however suggested that if the writers had previously experienced difficulties with writing then they showed a greater improvement after word processing experiences than those that received typical writing instruction without the word processor (Bangert-Drowns, 1993; Macarthur, 1999, 1988; Owston & Wideman, 1997). Synder (1994) went on to suggest

that the behaviors appeared to have more to do with the task and genre of the assignment than the tool used in the discourse.

Discussion

As of 1996, the estimated number of microcomputers in classrooms was roughly 2,400,000 (Thompson, et. al., 1996). Even as young writers are crafting their first sentences using word processors, access and use of word processors in the classroom remains an inequitable element that is often based on class, race, gender and ethnicity (Cochran-Smith, 1991). The effectiveness and impact of the computer is completely dependent on the ways the students and teachers use the technology (Macarthur, 1999). For example, if a teacher chooses to use the word processor as a means of interacting with the curriculum through the use of virtual text, the students will have a greater likelihood of retaining and processing the information to be used at a later time. Computers should therefore, be greater utilized in the classrooms that are privileged enough to have them.

The use of word processing programs has allowed for an increase in revision strategies used, if the strategies were present prior to the introduction of the word processor. Only inexperienced writers were handicapped by the mechanical demands of revision (Scardamalia &Bereiter, 1986). If this is the case, then revision strategies should be taught in context to the instructional activities. If students are at the composing stage of writing, they should be equipped with at least elementary revision skills. The use of a computer lab would allow for a whole-class introduction and subsequent experiences using the keyboard and editing commands of the computer. If learning can only take place in context, then there is no reason for a lack of strategic revision knowledge for

students to use during word processing experiences. This will enhance the students' power as a writer to produce text without the added frustration of often arduous re-copying. Utilization of the computer-lab or classroom computers provides the opportunity to practice keyboarding skills thereby facilitating writing that might otherwise be impeded by a lack of keyboarding knowledge.

The role of the teacher must be re-examined if word processors are to be used in the classroom. In many of the reviewed studies, teachers either implemented both a computer-enhanced class and a traditional writing class or, the teachers only one of the options. The teachers' perception of word processors used in classrooms could greatly influence the way in which they teach. This would subsequently influence and skew the results of the study. Teachers must be willing to leave the role of director and take on one of a facilitator, assisting students as they engage, independently and collaboratively, in their writing experience.

One element that was only mentioned in three of the reviews warrants attention- the Hawthorne Effect- a tendency for participants to change a behavior because they are participating in a study (Ary, Jacobs, & Razavieh, 2002; Thompson, et. al, 1996; Synder, 1994; Reinking & Bridwell-Bowles, 1991). Perhaps the participants of the studies had increased attitudes and motivation because they had the opportunity to share in a unique community and experience something they enjoyed together in an environment that had a great deal of attention. If this is true, the studies would obviously have to be conducted from a more controlled research standpoint, but the underlying question remains; why didn't any of the other researchers consider the possibility of a Hawthorne Effect? If the

studies had been conducted systematically, the researchers could make sure to allow for and anticipate participants who altered their behavior because they were in a study.

Directions for Future Research

At the conclusion of the research reviewed, a few questions that I began with remained unanswered and a couple of new questions emerged. First, how is writing improvement measured in the classroom context- making sure to use consistent operational definitions for both a word processor and traditional forms of composition as well as variables being measured? Can the special features of the word processor, such as spell checker and grammar checker, be effectively and contextually used to enhance writing ability? If so, how?

Research also needs to be conducted in long term studies that measure writing and social contexts (not one or the other) while considering the complexity of the factors that interplay with longitudinal studies and varying learning contexts. Another area that needs to be studied is teacher perception of technology use over the course of a period of time and how that perception influences classroom instruction. Still further, how does teacher perception influence the students' opportunities to learn?

In many classrooms, computers are a far too often overlooked tool for those students who may be able to benefit from their use. In what ways and to what degree can a word processor assist a student with handicapped fine motor skills or struggles with handwriting in general?

Lucy Calkins (1991) said, "we can't give children rich lives, but we can given them the lens to appreciate the richness that is already there in their lives" (p. 35). If the

notebook can help support that lens, why can't a computer screen? Both validate the child's thoughts and provide a blank canvas to be filled.

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