Learn New Words and Spelling with Autocorrections

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Goal
Investigate whether learning new words and spelling occurs with autocorrection augmented with the standard feedback method, and whether a novel color-code feedback method that informs children of how an incorrect input was fixed increases learning.

Custom Application
The custom application displayed drawings of people, animals, and objects on the screen, and asked children to enter the name of the entity in the picture using Google keyboard. When children could not recognize the subject of a picture, they could tap on it to hear its name. It used a custom autocorrection method and implemented the color-coded feedback using the Levenshtein distance algorithm.

The between-subjects design was:
2 groups (basic/standard (a) and color-coded (b)) ×
13 children (7-8 year-olds, average age 7.5) ×
3 sessions (with a day in between) ×
25 pictures/nouns = 1,950 words in total

Metrics
Words per Minute (WPM) is the number of words produced in a minute.

Success rate (SR) is the rate (%) at which correctly spelled words were inputted.

\[ SR = \frac{\text{Number of correctly spelled words}}{\text{Number of words entered}} \times 100\% \]

Recall rate (RR) is the proportion (%) of new words that were correctly recalled.

\[ RR = \frac{\text{Number of correctly recalled words}}{\text{Number of words entered}} \times 100\% \]

Subjective Analysis
After the last session, children were asked to fill out a questionnaire, where they could rate the feedback methods on a 5-point Smileyometer scale.

User feedback was positive for both feedback methods. Most children
• liked basic (92%) and color-coded (85%),
• felt that basic (100%) and color-coded (92%) helped them to learn new words and spelling,
• wanted to keep using basic (100%) and color-coded (92%).

Results
Color-coded yielded significantly better recall rate. A significant effect of session was identified for both feedback methods.

The data correlates well to the power law of practice for both feedback methods.

No significant effect on entry speed. No significant effect of session.

Results suggested that the color-coded method significantly improves learning new words. Interestingly, learning was also observed with the conventional method, demanding further investigation into if predictive methods are truly a barrier to learning new words and spelling.