

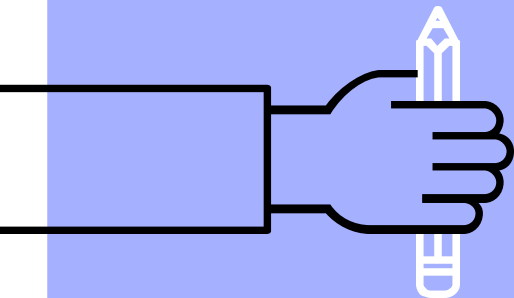
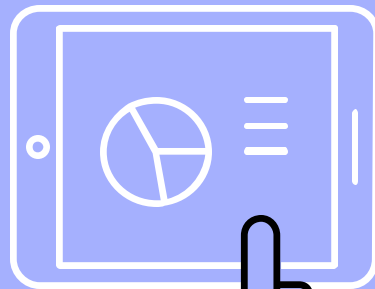
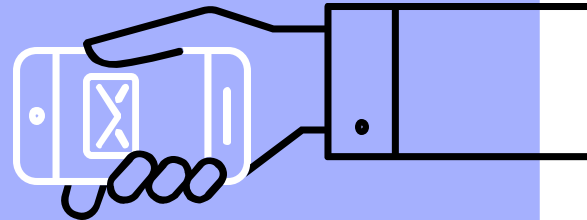


UNIVERSITY OF TORONTO
OISE | ONTARIO INSTITUTE
FOR STUDIES IN EDUCATION

Voice Recognition: Using One's Voice to Write

Emily Staffiere

Academic Intervention Lab
OISE

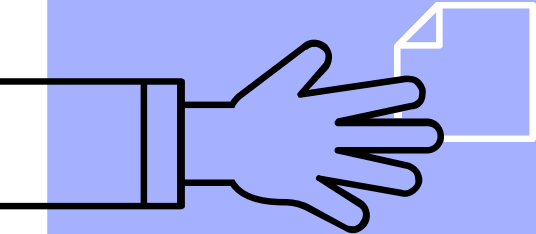
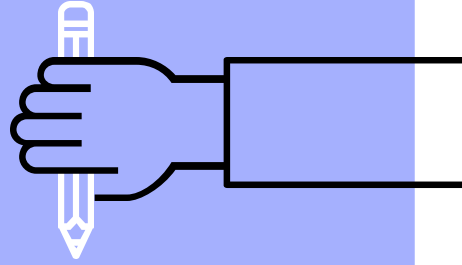


So many products...

- ▶ For every AT tool there are several different products
- ▶ Rigorous product evaluations would help narrow down appropriate selections for each student
 - Currently, research in this area is lacking and biased



What is Voice Recognition software?



An AT that can:

- ▶ Recognize and translate spoken language into written text
- ▶ Speech-to-text
- ▶ Enable the user to:
 - Talk naturally to the computer, which will record exactly what they said as text
 - Speak commands enabling hands-free computing



Voice Recognition (VR)



Voice Recognition Mini-Study (November 2019)

Passage

Rainbow
passage

Standardized:
Mic distance,
reading pace,
audio files



Voice Recognition Softwares

MS Word, MS
Cortana,
Google Docs,
Mac iOS,
Dragon 15



Error Types

1. Omission
2. Addition
3. Substitution
4. Grammar ("pass" vs. "passed")
5. Homophone ("two" vs. "to")
6. Punctuation
7. Capitalization

Voice Recognition Mini-Study (November 2019)

Passage

Rainbow
passage

$N = 10$ (5 male)

Counterbalanced
order; cleared
cache

When the sunlight strikes
raindrops in the air they act as a
prism and form a rainbow.

(Fairbanks, 1960)

- 4s delay
- Speak clearly
- Say the punctuation
- Audio file editing

Voice Recognition Mini-Study (November 2019)

Voice Recognition Softwares

- Microsoft Word
 - Microsoft Cortana
 - Google Docs
 - Mac iOS
- Server Side
-
- Dragon 15 → Client Side

Voice Recognition Mini-Study (November 2019)

Voice Recognition Softwares

Google Docs

1 When the sunlight strikes raindrops in the air, they act as a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow. Throughout the centuries people have explained the rainbow in various ways. Some have accepted it as a miracle without physical explanation. To the Hebrews it was a token that there would be no more universal floods. The Greeks used to imagine that it was a sign from the gods to foretell war or heavy rain. The Norsemen considered the rainbow as a bridge over which the gods passed from earth to their home in the sky. Others have tried to explain the phenomenon physically. Aristotle thought that the rainbow was caused by reflection of the sun's rays by the rain. Since then physicists have found that it is not reflection, but refraction by the raindrops which causes the rainbows. Many complicated ideas about the rainbow have been formed. The difference in the rainbow depends considerably upon the size of the drops, and the width of the colored band increases as the size of the drops increases. The actual primary rainbow observed is said to be the effect of superimposition of a number of bows. If the red of the second bow falls upon the green of the first, the result is to give a bow with an abnormally wide yellow band, since red and green light when mixed form yellow. This is a very common type of bow, one showing mainly red and yellow, with little or no green or blue.

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Voice Recognition Mini-Study (November 2019)

Voice Recognition Softwares

Dragon 15

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Voice Recognition Mini-Study (November 2019)

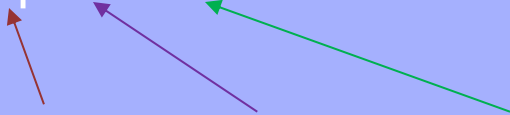
Error Types

1. Omission
2. Addition
3. Substitution
4. Grammar ("pass" vs. "passed")
5. Homophone ("two" vs. "to")
6. Punctuation
7. Capitalization

Examples:

"rain. Since..."

"rain period since"


Addition + Substitution + Capitalization

- 3 independent raters
- Scoring criteria
- Inter-rater reliability $\geq .94$

Voice Recognition Mini-Study (November 2019)

1 Sunlight strikes raindrops in the air, the act is a prison in former rainbow. The rainbow is division of white light to many beautiful colours. Please take the shape of a long round arch, but it's passed by above, and its 2 ends apparently beyond the horizon. There is, according to legend, boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he's

looking for the pot of gold at the end of the rainbow. Throughout the centuries people have explained the rainbow in various ways. Some have accepted it as a miracle

with her

physical explanation. To the Hebrews it was a token that there would be no more universal floods. The Greeks used to imagine that

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considered the rainbow as a bridge over which the gods pass

from earth to their home in the Sky.

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Rays by the rain period since then businesses have found that

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yellow period this is a very common type of bow comma

one showing mainly red and yellow comma with little or no green or

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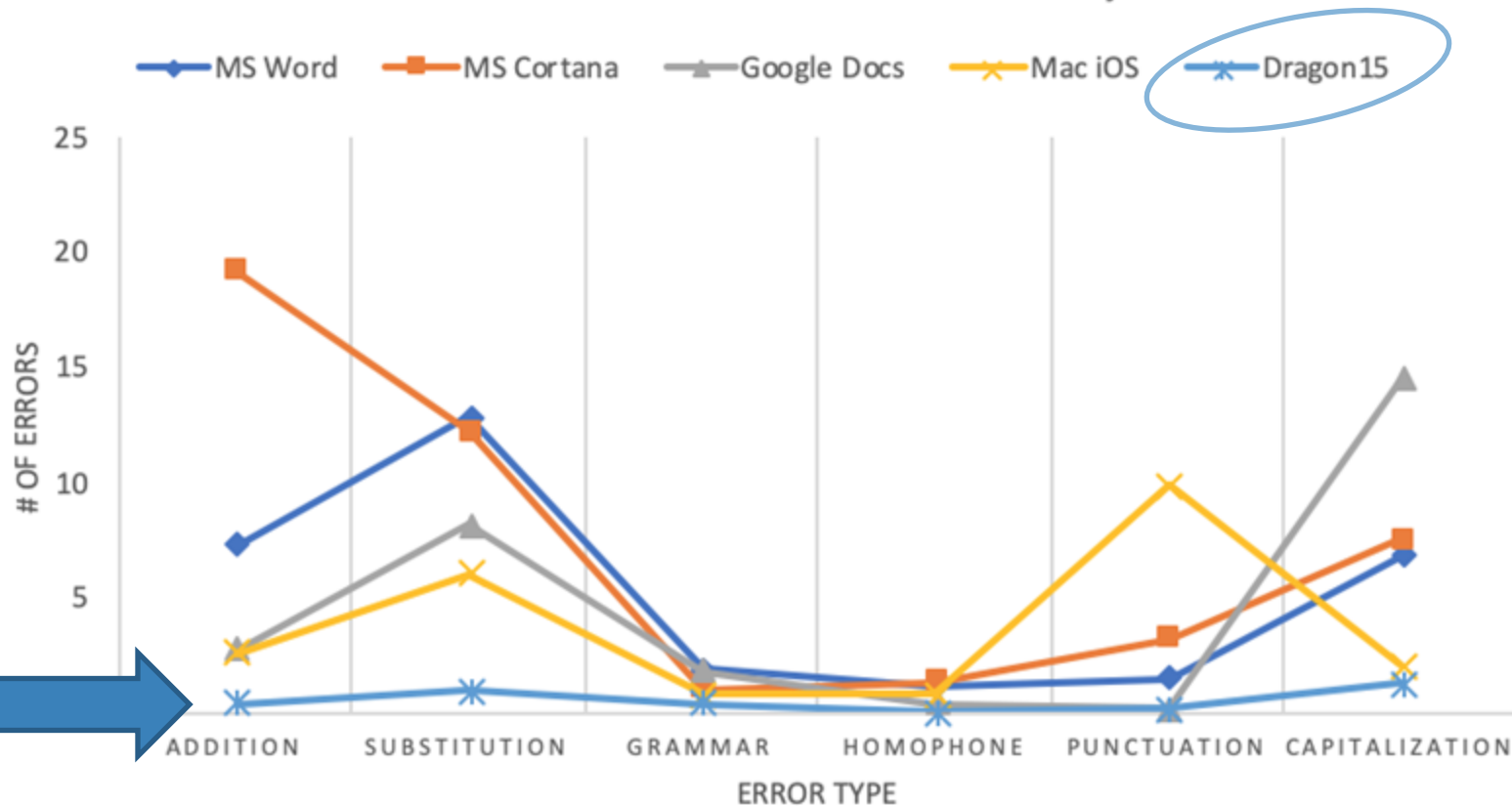
reading green light when mixed form yellow period this

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with little or no

➤ Within – participant variation

ERRORS MADE BY EACH PROGRAM, BY TYPE



Vocabulary Systems

Open

- Internet based (i.e. MS Word, Cortana, Google Docs, Mac)
- Different languages
- Continuous population of new words

Example:

“acasa” vs. “act as a”

→ 1 Spelling + 1 Omission

Closed

- Limited vocabulary
- Trained to each voice
- Dragon: 80,000 words to search from

Taming the Dragon - v15

- ▶ Various Dragon products suited for different productivity needs
- ▶ Allows users to “train” program to recognize their voice, word pronunciation, and speech patterns



Classroom Considerations



Product Evaluations

	Calculators	Annotation	Audiobooks	OCR
<u>Functionality</u>	Accurate Calculations	Add Annotations Highlight Text	Read books aloud using human voices vs. computer-generated voices	Accurately extracts text into editable files
<u>Features</u> [document sharing; linked commenting; cloud-based storage]	Lines of Display Button Colours Battery Type Error Messages	Margins Document Signing Word Limit Voice Note Multimedia Insert OCR	Visual Text Bimodal Reading Speed Control Voice Options Multilingualism Playback Flexibility Bookmarking Sync Across Devices	Formatting Consistency Text Accuracy Language Packages Text-Editor Compare Document Text-to-Speech
<u>Ease of Use</u>	Accuracy Completion Time	Start up Time # of Clicks	Start up Time # of Clicks	Conversion Speed # of Clicks
<u>Subjective User Experience</u>	Qualitative Preferences	Qualitative Preferences	Qualitative Preferences	Qualitative Preferences

Thank you for your time!

Emily Staffiere, BSc.

emily.staffiere@mail.utoronto.ca



@atselect_oise



@atselect_oise



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