Correlation Between Keyboard Spacing and Usability

Learning Ergonomics through the Keyboard (키보드로 알아보는 인간공학)
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Introduction

Purpose of the Study
The purpose of study, under the big topic of comparing each product, is to investigate keyboard usability depending on the difference in key spacing. The study was initiated to investigate the difference between key spacing and key layout with the hypothesis that each keyboard's design will have decisive influence on the user's typing ability.

Research Method
All experimenters proceeded with Task_1 and Task_2 on three different keyboards: Keyboard1, Keyboard2, Keyboard3. For Task_1, after writing a page of "My Love Hangul Day", in the long writing practice section from "Hankom Typing", the average hits/sec, accuracy, time and the number of times subjects glanced at the keyboard was measured. In Task_2 the subject viewed and rewrote the created Microsoft Word task which is a combination of Korean, English, and special characters. The time and number of incorrect figures were measured afterwards.

Apparatus
The experiment was conducted using three types of keyboards: the smallest being the foldable Britz BA-BK10 Bluetooth mini-keyboard as keyboard_1. Next the second in size Litecom COMS SS488 Bluetooth Keyboard was chosen as keyboard_2, and finally the biggest keyboard iMagic RF1430 was chosen as keyboard_3.

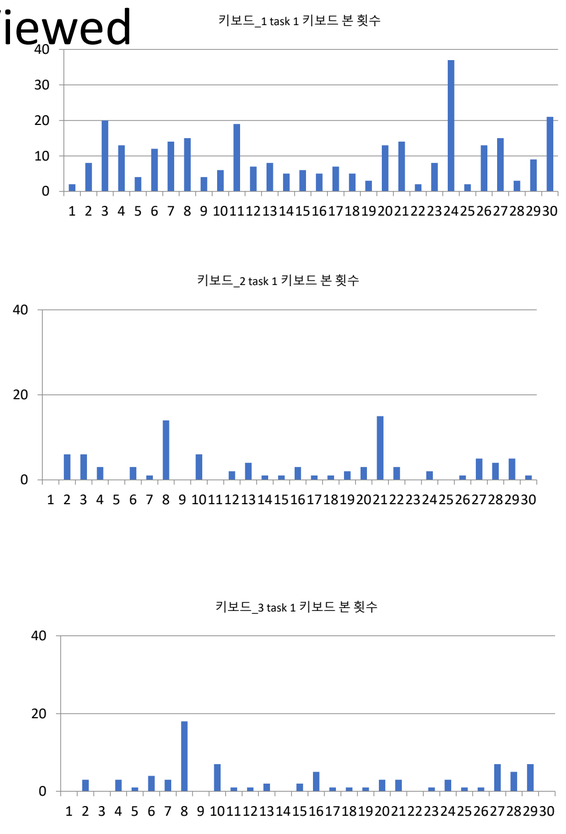
Experimental Procedure
S1_ After explanation on the experiment, fill out the agreement form
S2_ Random order of Keyboard_1, Keyboard_2, Keyboard_3 with each Task_1 and Task_2, and results taken
S_3 Results taken on Task_1 and Task2
S4_ Analysis on the results taken

Background
The study investigated the relationship between the keyboard size and user's gender, common environment, frequency of access to keyboards. Also, the study investigated how much the keyboard size and shape affected usability. By using Hangul and computer typing practice, the experiment showed how much quality the user exerts depending on the keyboard size. The study also investigated how the user could cope with a variety of changes on a keyboard through the process of typing randomly created sentences.

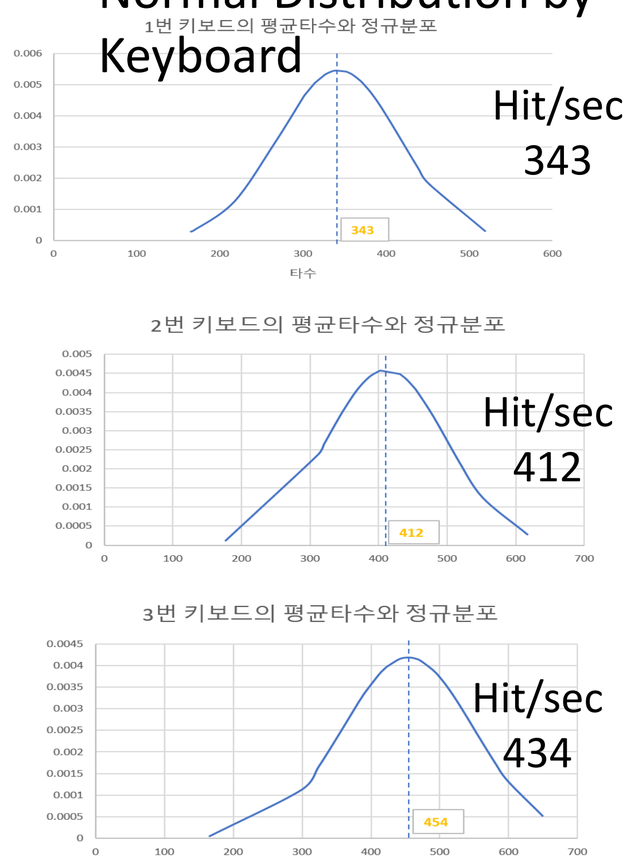
Research Participants
As for experimenters, 30 students from Handong University were gathered. 7 people, familiar with use of special characters, were gathered from the School of GE and ICT, and Computer Sciences.

Results

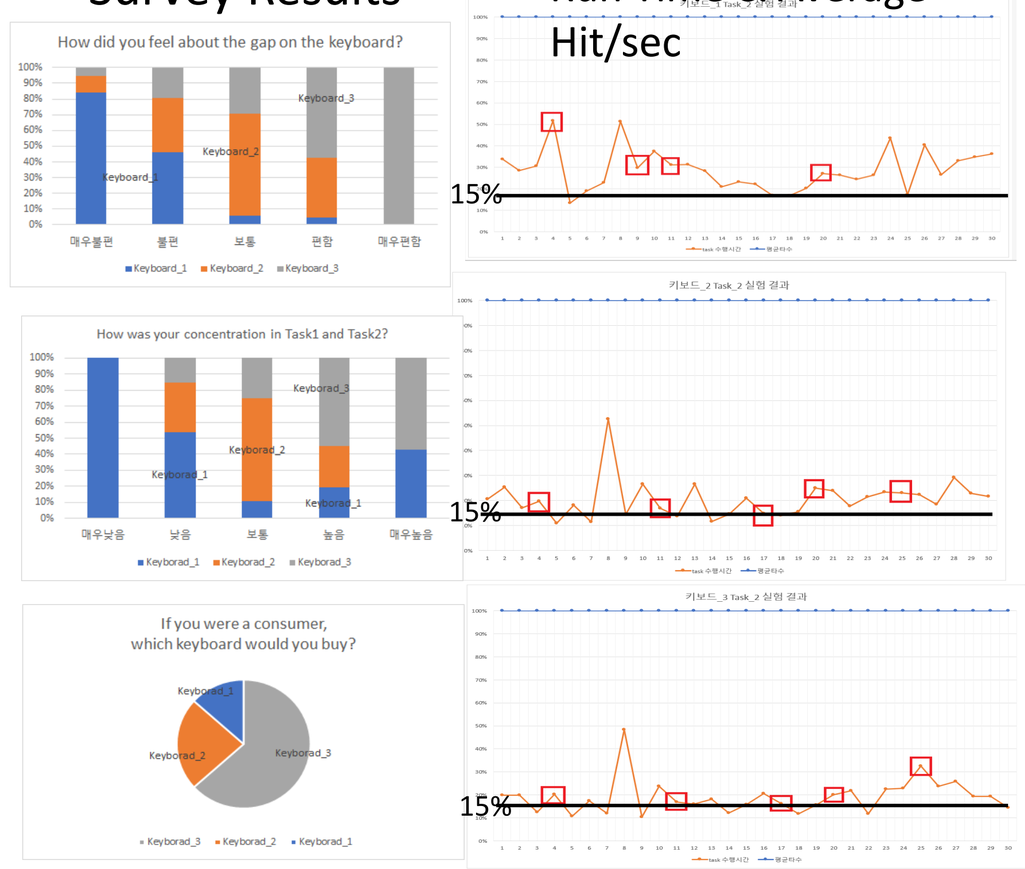
Times Keyboard was Viewed



Normal Distribution by Keyboard



Survey Results



Run Time & Average Hit/sec

- The experimenter's survey and the fact that the experimenter looks at the keyboard when feeling uncomfortable showed that Keyboard_3 on average was the most comfortable, which suggested that the wider the key spacing, the more comfortable the user felt.
- The average and standard deviation were obtained by sorting the average key hit/sec of each user that used all 3 keyboards. The 1st 2nd 3rd average key hit/sec turned out as the follows: the 1st average key hit/sec as the smallest to the 3rd average key hit/sec as the biggest.
- Through the analysis, we confirmed that more than half of the students consisting of more than half of the students from School of GE and ICT and Computer Sciences (no.4,5,9,11,17,20,25) classified separately, showed high task performance. This is consistent with the previous hypothesis which claimed that "the group that used many special characters will have high performance abilities on Task_2", and more that half of the students from the 7 experimental groups out of the total 30 people showed high performance abilities.
- On key spacing, the greater the key spacing the more comfort the experimenters felt. On concentration levels as well generally the as keyboard size became bigger high concentration rates were shown, but people who quickly adapted to different keyboard sizes showed similar concentration rates to differing keyboard sizes. On questions concerning interest on keyboard purchase, purchase rates for keyboard_3 was the highest.

Discussion

- A keyboard having both portability (advantage of the small keyboard) and comfortability (advantage of the big keyboard), but being able to be folded, will prove to be effective.
- In most cases, the hypothesis that "the greater the key spacing the faster the typing speed" was correct, but some people from the 30 experimenters showed unexpected results inconsistent with the hypothesis. This means that if more samples are gathered, the hypothesis can be generalized by measuring reliability of the hypothesis.
- There were people who ignored errors and those who improved the errors from the experimenters. This should have been controlled in advance of the experiment.
- After the test, it was late to speculate that measuring the hand size before the experiment and deriving the resulting value would have been more useful.