Start think-keying

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Can you write as fast as you think?

Many people are not as productive as they could be because they are using old technology such as pencil and paper, or they are using new technology inefficiently by 'hunting and pecking'.

This paper describes the evolution of a program to enable people to become proficient in basic typing as quickly as possible and with the minimum of pain.

Communicating words via an electronic keyboard is an everyday fact of life. For convenience people often refer to what they are doing as 'typing', even though they are not using a typewriter. The basic keyboarding skills are the same whether one is using a manual typewriter or a computer.

Because the skill of typing has traditionally been denigrated, the majority of people learning to use computers in Australia have resisted learning touch typing. One can make the analogy that car drivers do not look to see where the brake pedal or gears are - if they did, the results could be quite spectacular.

We teach people of all ages to acquire skills and encourage them to practise in order to hone those skills, be they playing a musical instrument or playing a sport -- and yet many teachers think there is no need to teach their students to touch type and think-key.

We all know that habits are easier to learn than alter, so why do we allow our young people to become functional cripples, disabled by virtue of an inability to key in fluently?

The answer is not a simple one. In part it is due to the lack of understanding of the complex psychomotor skill of typing. It must also be said that the teaching strategies have left students bored and frustrated.

In the past, typing has been seen as a means of copying text - from typewritten, handwritten or dictated originals, or from shorthand. Increasingly, typing is being done by people who are creating original text: they are think-keying. Fluent typing becomes immeasurably more important in this context, because thoughts, especially pearls of wisdom, have a tendency to disappear if they are impeded in their expression. We must key them in as quickly as possible, or they will be lost, perhaps forever. We haven't got time to hunt and peck. Our fingers must react to our thoughts and spell them out in the same way as the words dribble off the end of our pen: fluently.

It has been asserted (Austin & Pargman, 1981) that the most fluent performance is achieved by the person who is able to leave the execution of the skill to the unconscious self. The conscious self attends solely to the higher order activities associated with the skill being performed.

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Think ─────────────────▶ Key


Think ──────▶ Hunt
                &
              Peck ──────────▶ Key
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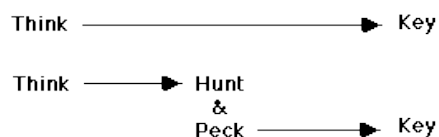
Following study leave in the United States some years ago, the author devised a keyboard teaching method using a roller chalkboard to encourage touch typing from the beginning. Students worked with sentences on the board instead of from a textbook at keyboard level. They were paced, because it is important they learn the elements of a skill at production speed and gain the kinaesthetic feedback which enables them to perform fluently. Students were reminded of the time when they learnt to ride a bicycle: if they went slowly they wobbled and fell off. A series of sentences were written on the board and the teacher turned them over the top after students had had time to key in each one. Students responded positively to this system which enabled the faster ones to move ahead while nudging along the slower ones. As educational technology developed, so did the program.

For several years, slides on the overhead projector replaced the roller board. A group of young children aged between 5 and 11 years learnt to type on electric typewriters during their school holidays. They gained a knowledge of the whole keyboard during five one-hour sessions. It was a

real thrill to see these youngsters literally running into the classroom to practise their new skill. Now at university, they report the benefits of being able to key in fluently. Think-keying was part of their introduction to the keyboard and they enjoyed swapping jokes they had written using only the letters they had learnt.

The introduction of electronic keyboards meant that the need for physical hand strength was removed and so word processing became a tool in the formation of language skills in primary schools.

The next stage of the program's development resulted from a perceived need for business people to be able to acquire a keyboarding skill quickly and perhaps even secretly (because of its un-macho image). Computers were becoming something of a management toy, but they were also being used seriously in firms with dispersed offices, such as Elders Pastoral. The production of *Key in for Information*, a pack of cards in a plastic wallet, coincided with more than 400 Elders Pastoral branches throughout Australia and New Zealand being linked by electronic mail. Allan Baird, their manager of office systems, was insistent that their staff should acquire efficient keyboarding skills so that they could use the electronic mail for all their inter-office communications and other work, such as preparation of wills for clients. Elders Pastoral prepared a house style training manual which accompanied *Key in for Information* into all their offices.

One reason for the choice of name for the keyboarding package was the excitement generated by on-line databases. So much information available at the end of a computer linkup! High on-line and connecttime costs mean there are considerable financial advantages to be gained from quick and accurate keyboarding.

The success of *Key in for Information* resulted in Pitman, one of the leading publishers in commercial education, suggesting some modifications which would result in an introductory keyboarding textbook. Because of the changed concept, it was with some reluctance that *The Pitman 10-hour Typing Program* was written.

At about the same time, my colleague, Dr Michael Gerrard, was wanting his students in Introduction to Computing to become competent in word processing. He computerised the sentences and produced the KEY software. The stimulus for the students learning to type now became characters on the computer screen (see following page).

In 1987 it was the first software encountered by 270 business students. During their first 75-minute workshop they covered, on average, six or seven units of the program. The first unit introduces the guide keys and subsequent units introduce one or two characters at a time. In their first workshop students are shown by the tutor how to start the program, select

lessons, and quit from the program. They are also given guidance regarding the height adjustment of their chairs, their posture, and the arrangement of their work materials. As reported by David McKinnon, we also found that students wanted to be set on the right track by a friendly human being and not just a user-friendly computer.

The KEY program is now used throughout the South Australian College of Advanced Education and in a number of other educational institutions throughout Australia.

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    Tab    Q    W    E    R    T    Y    U    I    O    P    [    ]

   Alt Crtl    A    S    D    F    G    H    J    K    L    ;    '    Return

     Caps Shift   Z    X    C    V    B    N    M    ,    .    /    Shift

                 ============== Space Bar ==============

 BASIC KEYBOARD SKILLS | MENU Press Return key to start the highlighted lesson

 USING THIS PROGRAM                    C key              U key
 Keyboard fingering                    P key              Q key
 Home Keys ASDFJL & GH                 3 & / keys         2 key
 E K . & Shift keys                    W key              I key
 N key                                 M key              6 & - keys
 CHECK YOUR POSTURE                    9 key              V & 4 keys
 X key                                 R & , keys         Y 7 5 keys
 T & ; keys                            7 key              SPEED TESTS
 8 1 & ' keys                          Z key              NUMERIC KEYPAD
 O (letter) and 0 (number)             B key              QUIT FROM PROGRAM

           Use arrow-keys to highlight your next lesson (or F1 for Help)
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Psychomotor Skills Background to the Development of KEY

The actual sequence of presentation of the letters of the keyboard can affect the long-term skill of the learner.

The most common typing error, with both beginners and experts, has been the confusion of E and I, for example 'thin' for 'then' and vice versa. This is directly attributable to the introduction of the keyboard, where the middle finger on each hand is involved in reaching up to the row above. As a remedial exercise, one can ask students to key in sentences involving the words 'left' and 'right' (E is keyed with the left hand and I with the right hand). Because 'prevention is better than cure', I have deliberately kept the introduction of these two letters far apart. E is the most common letter in the English language and, being a vowel, provides the maximum opportunity for students to increase their think-key capacity. Hence E is the first letter to be introduced after the guide keys (A S D F J K L;) and other keys on the 'home' row.

By learning the home keys first, a reference point is established from which students develop the kinaesthetic part of their keyboarding skill. A considerable part of a successful skilled performance is knowing the

correct feel of that performance. When introducing students to the keyboard it is, therefore, important to encourage them to actively memorise how the correct finger reaches feel. For this reason, I suggest that the students gain a photoimage of the finger-reach by watching their finger move to the new key, then internalise the feel of the movement as they make it several times. This can be done using a keyboard chart, if the student does not have access to a keyboard at the time they want to devote to keyboard practice. Research has shown that mental rehearsal is extremely effective in learning a psychomotor skill, so even the physical absence of a keyboard or chart is no excuse for not practising. Neural pathways can be reinforced by mentally keying in words and sentences (Cratty, Harby).
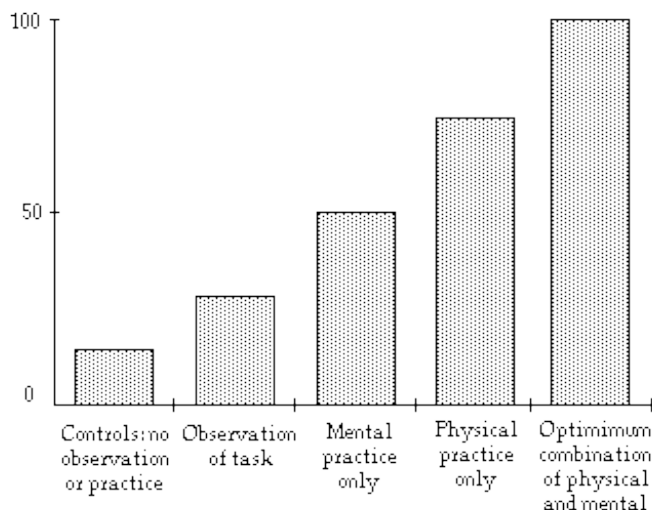
Effectiveness of different kinds of practice

Videotapes studied by Crudin suggest that a keystroke is represented in terms of the hand, finger and finger position that uniquely specifies it and that a common source of error is the incorrect assignment of one of these three components.

There are physical impediments to the keying of certain letter combinations. Double letters frequently present difficulty, as do letters on adjacent keys. There is a natural tendency to work towards a balance and this includes a preference for keying words which consist of letters keyed by alternate hands. Hence some words are likely to present more problems (and require more conscious practice) than others.

In the past, students were subjected to drills of meaningless letter combinations designed to enable them to respond speedily to the visual

stimuli from which they would work -- manuscript or corrected typescript, in the main. Grudin showed that typists frequently respond to the visual stimuli with digraphs, that is two-letter combinations are keyed almost as though they consisted of one character. So maybe it was useful to practise digraphs out of context.

I believe motivation plays a major role in the success of keyboarding and have seen the excitement of people who can key in a sentence in their very first lesson. That excitement was never present when I conformed to the textbook presentation.

Neil Fleming presented a landmark paper in 1979 when he was able to demonstrate the frequency with which various letter combinations occured in the English language. He questioned the purpose of asking students to drill letter combinations which never, or rarely, occur. By then I had been introducing the keyboard using sentences, as described above, for 15 years. If certain digraphs occur regularly in the English language, then the finger reaches will be automatically reinforced in the course of keying in normal English prose. Hence it is critically important to ensure that the introduction of the finger reaches establishes the correct neural pathways. Once these are established, the development of the skill, particularly in terms of the speed of execution, is dependent on frequency of use.

Denis Glencross, working at the Flinders University of South Australia, devised an introductory keyboarding program based on an information processing model and making use of multi-sensory input. He found that 'individuals in the workforce can be effectively trained at touch keying in short intensive training programs of some 10 hours' duration in total. Not only is a satisfactory speed of keying attained, but this is achieved with a high degree of accuracy'.

Proofreading

Students must be taught not to rely on their computer's spellcheck. Proofreading is a part of the keyboarding skill which students need to practise from the beginning of their keyboard learning. The computer will not tell them whether what they have keyed in makes sense, nor every time they have inverted letters as, for example,'form' instead of 'from'.

Pause Gymnastics

Relatively short, but frequent, practice sessions are usually more effective than long sessions. Beginners need to have a break from keying approximately every 10 minutes. Workers in South Australia and Germany are obliged to have a break from keying for 10 minutes in every hour. Ignoring this and 'pressing on' is frequently counter-productive .

Qantas advises its passengers to keep 'flighting fit' and has provided exercises to do on long flights. Experience in the classroom shows that such exercises are invaluable for people learning keyboarding.

STRETCH OUT

Simple Exercises to loosen you up...

NECK STRETCH: Sit with good posture. Draw your chin in so that your head glides back. Imagine your head is moving on horizontal rollers. Hold for a few seconds. When you relax, maintain good head position. If this is difficult, "fix" your right wrist on your breastbone, place the tip of your index finger gently on your chin, draw your chin back. After a few seconds allow your head to relax part way to your finger. Repeat three to six times.
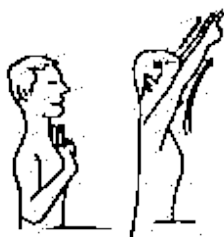
UPPER BACK STRETCH: Sit with good posture. Put your arms in a modified "surrender" position with your hands in front of your shoulders. Lightly clench your hands, but point strongly with your index fingers. Raise both arms to the highest comfortable position. Keep your elbows straight. Stretch both arms strongly to elongate them. Do not reach, uphold this position for several seconds, return to "surrender" position, check your posture and repeat the exercise three times.

Fingers: Grasp your left hand with your right thumb across the knuckles. Have all your right fingers supporting the full length of your left fingers. Use your right thumb for leverage as you press with your fingers to stretch the structures of the left hand. Maintain a firm stretch for about one minute. Repeat using the other hand.

SA Health Commission

Concentration on the screen means that people are not using their eye muscles to alter the focal length of their vision. This leads to tiredness, especially for beginners, who tend to concentrate so hard that they forget to blink and thereby lubricate the surface of their eyes.

Similarly beginners, and those who are deep in concentration, tend to hold their breath. By forgetting to breathe, they create a loss of oxygen to the brain and consequent proliferation of errors and feelings of discomfort. Qantas has provided breathing exercises, too.

Pause gymnastics can be performed at the workstation in the 'natural breaks' in the think-keying process or between tasks. At the time when journalists were starting to use visual display units instead of typewriters, Elwyn Evans, an ergonomist with the South Australian Health

Commission, devised *Stretch Out* - three exercises which he considered essential for people who spend any length of time keying in (See figure). I would suggest that for people like journalists who think-key, the exercises are even more important than for people transcribing from hard copy, even hard-to-read handwriting. This is because mental energy is being exerted in the creation of the text before it is translated into impulses down the arms and fingers.

In my experience there are other exercises which can enhance the wellbeing of anyone using a computer keyboard. Beginners often have difficulty in making their fingers work independently, so exercises to help this discrimination are important. A number of exercises are set out in *Keys to Speed and Accuracy.*

Physical well-being is an important factor in achieving one's aims in life.

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