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## The benefits of word processing in process writing

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## The benefits of word processing in process writing

### Abstract

The word processor is a valuable writing tool that can have a notable impact on the writing process and on the social context for writing in today's schools. The majority of the research on writing with a word processor has indicated the word processor does provide specific benefits for our students and may be used to develop skill in writing.

This review defines the process approach to writing, reviews the research on the benefits of using the word processor in process writing as well as the research which doesn't support its use, and discusses variables that affect the research results. Throughout the review, it is evident that further research is needed to examine in greater detail the established benefits of the word processor. It is suggested that further research include a greater number of participants from the elementary grades.

THE BENEFITS OF WORD PROCESSING IN PROCESS WRITING

A Graduate Research Paper

Submitted to the

Division of Reading and Language Arts  
Department of Curriculum and Instruction

in Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by

Renee Cecile Leimer Cuvelier

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This research paper by: Renee Cecile Leimer Cuvelier  
Titled: The Benefits of Word Processing in Process Writing  
has been approved as meeting the research requirement for the  
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## Benefits of Word Processing

August 4, 1997

Editors  
The Reading Teacher  
414 White Hall  
College of Education  
Kent State University  
Kent, OH 44242

Dear Editors,

Enclosed please find five copies of the manuscript "The benefits of word processing in process writing," which I am requesting you consider for publication in The Reading Teacher. This manuscript is an original work and has not been simultaneously submitted to any other publication outlet.

Thank you for your consideration. I look forward to hearing from you.

Yours sincerely,

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Running head: THE BENEFITS OF WORD PROCESSING IN PROCESS  
WRITING

The Benefits of Word Processing  
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Abstract

The word processor is a valuable writing tool that can have a notable impact on the writing process and on the social context for writing in today's schools. The majority of the research on writing with a word processor has indicated the word processor does provide specific benefits for our students and may be used to develop skill in writing. This review defines the process approach to writing, reviews the research on the benefits of using the word processor in process writing as well as the research which doesn't support its use, and discusses variables that affect the research results. Throughout the review, it is evident that further research is needed to examine in greater detail the established benefits of the word processor. It is suggested that further research include a greater number of participants from the elementary grades.

**THE BENEFITS OF WORD PROCESSING IN PROCESS WRITING**

Writing, a component of literacy, is an important communication skill, and in a technologically complex world, the ability to communicate effectively has become crucial (Smith, 1985). Communication through written language has become even more important as the global population takes on the task of using computers and word processors in their everyday life. The technologically literate are using electronic mail (email), facsimiles (faxes), and the Internet to communicate on a daily basis. One of the most distinct advantages of using these types of communication devices is timeliness. Email and faxes save valuable time. The information available on the Internet is updated often to keep its currency, sometimes on a daily basis. Therefore, in order to keep our children prepared for their future, it is pertinent that computers be included in the curriculum. One area of curriculum that has already established a use for technology is writing through the use of a word processor (Willis, Stephens, & Matthew, 1996).

The word processor is a valuable writing tool. It is widely used to ease the task of writing at all stages of composing. It is thought by many that the word processing programs available today potentially can help children write and revise better than they might with traditional paper and pencil (Daiute, 1983). It is the classroom and content-area



teachers of writing and the students they teach who will discover the potential benefits word processors have upon the writing process when used as part of a balanced writing curriculum.

A balanced writing program may include each of the following strategies: writing aloud (the teacher writes in front of students and also verbalizes what she is thinking and writing), shared writing (the teacher and students compose collaboratively, the teacher acting as a recorder), guided writing (students do the writing and the teacher guides the students and responds to them to extend their thinking in the process of composing text), independent writing, and language opportunities to respond critically and thoughtfully (such as a peer-peer writing conference or teacher-student conference (Routman, 1991)). In a balanced writing program, teachers and writers interact often and make use of all these approaches (Routman, 1991). In such a balanced writing curriculum, learners' abilities to apply what they have learned to real-life situations and circumstances develop. These transactions from practice to real-life practical use are important for the learner (Willis, Stephens, Matthew, 1996).

Although the body of research investigating the use of word processors for process writing is small, there is some evidence that there are advantages to using a word processor

in process writing. It is the purpose of this article to synthesize the research on using word processing programs in the teaching of process writing in order to investigate the benefits that have emerged. In order for readers to have a common understanding of writing as defined in the paper, process writing will be described, followed by a discussion of (a) the word processor in children's writing, (b) benefits of using the word processor in writing, (c) research which doesn't support technology, (d) variables that affect the research results, and (e) discussion of the findings.

#### Process Approach to Writing

The process approach to writing is a student-centered activity that is non-linear and recursive but which is usually described in stages (Routman, 1991). Student-centered refers to the idea that the student experiences the entire writing process as a writer, reader, speaker, and listener (Rief, 1992). It also means students make their own decisions about topics and how they want to implement the writing process that day. The "process" refers to everything the student does from the first moment he/she considers the topic to the final moment when he/she inspects the finished paper. The process approach to writing is just that: a process. Students work within the different stages of writing and move back and forth when necessary. Process writing is usually described as involving the following

stages: prewriting or rehearsing, drafting, revising, editing, and publishing (Atwell, 1987; Graves, 1983; Rief, 1992; Routman, 1991).

### Prewriting or Rehearsing

The first stage of the writing process can be best explained as the prewriting stage. In this stage, the writer gathers information and identifies a topic and a purpose for the writing. Once this is done, the writer also identifies the intended audience. During the prewriting stage the writer may think about all or part of the writing and may plan on paper by drawing pictures. The writer may also create a word web or a semantic web, write a list of ideas, conduct interviews, or read resource materials in order to organize the ideas and gather information about the topic.

### Drafting

After the prewriting stage, writers begin to create a draft. In a first draft the writer gets ideas down on paper, without concern for mechanics. Writers put their thoughts on paper, letting the flow of the pen take over (Graves, 1983). According to experts on the writing process, it is crucial that teachers encourage students to focus on communicating their ideas during this stage with little emphasis on mechanics. It is often the concern with mechanics that slows writers down (MacArthur, 1988; Wild & Ing, 1994).

### Revision

When the first draft is completed, many writers are ready to go back and revise. Revision is an attempt to improve the clarity, organization, wording, fluency, and understanding. Sometimes revision and editing occur simultaneously although this part of the writing process is dependent upon various learning styles. To facilitate revision the writer may reread the piece and check for cohesiveness, clarity, organization and flow. Writers may confer with both the teacher, during a teacher-student conference, and with peers, during a peer conference. After conferring the writer decides how to respond to the reactions and comments about the piece. Writers may then use the process of sharing their writing with peers to gather more information on how to add, delete, and revise information from the first draft. Teacher led conferences and peer interaction can provide valuable insight for the writer (Routman, 1991). The feedback process can be ongoing until the writer is satisfied.

### Editing

When a piece of writing has reached a level of acceptance with authors, they can then choose whether to take their writings on to publication. If they do, however, then it is good at this point to go through the editing process. The latest draft must first be edited. For many children

this can be a tedious or difficult process. Editing involves checking for correct spelling, punctuation, capitalization, paragraph indention, and flow of the piece (Routman, 1991). Teachers are able to assist in the editing process through a teacher-student conference (Graves, 1983). Sometimes during the teacher-student conference, the student and teacher will address one area to work on or check for in the student's writing. In addition to teacher-student conferences, it is beneficial for students to work together in editing each others' work. In both the teacher-student conference and the peer conference, additional instruction in responding to writing is often helpful in order for the teacher and student to conduct purposeful and productive editing conferences. Expectations in editing will vary depending on the age of the students and the writing purposes. However, for all grade levels it is important not to emphasize editing too soon in the writing process. It is most important for teachers to guide students to communicate their ideas and write interesting, clear content that reflects personal voice and imagination (Routman, 1991). The purpose of editing is to convey the message clearly.

### Publishing

If the writer wishes to "publish" the piece, he or she may move from an editing conference to preparation of the final piece for sharing and/or publishing. Sharing involves

presenting the final piece to the intended audience. Sharing may consist of authors reading their piece to a classroom of peers or placing the piece on a bulletin board for public reading. Many teachers believe that sharing should be an integral part of every classroom because it emphasizes ownership and instills a sense of pride in one's work. Through sharing of written work, students can observe one another's ideas and writing styles. Both the publication of written work in a final copy, and the sharing of it publicly can be powerful tools that motivate children to continue in their reading and writing (Routman, 1991). Students may then come to value and understand the craft of writing in its entirety.

#### The Word Processor in Children's Writing

The word processor is a computerized device incorporating variously an electronic typewriter, video screen, memory, printer, etc., used to generate, edit, store, transmit, or duplicate documents such as letters, reports, etc. (Neufeldt & Guralnik, 1992). The word processor is programmed to execute various commands determined by its user. It has acquired revolutionary status due to its ease of use and production capabilities.

To assist in the development of children's writing, the word processor has become one of the most popular writing tools now available in today's schools (U.S. Office of Technology Assessment, 1988). This highly effective writing tool allows for children to produce, rearrange, revise, edit, spell check, and print any variety of work without having to copy or recopy the piece manually. The word processor can be a tool that is effective in helping students improve their writing (Cochran-Smith, 1991). The word processor is effective because once students have developed basic keyboarding familiarity, many are able to produce slightly longer texts than those that are written manually in the same amount of time. It has been hypothesized that using a word processor as a writing tool can ease revisions and actually encourage students to write more (Scrimshaw, 1993). Many teachers believe that word processors result in more effective revision, greater ease of revision, and increased motivation to write. The word processor can also produce neater, more error-free texts than texts written with paper and pencil. These are all potential benefits of using word processing in children's writing. Some hypothesize that disadvantages of using the word processor are that the overall quality of the students' written work may not improve (Daiute, 1985) in addition to the fact that when students begin to use word processing, there is an initial keyboarding

learning period, the length of which is dependent in part on the prior typing and writing experiences as well as the goals of the student (Cochran-Smith, 1991). This additional keyboarding learning period may be discouraging to some budding writers.

### Benefits of Using the Word Processor in Writing

In the following sections, I will look at the research that supports the use of word processors in teaching the writing process and the research that finds computers ineffective in writing improvement.

Much of the research provides evidence that word processing can improve performance of students involved in a writing program based on a process approach to writing (Seawell, 1994). The benefits of using the word processor in process writing have been listed as: (a) improvement in overall writing quality, (b) increased output of writing, (c) greater learner motivation and increased writing satisfaction, (d) increased levels of revision, (e) increased peer collaboration, and (f) collaboration with others. In the following subsections each benefit will be discussed.

#### Quality.

Students tend to produce higher quality compositions when writing is produced with the aid of a word processor (Scrimshaw, 1993; Shaw, Nauman, & Burson, 1994). Writing with a word processor may allow the student to become more



actively involved in the writing process as they continuously evaluate and revise their writing throughout the piece (Cochran-Smith, 1991). Also, it has been discovered that there is carry over from computer-generated essays to handwritten work in that the overall quality established with the aid of a word processor has a positive affect upon future handwritten works (MacArthur, 1988). Bridwell, Sirc, and Brooke (1985) found that college students who used word processing were more concerned with the format of their writing and thus produced higher quality products with the aid of a word processor. In another study, youngsters in sixth grade who used word processing for writing made fewer errors and fewer new errors when moving from one draft to the next (Levin, Riel, Rowe, & Boruta, 1985.) Students' concern with the format of their pieces and fewer errors identified within a written draft demonstrate that the overall quality improves with the use of a word processor. Both of these studies make note of the effect that the word processor had upon students' writing. From these findings one can conclude that word processors provide improvement in the overall quality of a word-processed piece.

#### Increased output of student writing.

The final draft of a student's writing can be affected by the use of a word processor. The length of a word-processed piece has been found to contain more words than a

handwritten piece of student writing (Jones, 1994; Peterson, 1993). This is significant because it can be concluded that students who use a word processor to produce a written piece will produce a piece that is longer than if they would have handwritten the piece initially. In fact, in a study of forty-four high school seniors Peterson (1993) analyzed the difference between handwritten essays and word-processed essays and concluded that students wrote significantly longer essays using word processing. Peterson continued her study to determine what would happen when students switched from writing by hand to writing with a word processor, and then switched back to writing by hand. The results of this study provided some evidence that students may write longer papers when using word processing. This can be considered a benefit to using the word processor because many instructors are influenced by the length of a piece of writing.

#### Learner motivation and writing satisfaction.

Additionally, the word processor has a potential advantage over the paper and pencil production of writing in that students' motivation to write and satisfaction with their written work are increased. Students' attitudes toward writing appear to improve when they have access to a computer word processor (Jones, 1994; MacArthur, 1988; Peterson, 1993; Roberts & Mutter, 1991). Not only do students have a positive attitude toward writing with a word processor,

students also believe that their writing improves with word processing (Bridwell & Ross, 1984; Bridwell, Sirc, & Brooke, 1985; Feldman, 1985; Palmer, 1984). They feel more relaxed with word processing because they have more opportunities to reconsider their texts (Collier, 1983; Feldman, 1985) and they are proud of the appearance of their writing (Bickel, 1985; Lindeman & Willert, 1986). Motivation to write is often mentioned by teachers as a central reason for using word processors, and there seems little reason to doubt the numerous reports that word processing increases motivation (Daiute, 1986). Smith (1985) reported that students who use word processors for the various stages of writing have an improved attitude toward writing in general, tend to make more revisions, write longer papers, and pay more attention to detail. Students are more willing to take chances and "play around" with text as they construct and reconstruct their writing with a word processor (Laidley, 1991). Students' resulting positive attitudes toward writing affect their motivation to write.

One benefit from word processing that has been observed through research on word processing is a change in student attitude. Initially, many students have a negative attitude toward writing due to difficulties in evaluating and revising their work. Often student attitude is affected positively when students are allowed to use the word processor during

process writing. Word processing is less physically demanding of writers, and it takes the recopying or retyping chore out of the production of final drafts and the cutting-and-pasting chore out of revision and refinement of texts (Cochran-Smith, 1991). The word processor frees students to focus on the meaning and clarity of their writing rather than on the mechanics.

#### Increased levels of revision.

The word processor may be best known as a writing tool which allows the writer to revise during and after composition. The ability to revise and edit while composing is one of the most advantageous features of word processing. Students engage in more revision when composing their papers initially with word processing which is one of the primary advantages of computers. Peterson's study (1993) found that students added significantly more words when revising on the computer. This was not found to be surprising due to the fact that insertion is one of the easiest revisions in word processing and one of the most difficult in hand revisions. This type of revision is a surface level of revision which only alters the written piece's number of words. Students also make more structural revisions when originally keying in their essays (Collier, 1983; Dalton & Hannafin, 1987). Structural revisions include cutting and pasting, adding on to, inserting into, and deleting. Word

processing makes it possible for young writers to follow through on their thought processes during composition because adding on to, inserting into, and deleting from initial texts can be relatively easy to accomplish (Cochran-Smith, 1991).

The increase in the levels of text revision from simple insertion to actual rearrangement of text is made easier with the use of the word processor. It allows students the opportunity to revise the written piece with ease, rather than to engage in the laborious task of recopying by hand. These revisions are a means to better writing (Cochran-Smith, 1991).

#### Peer collaboration.

Peer collaboration involves two or more students working together to problem-solve and support each other during the learning process. Collaboration is desirable in process writing because it allows the students to bounce ideas off one another and gain new insights into themselves as learners.

In addition to improved attitude, students' peer-peer interactions are positively affected through the use of technology. Collaboration in process writing entails sharing responses, ideas, drafts, and finished written products through conferences with peers. It is this collaboration that enhances the process of writing as a cognitive and

social interactive process (Allen & Thompson, 1994; Laidley, 1991). These social events cause students to share their writing and assist each other, especially during the editing process (Okolo, 1990). Students, kindergarten through high school, are excited over the idea of using a computer (Peterson, 1993). This excitement for the computer transforms itself into a motivation to work at the computer and write. Motivation and excitement for learning produces situations in which students are willing to share with each other and interact as they develop their computer writing skills. Therefore a circular pattern develops. This pattern is advantageous because it perpetuates the writing process. (The more I write, the more feedback I get, the better I feel about myself, the more I want to write, and so on.) The excitement for writing and learning becomes contagious.

#### Collaboration with others.

Collaboration with others in the process approach to writing entails sharing responses, ideas, drafts, and finished written products through conferences and journal exchanges with teachers and members of the nonclassroom community such as parents and siblings (Hill, 1992; Moore, 1989; Routman, 1991). It is the spontaneous collaboration as students engage in the writing process in a computer lab environment that is beneficial to the student and the written product. Computers foster the development of cooperation and

collaboration between teachers and others during word processing. When students are allowed to move freely among the collaborative computer lab environment and publicly view each other's work some of the following can be observed: teachers and others reading student's work from the computer monitor, students discussing orally the contents of their piece with others, students and teachers exchanging ideas, teachers and students working together to revise or edit on the monitor of the word processor, students sharing information about the word processing program with other students as well as other teachers, and students interacting in a positive manner with others in support of the word processing activity. During this public exchange format, students, teachers, and classroom visitors are able exchange ideas, share responses, and engage in productive conversation that enhances the work of the students (Dalton & Hannafin, 1987; Watt, 1983). One of the most significant effects the computer has upon children's writing may be that its use increases the amount of collaboration (Dickenson, 1986).

#### Research Which Doesn't Support Technology

Most of the research on process writing with a word processor supports its use. Despite the benefits noted, however, there have been some conflicts in the research findings. The discrepancies may be due to the scarcity of research on the writing of elementary school aged children;

there have been only three studies which focused solely on elementary children and their word processing. Elementary aged children are especially important to observe because these are the learners who are in the process of developing as writers. The study of elementary aged children and their revision techniques would greatly add to the body of knowledge already in existence. The research which does not support the effectiveness of the word processor in process writing addresses two issues: (1) frequency of revision and (2) quality of writing.

#### Frequency of Revision

In the frequency of revision studies of students over the age of twelve performed by Daiute (1986) and Peterson (1993), both researchers found that students writing on computers made meaning revisions less often than those using pens and pencils. While word processing offers potential use of extensive and easy revisions of all kinds, it does not lead to increased revision that improves overall quality unless instructional intervention also occurs (Cochran-Smith, 1991). The problem with researching revision techniques is that the keyboardist can make numerous, easily amended, word-level errors while typing. It may be that one of the reasons writers make more changes when they word process is that they make more key-stroke errors that have little to do with the qualities of revision. If every



textual change including typographical error correction is counted as an instance of revision, then it is likely that these increases of revision are related to the orchestration of the keyboard itself and not evidence of qualitative different modes of composing.

### Quality of Revision

The quality of a written piece is only as good as the correction techniques. Daiute (1986) found that, while students tend to make more changes in text when provided with word processing capabilities, these revisions tend to be surface-level changes that affect features such as spelling, punctuation, and length of text rather than ones that improved the quality of writing. The comparisons of handwritten compositions and word-processed compositions in elementary classrooms conducted by Shaw, Nauman, and Burson (1994) indicated that third-grade students' handwritten essays were superior in length and quality. The quality of the handwritten pieces was judged superior because they were consistently longer and demonstrated revisions which improved the written quality of each draft. This study did include elementary children and was conducted over a three year time period although only seventy-two students were included in the study. Due to the limited number of subjects it is difficult to apply these results to all elementary students and their success rates using the word processor.

This analysis of the research that speaks both for and against the use of word processors in writing reveals that there are variables which may affect the results. Thus it is difficult to make comparisons.

#### Variables That Affect the Research Results on the Effects of Using Word Processors

It is apparent that there are several variables that can have an effect on the length and quality of writing produced with a word processor. Some of these variables are:

(1) amount of access to a word processor, (2) quality of the word processing program, (3) teacher attitude and training, and (4) the writer's keyboarding experience. These variables directly relate to the findings of recent and concurrent research.

#### Access to a Word Processor

The biggest problem facing teachers who wish to use word processors to teach writing is not having access to enough computers (Scrimshaw, 1993). Most recently today's schools have increased their demand for computers in the classroom and computers in a lab setting. The increasing awareness of the Internet as an educational tool has prompted educational systems to dedicate more funding for the purchase of powerful computer systems. The ideal situation would be for each student in the school to have a computer. Due to the cost of providing each student with a computer this is often not

feasible (Scrimshaw, 1993). Another access problem is scheduling time in the lab for writing. The computer lab is frequently used by many children from several different grade levels; therefore, finding the preferred time each day or week can be difficult. Limited access to a word processor clearly affects research results on the effects of using a word processor. Students must have access to a word processor to become proficient with its use.

#### Quality of Word Processing Program

The quality of the word processing program used by students directly affects the facilitation of writing. Many computer-based programs are available for a wide range of ages. Each of these programs contains writing tools for the user. Writing tools which may benefit the user include spell checker, thesaurus, grammar checker, cut command, copy command, paste command, find and replace command, and style changes. The extent of the tools available depends upon the program. The quality of the word processing program has much to do with the students' production of quality text (Okolo, 1990). The ability to utilize the word processing tools proficiently also affects the students' production of quality text.

### Teacher Attitude and Training

"Teaching the process of writing without teaching it using word processing is obsolete" (King, 1996). However, many teachers are not able to employ the word processor because they lack the training that is needed. The lack of adequate teacher training directly impacts students' computer use in the classroom (Despot, 1992). If a teacher does not have training in the use of technology and doesn't feel comfortable using technology, the teacher will not convey to their students that technology is worth using. Teachers need adequate preparation time to learn, and teach, word processing through consistent hands-on experiences. The teacher acts as a role model who must be willing to learn first before attempting to teach others the benefits of using technology. The teacher attitude toward word processing can also influence the student's perceptions about using a word processor. It is extremely important that teachers who plan to have their students use the word processor receive proper training and time to develop their own word processing skills before attempting to teach the concepts.

### Keyboarding Experience

The ability to utilize the computer keyboard also influences the effects of using the word processor. Students who have not had proper keyboarding training have been reported as not being as successful in using the word

processor as those students who have had keyboarding instruction. When students begin to use the word processor the question of keyboarding arises because familiarity with the location of the letters on the keyboard allows students to enter words easier and faster. Students who don't know the locations of keys on the keyboard use the hunt-and-peck technique to produce their compositions. This ties up the use of the computer longer than necessary, and teachers worry that children learn bad keyboarding habits that may be hard to break later. The fact is that word processing will and has become a standard method of writing, and keyboarding must become a basic literacy skill.

#### Discussion

Many studies have provided evidence of clear advantages to word processing in process writing. These advantages include greater learner motivation and increased writing satisfaction, increased peer collaboration, and collaboration with others. The word processor has the advantage in that it has become an important and valuable tool for writers.

The areas of "amount of revision" and "quality of the writing" have produced mixed results. Some studies indicate notable increases in revisions with word processing, whereas others indicate that there is little or no difference between the number of revisions students make with word processing and the number they make with paper and pencil. There are

many difficulties in trying to synthesize the research on writing quality and word processing. It is possible that the mixed results in reported research are due to the limitation of the studies or to looking at the results in different contexts. There is limited research concerning the overall quality of writing produced by children under the age of twelve. Certain variables may also affect the results. For example, the quality of the revision may be dependent upon the quality of the word processing program, the teacher's attitude and training as well as the keyboarding background of the student.

It is apparent that there is a need for further research. Future research should include (a) the study of children's uses of the word processor and the effect it has upon the writing they produce in the elementary grades, (b) the study of the different contexts in which those confounding variables such as teacher training and keyboarding experience are controlled, and (c) more participants.

#### Conclusion

It is likely that technology and its use in classrooms will continue to flourish as the need to communicate with the world increases in our daily lives. It is communication which binds us together; therefore, it is our children whom we need to educate and keep current in this ever-expanding

technologically literate world. Our schools' curricula need to include the use of computers. One way to begin immersion in technology is to develop our students' process writing skills through the use of word processing programs. The majority of the research on writing with a word processor has indicated that this writing tool does provide specific benefits for our students and may be used to develop skill in writing. Additional research needs to be done to determine the actual benefits of using a word processor during the writing process. A wide variety of investigations such as examining specific grade levels, levels of literacy development, and actual composing at the computer and so on should be conducted to precisely determine the impact technology has had and will continue to have upon our students and our educational systems. Preservice and in-service teachers need opportunities to explore the many ways computers may be integrated into all phases of the elementary school curriculum.

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