

APPENDIX C: Keyboarding Skills: When Should They Be Taught?

With an enormous computer presence in schools, the question is no longer whether to teach keyboarding but when to teach it.

President Bill Clinton and Vice President Al Gore have challenged the nation to ensure that all children are technologically literate by the 21st century. A "pillar" of this challenge is, "Modern computers and learning devices will be accessible to every student." With computers accessible to every student, most teachers and experts in education say the teaching of keyboarding is a given. But *when* is the best age to teach students proper keyboarding technique?

The Best Age?

"Most research supports starting students on formal keyboarding around grade 4," says Theresa Tovey, occupational therapist in Region #4 (Chester, Deep River, and Essex) in Connecticut. "All kids do not have the eye-hand motor coordination to learn keyboarding skills earlier than that."

"That isn't to say that nothing can be done with keyboarding before grade 4," Tovey continues. "It's good for students to get familiar with the keyboard in the earlier grades. We encourage students to pretend there's a line down the middle of the keyboard and to keep the right hand to the right of the line and the left hand to the left. We also encourage them to type with more than one finger because they may tend to use just the index finger. For later instruction, it's good for students to develop the habit of using more than one finger early on."

An informal look at school Web sites and listservs on the Internet indicates that much formal keyboarding instruction in schools begins at third and fourth grade or later, although there are, of course, exceptions. Other schools begin formal keyboarding classes in grades 5 through 8.

Theresa Tovey believes one reason to wait until 4th grade to teach keyboarding is that students need to develop handwriting skills as well. "Some people would say that handwriting is practically obsolete, because of the computer, but learning how to write is a necessary motor exercise," she says. "You can de-emphasize handwriting, but you can't bypass it or you lose something in developing eye-hand coordination."

Other educational technologists are more adamant about teaching keyboarding at the lower grades. "If you combine keyboarding with letter-recognition and hand-eye coordination activities in grades K-3, then you provide a developmentally appropriate skill that helps reinforce classroom learning and develop fine motor skills," Vic Jaras, technology coordinator for the [Battle Creek \(Michigan\) Schools](#), told Education World. "To wait is to deprive the student of a foundational skill."

Tips on Teaching Keyboarding

Once you've made a decision about when to begin keyboarding classes, a host of other problems involved in actually teaching keyboarding arise.

One of the most difficult aspects of computer keyboarding for students is to look mainly at the screen, rather than the fingers, while typing. Teachers experienced in teaching keyboarding make the following suggestions:

- Put a cloth over a student's hands that completely obscures the keyboard, and have the student type while the cloth is in place.
- Secure a plain piece of construction paper (about 12 by 18 inches) to the keyboard so it covers the student's hands while he or she keyboards.

Another aspect of teaching keyboarding that can be even more problematic than the mechanics is the grading of student performance. A teacher from a school in which formal keyboarding instruction begins in 5th grade says keyboard practice is graded on accuracy, speed, and "the four:" sitting up; having feet in front, on the floor; looking up more than down; and using the home row keys.

In this class, a speed of less than 15 words per minute on a timed test would earn a C, because that is the speed of normal handwriting. Typically, 25 to 30 words per minute or more earns an A, assuming that accuracy is high and "the four" have been performed.

Other teachers use a more highly specific approach to grading. "I teach a two-semester course for 9th graders in keyboarding and the Internet," says Diane Boyle, a teacher at Ygacio Valley High School in Concord, California. "The grade is based on timed tests, participation, technique, and their assignments on the Internet." Technique is graded according to a checklist worth 20 points:

- eyes on copy - 4 points
- arms at sides and still - 2 points
- wrists straight - 2 points
- sitting up straight - 2 points
- typing without pausing - 2 points
- sitting centered at j key, feet flat on the floor a hand-width apart - 4 points
- hitting return key with little finger without looking - 2 points
- keeping fingers on the home row - 2 points

Students are rated on each item on the checklist, and then scored. From 18 to 20 points earns an A, 16 to 17 points earns a B, and so on. Grading systems like this, teachers maintain, enable students to focus on specific keyboarding skills and to know where they stand in relation to skill development.

Other teachers use a formula to determine students' grades. For example, a middle school student who keyboards 25 words per minute with 90 percent accuracy earns an A.

Virtually all teachers and administrators whose Internet material was reviewed advise emphasizing accuracy over speed.

"Have fun with keyboarding," is the advice many teachers give their colleagues. Here are some ways one teacher suggests to inject a little fun into a keyboarding class:

- Turn off the lights in the classroom; students get a kick out of the glow from the computers.
- Turn off monitors and have students type for three minutes; have students compare their results, just for fun.
- Have students type a sentence or series of words backwards.

None of these lighthearted approaches should be graded, but students should be encouraged to maintain as much accuracy as possible in their keyboarding.

A Point To Ponder:

According to some in the computer field, voice-recognition systems will someday replace the need for keyboards. *So, are keyboarding skills essential?* they wonder. Others argue that such systems are a long way off and that schools, which tend to lag technologically behind business, will not have computers equipped with voice-recognition systems for a long time.

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Related Resources

- "Introducing Early Keyboarding Skills: Who, What, Where, and How?," *Business Education Forum*, October 1996. This article discusses introducing keyboarding at an early age.
- *Elementary/Middle School Keyboarding Strategies Guide*, National Business Education Association, Reston, VA. The topics in this guide are wide-ranging, covering different strategies, including teaching special needs students. Price: \$24 (nonmembers); \$12 (members). Telephone 703-860-8300 or FAX 703-620-4483.

Internet Links to Keyboarding Information

- [Elspeth Sladden @ The Learning Studio](#) Elspeth Sladden writes eloquently about her work with "children who have a special need for the computer, whether their difficulty lies in language processing or with non-verbal aspects of learning..."
- [Reviews: Keyboarding Software](#) Two samples of keyboarding software, one for grades K-3 and another for grades 3-adult, are reviewed.
- [New Keyboard Opens the World of Computers to Young Children](#) For those interested in having preschool children learn about computers, a product called My First Keyboard may be a solution.

APPENDIX D: *Teaching Keyboarding -- When? Why? How?*

"Many teachers think it takes nothing to teach keyboarding, but they are wrong," said teacher Carla Cruzan. "Can anyone teach a science or math course?" Are you a classroom teacher who is also the keyboarding instructor? Then discover in this article everything you need to know to make keyboarding instruction a success! Included: Tips and online resources for teaching keyboarding!

Once upon a time (not so very long ago), many high school students took a course called typing. The course was probably taught by a business ed teacher trained in the best method of teaching students to type quickly, accurately, and with correct technique. Few students -- with the possible exception of those aspiring to business school -- paid any more attention than was absolutely necessary to pass the course. Consequently, the hunt-and-peck method appears to be the technique of choice for many adults today.

Times have changed. Schools can no longer prepare students for the workplace of the future without providing them with skills necessary for using computers competently. One of those necessary skills is, of course, keyboarding.

Unfortunately, as schools have concentrated on teaching students how to use computers to obtain and produce information, they have paid little attention to teaching them how to type on the keyboard quickly, accurately, and with correct technique. In addition, some unforeseen questions have arisen. If we need to teach keyboarding -- and we do -- when do we teach it and who should teach it?

Your Youngest Students

"What I am seeing now," computer science teacher Carla Cruzan told Education World, "is that there is no getting around the problem of young children being placed in front of keyboards. There is no longer an ideal time for formal instruction because younger and younger children are imitating older siblings and parents by wanting to work with computers, and more software is being developed just for them," explained Cruzan, a teacher at Southwest High School in Minneapolis.

"At some point, it simply becomes a matter of children being too young in their physical development to receive formal instruction," added Cruzan. "Remember that, in the earlier years, students are developing their larger muscle groups. Later, when they begin to develop the small muscle groups, they learn to print, write cursively, cut with scissors, and so on. I understand that pre-K children are using computers. My concern is that they are not yet developmentally ready for touch typing and will develop bad habits which will be hard to break."

When to Begin?

So how young is too young? "In our district, keyboarding skills are taught in the middle school in fifth and sixth grade as part of the computer rotation," where technology facilitator Jenn Marie told Education World. "Formal keyboarding is not taught in the elementary building. Instead, the children use computers and various productivity programs, and in their use of these programs, from first grade on, the hunt-and-peck method is used.

"In first grade," Marie added, "the children may start by typing their name -- letters they know very well and now need to find in the strange land of QWERTY. Children are encouraged to use two hands -- to use the left hand for the letters on the left and the right hand for the letters on the right. The keyboard is really not designed for accurate use of typing skills by young hands, however. By middle school, the children have the pinkie reach needed."

Laurie Patterson, a technology integration specialist at Lakeview School in Tyngsborough, Massachusetts, taught keyboarding for 12 years at Detroit Country Day School in Bloomfield Hills, Michigan. "I did formal keyboarding instruction in third grade; in fourth and fifth grade, students were expected to have their hands on home row keys with proper form when they typed any of their assignments," Patterson told Education World. "I did do a four-week review of keyboarding for the fourth graders, but beyond that, instructional time was not used for the skill and drill of learning the QWERTY layout of the keyboard. Instead, children were provided with meaningful activities to complete on the computer. This type of real-life practice and encouragement from teachers to use two hands helps children become competent typists.

"To me, it makes more sense to practice typing by actually typing reports, stories, poems, and so on," Patterson told Education World. "It's just like drilling math facts. You might teach addition facts in second grade and even drill them into the students each day. But by the time they get to third grade, you are no longer drilling students on addition facts. They are expected to know those facts and use them during math. The same is true for keyboarding. Students should learn the proper form (with drill) in third grade; they should be expected to be able to use those skills in fourth and fifth grade."

Who Should Teach Keyboarding?

"We've had a full-time elementary keyboarding teacher in our district for close to 15 years," Craig Nansen, technology coordinator for Minot (North Dakota) Public Schools told Education World. "We did a lot of research before implementing that plan. At that time, [we brought in an expert in the field] to help us implement our elementary keyboarding program."

That expert "made a believer out of me," Nansen said. "I used to think anyone could teach keyboarding. He showed us that a lot of research had gone into the order of introducing the keys to develop motor skill memory. Most software programs and elementary teachers ignore this research and introduce the keys in a manner that allows them to spell words or play games. I cringe during these discussions but keep my mouth shut and my keyboard keys still."

"Most K-8 teachers have no vocational certification in teaching keyboarding," agreed Carla Cruzan, "and students need feedback. The software responds to the key pushed. It doesn't know which finger the student used to push it. The real key to keyboarding is technique, and the theory for this pedagogy is in the realm of teachers certified to teach the subject.

"Many teachers think it takes nothing to teach keyboarding," Cruzan noted, "but they are wrong. Can anyone teach a science or math course? It's the same with keyboarding. Keyboarding is an important psychomotor skill that all students need to learn, but that fact is not being recognized. You have no idea how hard it is to untrain students coming to us at the high school level with poor technique. As a result, many students will never be good at composing straight to the computer because they can't take their eyes off the keyboard and keep them on the monitor or text! I understand that in some states, vocational certification is changing to K-12. That is a very good thing!"

What If You Are the Keyboarding Teacher?

What if your school isn't lucky enough to have an elementary keyboarding instructor? What's a classroom teacher to do?

"In our elementary keyboarding classroom," Craig Nansen told Education World, "we have a sign that lists the top ten goals of keyboarding instruction:

1. Technique
2. Technique
3. Technique

4. Technique
5. Technique
6. Technique
7. Technique
8. Technique
9. Accuracy
10. Speed

"Keyboarding is a motor skill," Nansen noted. "It is a matter of training fingers to respond correctly and quickly to press the correct key -- kind of like in athletics where you keep doing it over and over again until it becomes habit.

"Years of research have been done on the correct way to teach these skills," Nansen added. "This research found the drills dealing with key combinations not only to develop these motor skills the quickest way but also to develop those skills so they won't be lost. There is a reason for those fff fjf jff jff drills."

"My emphasis is on proper form not speed," agreed Laurie Patterson. "Let me explain what I mean when I say proper form. My students are expected to have their hands on home row keys, to use the proper finger for each letter, to have their wrists flat and their thumbs on the space bar. And they are expected to know where the keys are without looking. Often I cover the keys so they can't look. I monitor them, watch them closely, and model for them constantly.

"I set a goal of three words per minute for third graders and around seven for fourth and fifth graders," said Patterson. "I lower it or raise it depending on the success of the individual student.

"My emphasis is not on speed," added Patterson. "I don't want to frustrate students by raising the speed beyond what they can manage, forcing them to have to look at the keys in order to be successful."

"If you put pressures on students at this age to attain speed and accuracy, I think you will be doing kids a big disservice," said Carla Cruzan. "Speed is not what is most important. Most important is correct technique. With correct keying, speed will come automatically with time and use. Accuracy will come automatically by letting up on the speed. Emphasize correct technique only at these ages."

Where Do You Begin?

"When we begin to study a physical skill, we must concentrate upon it," Lauren Eve Pomerantz, programs coordinator at the California Space & Science Center, told Education World. "Then the information is stored in the neocortex, the center of our conscious thought. As we perfect our skill through physical drill, whether it be piano scales or ballet barre exercises or DeNealian drill sheets or karate katas, the information is moved into deeper areas of the brain that bypass conscious thought.

"The true measure of the typist or keyboardist is that he or she no longer thinks, 'I must press my fourth finger on my left hand without moving up or down,' but thinks 's' and the finger responds automatically," Pomerantz added.

"Look at how anything complex is taught," Pomerantz pointed out. "We take words and break them into phonemes to teach reading. We take dance and break it into sequences of steps to learn ballet. We take music and break it into scales to learn to play an instrument. Knitters make squares in a pattern until they are ready to incorporate it into a project.

"In typing, first you learn where the keys are and how to stroke firmly and rhythmically," Pomerantz continued. "Then you learn to combine letters into words. Along the way, you learn certain common patterns. Not very long after beginning, when kids are still thinking about the letters that make up each

word, they can type such words as *the* and *and* because drills make them repeat those commonly used sequences.

"I would suggest that if you type words with meaning while learning to type, you are thinking about two things, the meaning and the motions," Pomerantz said. "This interferes with learning. Imagine trying to concentrate on emoting while doing barre exercises or on style, substance, and character development while practicing handwriting."

More Drill

"Initially, students get much of the psychomotor feedback they need --feedback that they have struck the correct keys -- as they watch their monitors," Carla Cruzan said. "However, in the very beginning stages, they also need to occasionally look back and forth to their keyboards to develop their eye-hand coordination. When students switch to copying text off a printed page -- if it is introduced too early -- they struggle to keep their eyes on the text, and they lose this important feedback. Switching their eyes constantly between text and keyboard, they also lose their place in the text and numerous errors creep in. The same thing happens when they compose straight to the monitor. This frustrates the natural eye-hand coordination process of learning the keys.

"The initial keyboard learning is a once-in-a-lifetime opportunity for students to look at the keyboard as needed," Cruzan added. "Students need to learn to key at their own pace or the developmental process will be frustrated. Ignore all errors at this time -- except for errors in technique. Let your students know that their typing will always contain some errors. What will change, with time, is the type of errors they will make."

More Tips

Cruzan continued: "Explain to students that the memory is in the muscles. Use an example such as riding a bicycle. Tell them that once their fingers learn the keyboard, the fingers will not forget, just as they will never forget how to ride a bike once they have learned. Tell students to be patient with themselves; they are training their finger muscles to remember the position of the keys. This is why it is important to sit up straight, keep their feet flat on the floor and their keyboards at the proper height and adjustment -- so the fingers always approach the keys the same way. It is part of muscle memory -- just as golfers try to develop their swing.

"To avoid carpal tunnel syndrome," Cruzan said, "learners must keep their wrists straight -- no breaking at the wrist, either up or down. This is only possible if the keyboard is at an ergonomically correct height. A penny placed on the back of a hand while keying should remain there if the wrist is straight.

"Teach students about what I call 'nubbies' (the raised dot in the center of a key or the dash at the bottom of one) on the keyboard's home row," Cruzan added. "They are placed differently on different keyboards and may be on either the two index-finger keys or on the middle-finger keys. These provide 'subliminal' feedback to students as to whether their hands are placed correctly on the keyboard. Errors occur if hands are not on the home row.

"Remember the developmental process of learning to keyboard," Cruzan said. "Students learn initially using subvocalization, so they shouldn't listen to music or talk too much during this time; it will interfere with the subvocalization process, which is important to their learning."

"It is also very important that all the other teachers in the school are supportive of the keyboarding class and insist that the students have their hands on home row keys and use correct form any time they are typing," noted Laurie Patterson. "Without this support, the keyboarding program is apt to fail. It is especially important in fourth and fifth grade, where the hunt-and-peck method still seems easier to the students because they are not as fast as they'd like to be. Keyboarding cannot be taught in isolation.

Students need to know they are expected to have their hands on home row keys every time they are typing at the computer, not just in keyboarding class.

"Many parents, administrators, and teachers can't seem to justify the time it takes to teach keyboarding," Patterson concluded. "They feel that schools shouldn't take the time to teach keyboarding at all -- or they think keyboarding instruction should wait until high school. My response to that is this: We don't expect our students to write until we've taught them handwriting; we can't expect them to type if we haven't taught them keyboarding."

Keyboarding Resources

- [Proven Techniques for Teaching QWERTY Keyboarding](#) Jill Hallows, a former K-8 keyboarding teacher provides this printable booklet with information and activities about positioning, memorization, and motivation in keyboarding instruction.
- [Technique](#) This site contains a checklist of the specific components of proper keyboarding technique as well as activities to help your students learn correct technique.

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