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## Geritol for geriatric computers

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### **Abstract**

This paper looks at the recycling of older computers in an elementary school. With the budgetary cutbacks that most school districts are facing, reusing older equipment is one way to meet student needs and still exist within a tight budget. This paper reflects research done in the areas of keyboard curriculum, which keyboard is used the most, and at what point in a student's academic life should this topic be introduced. The project describes a current development in a local school trying to pool older resources to allow for a better use of these machines.

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# Geritol for Geriatric Computers

A Graduate Project  
Submitted to the  
Division of Educational Technology  
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Master of Arts

UNIVERSITY OF NORTHERN IOWA

by

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has been approved as meeting the research requirement for the  
Degree of Masters of Arts.

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*November 12, 1997*  
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## Abstract

This paper looks at the recycling of older computers in an elementary school. With the budgetary cutbacks that most school districts are facing, reusing older equipment is one way to meet student needs and still exist within a tight budget. This paper reflects research done in the areas of keyboard curriculum, which keyboard is used the most, and at what point in a student's academic life should this topic be introduced. The project describes a current development in a local school trying to pool older resources to allow for a better use of these machines.

## Introduction

The project, Geritol for Geriatric Computers, is the use of antiquated and moderately old equipment in a school setting. As is very common in a school today, budgets are being cut, teachers are being cut, and there just is not enough money to purchase new equipment for either an individual classroom or lab setting. Therefore instead of denying the students access to the technology because buying new is out of the question, it is perhaps wise to look at using older existing equipment in a different setting. Just as the environmental groups around the world urge us to save our planet by reducing, reusing, and recycling, Geritol for Geriatric Computers is a recycling project. It is obvious that the older Apple series or the PC computers with a 286 or 386 processor can not be used with the modern multimedia software, therefore you need to think of other ways to use these machines. This project is to take the current Apple IIs', Apple Ie's, and Laser 128 compatibles that are in a local building and set up a keyboard lab. This school is an elementary school of about 120 student in the grades 3 through 5 including two special education rooms. There are seven to eight classrooms a year depending on the student body for that year. There is a high minority/low-economic population. Twenty machines have been moved into the library in order to create the keyboard

lab described in this project. Not all of the machines have been moved out of the classroom, at least one more modern multimedia capable machine has been left in each classroom. These include both Macintosh and PC compatibles with Internet and CR-ROM capabilities. Based on the age of the machines taken to be used in the keyboarding lab, they will be unable to be networked to the Internet, to run a CD-ROM, or any type of multimedia beyond the basic hyperstudio. Many districts would be tempted to just throw these machines out because they can't "do anything". However this district is taking these machines and previous software to teach keyboarding to students. This way by the time they reach fifth grade, they will be able to do basic word processing which is expected for students as they move onward to middle school and definitely by the time that they reach high school. Hence, our students will have an edge and be knowledgeable about the basics of word processing. With all of the added features of the fancier window based word processors, you still use the same type of basic word processing procedures to cut, paste, print, and format. The difference is really just how you perform these tasks. Therefore learning the word processing basics with one program is transferable to any other program, leaving the student with just learning some new commands that are in the new program. This project is important because it shows a way to save money in the school district by finding a use for older equipment. The money saved can then be used for other things. This may



include putting in an Internet lab, to replace or upgrade other equipment so that the students would have the Internet/multimedia technology available to them in the individual classrooms. It is also important because the reuse of older equipment is a logical answer to the question of: "What do I do with this?".

## Literature Review/Method

The procedures used in developing this project started out with a look at the literature. This research covered the areas of when should keyboarding be taught, whether the elementary setting is the appropriate place to begin the instruction and also what type of instruction would achieve the best results. It then proceeded to the areas of curriculum development and its integrated parts.

### Type of Keyboard

The first area explored was the type of keyboard that should be used when teaching keyboarding. There are two types of keyboards: the Dvorak and the QWERTY. The Dvorak keyboard is built around the frequency of letter usage. QWERTY keyboards are the standard typewriter keyboard which has been around for years. In all the literature, it appears that the QWERTY style keyboard was the type that was used due to references to a standard keyboard (Cantalupi, 1991 and Buchanan, 1993). Since the ultimate goal as a teacher is to see students prepared for the world they will be a part of, probably the best keyboard choice is the QWERTY since that is the style used by business and industry.

### When to Introduce Keyboarding

In regards to the question of when to teach keyboarding, the one agreed on fact was that keyboard instruction should begin at the elementary level (Cantalupi,

1991). The reason was because this is the place in the student's academic life where incorrect habits in regard to keyboarding are made. Boyce, (1992), stated that we should ignore grade levels, but that we needed to look at the curriculum and then make certain that we teach keyboarding before we would expect "consistent use of computers for more than yes/no answers" (p.3). Generally grades three and up provide the most success in the area of keyboarding. This is partially due to the physical development of the span of their hand and partially because of the increase in the attention span of student beginning at third grade helping them to cope with the necessary repetitiveness of the practice. Kaser (1984) stated that students in grades K-2 would be having problem with keyboarding because "their attention span is too short for proper learning of the keyboard and their hand size and level of finger dexterity were drawbacks"(p.16). A survey conducted by Kimbal and Lane in 1989, as reported by Cantalupi (1991), consisted of one elementary and one junior/senior high teacher in every state. They were asked the question of when should we start keyboarding. Half of the respondents to that survey stated third grade. Waner (1992) stated that keyboarding needed to become automatic if it was going to be of any help to the students. She addressed the need to teach keyboarding one grade before students will need it in their work. Finally the rationale used for explaining why it should be taught at the elementary level was that keyboarding was a communication skill and therefore should be placed in the

elementary curriculum. However, Waner suggested that elementary teachers felt that keyboarding conflicted with the whole language theory and developmental appropriateness. Actual experience with the use of keyboarding skills with some students may, in fact, result in their sense of success with writing.

### Keyboarding Curriculum

The next area in this project is the development of the curriculum. The literature was consistent in the idea that in order for these skills to become automatic and therefore to be useful to the student, it was imperative that there be daily practice (Buchanan, 1993). Boyce (1992) stated that the introductory course on keyboarding should consist of 25 hours. This would calculate into daily lessons of 30 minutes which suggests that a teacher block out a 45 minute time period. This time might be needed to allow for the students to settle, distribution of the material, actual teaching, and clean-up, so that the class is ready to move on at the end of the time slot. If keyboarding is to be taught for only a half a year, then one quarter of the school year is to be devoted to the mastery of the alphabet and the other quarter of the school year would be used for its practice by the use of writings. Cantalupi (1991) quoted Somunen who stated in 1988 that keyboarding in an instructional block of less than fifteen minutes is "an inadequate amount of time to develop an efficient keyboarding skill" (p.29).

This could present a problem in schools in regard to the size of the class and the number of classes that need to be using the lab. Even though these projects involve using older machines that are not multimedia capable, it is very difficult to find 35 of these machine in one small building. In the district, the class limit is 32 students which makes it very difficult to locate that number of computers so that every student has one to work on. One possible solution to the mismatch of students to computers was worked out in a study done in a private elementary school in the mid-East United States as reported by Nichols(1995). She had ten Apple IIs' in a lab and for a class to actually have at least thirty minutes of keyboarding, the students were paired up at the computers. One student would actually be doing the keyboarding on the screen while the other student would be practicing keyboarding skills on a template. Students would switch later so that both would have a chance to be on the machine. The student that is off to the side would at least have been practicing along with the keyboarding. A major drawback to this is that the student with the template would not be seeing what is being typed and may make errors in movements. Nichols suggested that the software should not be preloaded. The students need to be able to load their own programs, making them more assured of their computing skills. The only time to preload a program would be if the scheduling of the lab was so tight that the class would not be able to get

their needed thirty minutes of typing time. Once again this concern is directly tied to the number of classes in the school and the amount of available time to use for scheduling in the lab.

One case study discussed the results of using two different teaching methods in keyboarding (Nichols, 1995). One method was called the Diana King method. In this strategy, the instruction is teacher-led. The teacher gives the examples, walks around the room to check for correct fingering and body position, and collects the students print outs to be checked later by the teacher. There was no specific computer program used with this method, just the word processor program available. A stiff paper was used to cover the keyboard. The course took twelve weeks to teach the alphabet. At the end of that time, a final test was given, scoring words per minute and accuracy.

The other method used a computer tutorial called Type to Learn. In this situation, the student logged on and went through the listed tasks. After about fifteen minutes, the first student would log off and switch with a partner. This method also used the stiff paper cover over the keyboard. At the end of the part of the course which covered the alphabet, the same final test was given to this group of students as was given to the first group. However, this method took 21 weeks to cover the same amount of material that the Diana King method did in 12 weeks.

The reason suggested for this was that the students lost time in logging on and off twice a lab period to accommodate the partnered workstations. The warm-up review exercises in the computer program were mandatory, the student could not bypass them. In the Diana King method, there were no warm-up screens or logging on/off because an ordinary word processor was used. Therefore the lessons might start right away since the teacher is in charge of when to start. In the Type to Learn model, the student was slowed even more after the sixth lesson since the program interrupts the lesson to show the word per minute rate of the student.

The results achieved from this study showed positive attributes of both methods. The students who worked with the program had a much higher word per minute rate than the Diana King method. However, the students in the Diana King method had a greater accuracy in their typing than the Type to Learn group. The major reason for the difference between the speed and accuracy of the groups is found by looking at what was stressed in the teaching of the curriculum.

In the Type to Learn curriculum model, the student were told how fast they were typing after the sixth lesson. Therefore, these students knew how fast they were going, but the tutorial never told them where their errors were. The student would hear a beep when an error was made, but they received no feedback as to why the computer beeped. Since there was no feedback, these student were

unaware of the need to correct themselves. In the Diana King method, there were fewer errors because at the end of the daily lesson, the student would print out their work which was corrected by the teacher. The students got the feedback about their accuracy which allowed for them to make corrections in how well they were typing.

The one area of information that the students in the Diana King group did not get, though, was the rate in which they were typing. Therefore by looking at what each method stressed it becomes very obvious as to why each group excelled in the areas that they did. A critical decision which must be made relates to which aspect to stress, accuracy or speed, or a combination of both, before the curriculum approach is selected.

Buchanan (1993) worked with lower elementary students in the K-2 grades. She discussed the phases of training that she gave her students. The first phase was the general body and finger position with the location of the home row. This then led to the next phase where the students learned the location of individual letters. Once the entire alphabet had been taught, the teacher then progressed to common words, simple phrases, and short sentences. Finally, the student would move into the more complex activity such as copying from a book, paragraphs, and composing at the keyboard. However, what was interesting was that she combined the teacher directed instruction, such as described in the Diana King model, with a computer tutorial. Due to the age of her students, she chose a talking tutorial called



Talking Text. However, because this project focuses on the geriatric computer, it must be kept in mind that talking text will be unavailable because these machines are equipped with those options. Money for installing sound cards into the machines and running some type of sound speaker like the Echo Sounder through it might result in them becoming "talking". This would counteract the idea of using older machines to save money.

The idea of developing the curriculum to include both computer tutorials and teacher direction gives the student the best of both worlds. It also helps reach all student learning styles by using visual, oral, and tactical aspects of learning. Boyce (1992) felt that the mastery of the basics using a touch system for both speed and accuracy is the most effective. The Association felt that document formatting should be kept to a minimal because the elementary level was not the place to introduce more advanced processing options. After basic letter location is learned, the only way to make certain that the students do not lose these techniques is to practice. The most creative way to accomplish this is by the use of cross-curricular writing assignments. In this way the keyboarding skills are tied to other subject areas.

Definite goals and objectives have been developed by the National Business Association (Cantilupi, 1991). Goals stated by the Association included the mastery of the basic skills of correct body position, fingering, speed, and accuracy.

Keeping the eyes on the copy to discourage the hunt and peck is a difficult skill for students to achieve. The desired elementary goal for speed and accuracy would be to keyboard at a rate of 25 words per minute with two errors. It is recommended that students not be instructed on the use of the "delete" key until they can type at a rate of at least 20 words per minute. This is very difficult to do because of the availability of the computer at a younger age, many students already know about that key and its use. Another key that is recommended to delay instruction on is the "caps lock" key. Both of these keys actually slow the students down in their typing. Other than these two keys, the rest of the keyboard should be taught at a rate of two new keys per lesson along with reviewing previously learned letters. The Association endorses the idea of not stressing accuracy until the students have reached the desired rate of 25 words per minute. Once that rate is achieved, then the stress goes in to being accurate. The subskills of the goal of keyboarding are technique, speed, and accuracy. The hardest one, accuracy, would be the last one to master. In order to help achieve these subskills, some reinforcement is important. Recommendations include the use of familiar copy, something that the students already know or read, because it is easier to hone the skills on copy where expectations next in the story are addressed. They need to retype the same copy at least four times, but only to count the accuracy on the last two times. Typing can be tiring, so type fast for fifteen seconds then take a break before continuing helps to

build endurance and concentration. Correct positioning at the keyboard means that the fingers are curved and not at an angle. This allows for the keys to be pushed directly down by the finger tips. It also includes the use of the thumb for the spacebar and the little fingers for the return and shift keys. Developing a rhythm of alternating the right hand and left hand sides will help the students keep up a pace. Familiar copy helps and this fast typing would need to be repeated twice with the same copy. It is recommended that you have five or six different copies and merely rotate among them to avoid the possibility of students becoming bored.

After instruction is progressing smoothly, the final step is evaluation. Cantilupi (1991) stated that formal grading is difficult because “the purpose of elementary keyboarding is not to measure a student’s productivity”(p.29). However there is a lot of difficulty in evaluating if the student is not measured by the product produced. So other methods would need to be employed. Areas that might be assessed include correct techniques of the fingers and body, the rate of typing, number of missed words, and proofreading. These areas do not assess the finished product but they would be assessing the parts that helped create that product.

In the project, Geritol for Geriatric Computers, two MECC software products. One is called Communikeys and the other is MECC Keyboarding. Since these are MECC products, there are teacher options as part of the management setup of the programs. In the options areas, the teacher would have the control over

the acceptable word per minute rate, the acceptable accuracy, and to view and keep track of student performance. These options allow the teacher to increase the difficulty level of the tutorials as students improve. These would work as the computer tutorials, keeping in mind the research that indicated for the best achievement use of both the teacher directed and computer tutorial methods of instruction is essential. The Carson-Dellosa Publications will be used for practice work (Appendix A). This allows for copy to be practiced for correct techniques. It also helps the teacher out since the speed that a teacher talks varies and slows down as they try to come up with examples or ideas. This way a teacher could read the page to the students for oral practice and be able to maintain a more consistent rate.

### Project Description

This project was to take the current Apple IIe's, Apple IIgs', and Laser 128e compatibles into the library to set up a keyboard lab in the back of the library. The lab will be configured in the familiar U-shape design with twenty machines, five printers, and two flatbed scanners. The computers will be linked via switch boxes to the printers. All of this is previous equipment owned by the district that has not been used very much. One Apple IIgs will be selected to be the "teacher's" machine. This machine will be connected to all of the other computers by using a monitor controlling switch center, using an RCA plug to switch to alternate video ports. This will allow the teacher to freeze the screen of any student or the whole class. The student will then view what is on the teacher's monitor. This has been shown to be effective in demonstrating to students how to work a skill directly in the program itself. The teacher can elect to inform students this is happening, instructing students to follow directions. If the teacher needs to see what a student is writing at a computer in the back of the lab, he/she would have a couple of choices: 1) ask the students what they are typing, which can be very disruptive,

2) get up and walk back to see, however teachers know that especially in the elementary level when you move all the heads turn to see where you are going so this again becomes disruptive,

3)use the monitor switch center, the teacher can flip the switch of the computer in question and see on the teacher's computer what that student is typing. Using the switching devices keeps the student from altering or deleting what is being typed, but it would allow the teacher to view it first in order to decide if it is necessary to go back to the student.

Once keyboarding has been taught, the next phase is the practice part of the student's lab time. We would be using Appleworks 3.0 as the word processor for the cross curricular writing assignments. The choice of version 3.0 is that it has a spell checker and that it is part of all current word processing programs. The Appleworks would be available on both a 3.5 inch disk and a 5.25 inch disk. The reason for needing both is that the Apple IIe's and the Laser 128e's do not have a 3.5 inch drive. It would be expensive to add drive cards and buy 3.5 drives for all the Apple IIe's. The Laser 128e's would not accept a 3.5 inch drive and can not have any new drive cards added. Students who are more adept with computers perhaps from previous experiences at home, would be assigned to use the 5.25 inch disks because in that format there is a swapping of disks in order to get the program to run. These students would be the most able to deal with that exchanging process. Less computer literate students would be given the 3.5 inch disks because the whole program is on one disk and does not need to be swapped with other disks.

### Conclusions and Recommendations

The conclusion gained from this project is reinforcement to the fact that just because something is old does not mean that it is useless. Just as we find treasure in antiques, we can still find a use for the older equipment, we just have to look at what use. Current economic restraints may prohibit schools from buying new equipment. The research done indicated that elementary age is definitely the place to begin keyboarding with a stress on the basic finger and body positioning in the third grade expanding to a minimally formatted word processing document by the end of fifth grade. Of course this timeline would need to be adjusted to account for the differences in class size and class make-up since no two classes are the same for any teacher. However by the end of fifth grade, students would be able to keyboard and accomplish basic formatting of documents. The technique best suited for teaching keyboarding is to first use teacher directed sessions followed up by computer tutorial practices. The literature recommended stressing correct positioning first followed by speed and accuracy in that order (Boyce, 1992). Although the research indicates that the Type to Learn method improved the speed of the student's keyboarding and the Diana King's method improved accuracy levels, in reality all of the students need to have both of these skills. Therefore by combining teacher directed instruction and computer tutorials, including teacher

corrected work, the student will be gaining the most they need to become successful at keyboarding.

Perhaps the biggest drawback to using this plan in particular settings is that there are no staff members who have received training in teaching keyboarding. There are teachers who use keyboards, but some teachers have had typing classes whereas others have not. If you are going to use older equipment to create a keyboard lab, you need either one person who can run the lab and be trained in keyboarding techniques or you need to train the classroom teachers in the appropriate methodology of teaching keyboarding.

What then lies in store for older labs in the future? The machines that are being put into this keyboard lab will eventually wear out. When it becomes economically cheaper to replace than to repair, the decision to replace these machines with older Macintoshes will need to be made. The software would then need to be changed from Appleworks to Clarisworks. Both software programs are published by the same company. The lab would be used for keyboarding as a main focus, but it may become a resource for remediation in math and language arts as well. The curriculum designed for this lab currently is not very extensive. A data bank of writing ideas that would incorporate the cross-curriculum activities done in the classrooms would be a desirable addition at a later date.



As the computers become more sophisticated, we will always be faced with the problem of what to do with the older equipment. The computer platform will change, but the idea of needing some type of a pick me up, or Geritol, for older geriatric computers will not be eliminated. Educators need to look at ways to use existing equipment for as long as possible in order to get their money's worth. Geritol for Geriatric Computers is one way.

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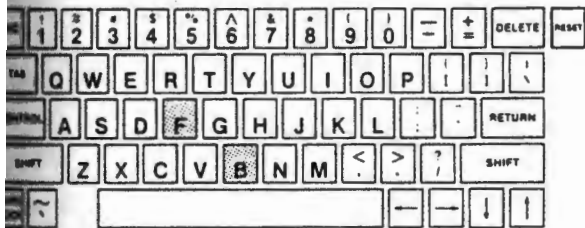
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# LESSON 21 THE B KEY



Use the F finger.

## 21A WARM-UP REVIEW

- 1 ,,, k,k cats, dogs, camels, giraffe
- 2 monkeys, lions, tigers, and snakes,
- 3 Dear Joe, I saw a monkey walk here.
- 4 Dive in the cages; do it for seals.

## 21B THE NEW KEY—B

- 5 ff bb ff bb ff bb ff bb ff bb ff bb  
ff bb ff bb ff bb ff bb ff bb ff bb  
ff bb ff bb ff bb ff bb ff bb ff bb
- 6 ff bb ff bbf ff bb ff bbf ff bb bbf  
ff bb ff bbf ff bb ff bbf ff bb bbf  
ff bb ff bbf ff bb ff bbf ff bb bbf
- 7 bbf bbf bff bff fbb fbb bbf bbf bbf  
bbf bbf bff bff fbb fbb bbf bbf bbf  
bbf bbf bff bff fbb fbb bbf bbf bbf
- 8 fff bbb fff bbf bbf bbb fff bff bff  
fff bbb fff bbf bbf bbb fff bff bff  
fff bbb fff bbf bbf bbb fff bff bff

## 21C BUILDING WORDS

- 9 b b b bake bake bend bend tube tube
- 10 b b b boot boot band band cube cube
- 11 b b b buck buck bond bond bear bear
- 12 b b b table table tab tab tuba tuba
- 13 b b b bat bat black black born born

## 21D SENTENCES

- 14 Big, black boots are at the bottom.
- 15 The black bat flew through the tub.
- 16 A baby bear was born in a big boot.
- 17 Bo Baker baked a cake at the table.
- 18 A rubber balloon flew out the back.

## 21E LET'S CHECK

- 19 Those fish swam swiftly through the
- 20 glass bowl. The old cat sneaked up
- 21 on the little black fish in a dish.

1	2	3	4	5	6	7
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“How do you check out? Feet flat?  
Eyes on book? Fingers curved?  
Back straight and forward?”