

Analysis of Text Entry Performance Metrics of SwiftKey Keyboard Using WebTEM

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1 CURRENT RESEARCH PROJECT

Many researchers, throughout the years, suggested various text entry methods to assist the users to type faster and precisely. However, results obtained from these methods are vague and significantly diverse from one another and it is difficult to extract proper meanings from the values of entry speed and error rate. WebTEM, developed by Dr. Ahmed Sabbir Arif who is an assistant professor of Electrical Engineering and Computer Science at the University of California, is a web application to record text entry metrics. This application allows the researchers to get proper values and make sense out of it. SwiftKey keyboard, an application available for android device, provides multiple keyboard layouts. WebTEM application is proper platform to analyze error and entry rate of users who have used these layouts.

2 EXPERIMENTAL DESIGN

Our objective of the experiment is to determine if we are able to detect measurable differences in dependent variables between levels of the independent variables.

2.1 Setup

The experiment was set up in a way so that it falls under within-subject design where each participant was exposed to multiple conditions. The keyboard layouts are:

- Default keyboard layout.
- High contrast keyboard layout.
- Light keyboard layout.

Multiple conditions along with the layout includes:

- Mobility (Seated/Walking).
- Device (Laptop/Tablet/Mobile).
- Setting (Outdoor/indoor).
- Location (Home/School).
- Handedness (Left/Right/Ambidextrous).

Here, our independent variables (inputs, they are what we manipulate) are the keyboard layouts and all other conditions imposed on the participants. Dependent variables (outputs, they are what we measure) are total error rate and entry rate (word per minute).

2.2 Participants

All the participants were students; either university or college student. Both male and female participated as part of the experiment. They were randomly selected and no particular groups were formed. All of them were ambidextrous and their ages fall in between 18 to 25 years. Frequently-used parameters, or combinations of parameters, include:

2.3 Procedure

Each participant was enlightened about the survey that they were going to take and getting the verbal agreement from them the survey starts by filling out the necessary information. All the survey is done within the indoor compound of either a university or a home. Each participant had to type 30 sentences where each session contained a phrase set of randomly generated 5 sentences provided in English language. There were certain order keyboard layout and mobility which are:

- Default seated (5 sentences)
- High contrast seated (5 sentences)
- Light seated (5 sentences)
- Default walking (5 sentences)
- High contrast walking (5 sentences)
- Light walking (5 sentences)

3 RESULT

Before we began our experiment, we have initiated a null hypothesis and an alternate hypothesis for total error rate and we did the same for WPM. Using the values found in WPM and Total Error Rate column we have been able to find the mean and standard deviation and plot histogram.

Mobility	Layout	Mean (ER)	SD (ER)	Mean (WPM)	SD (WPM)
Seated	Default	9.465	14.383	26.657	9.345
Seated	High-Contrast	6.546	6.214	28.960	7.346
Seated	Light	7.495	8.012	30.069	10.376
Walking	Default	10.353	14.418	29.941	8.635
Walking	High-Contrast	8.622	9.884	30.180	7.622
Walking	Light	7.642	7.521	30.041	7.718

Table 1: Mean and SD of ER and WPM under different settings

Our findings are:

- Less error exists for a person who is typing while seated using any keyboard layout rather than people walking and typing using the same layout.
- Typing speed is equal or less while seated using any keyboard layout rather than people walking and typing using the same layout.
- The light keyboard layout is a reliable layout as it produced less error and was comparably faster.