

# LaMPost

## Design and Evaluation of an AI-assisted Email Writing Prototype for Adults with Dyslexia

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# What is dyslexia?

Dyslexia refers to a cluster of symptoms that can result in difficulties with **word recognition, reading fluency, spelling, and writing**.<sup>1,2</sup>

Adults may find compensatory strategies for **reading difficulties**.<sup>3,4,5</sup>

- e.g., TTS tools, adjusting text presentation

However, they can face ongoing **issues with writing tasks**.<sup>4,6</sup>

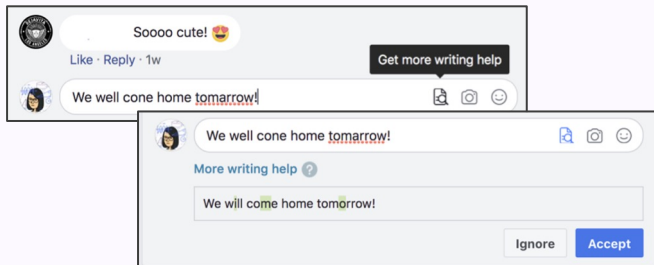
- Requires a combination of reading + several other skills.

1. International Dyslexia Assn.
2. Shaywitz et al. (1992)
3. Moojen et al. (2020)
4. Mortimore & Crozier (2006)
5. Pederson et al. (2016)
6. Reynolds & Wu (2018)

# Related Work

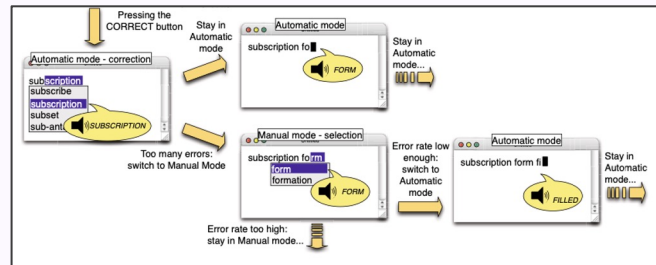
Writing support for dyslexia has primarily focused on **lower-level** interventions:

## Specialized spellcheckers<sup>1</sup>



Wu et al., 2019

## Word retrieval tools<sup>2</sup>



Quattrini et al., 2013

Support for **higher-level** aspects of writing (sentences and paragraphs) is **mostly absent** from the literature.

1. e.g., Pedler (2007); Rello et al. (2015); Wu et al. (2019)
2. e.g., Morris et al. (2018); Quattrini et al. (2013); Rauschenberger et al. (2019)

## Background

# Large Language Models (LLMs)

LLMs present an opportunity to bridge this gap.

- Capable of natural language generation.
- Steerable; completes specific tasks via few-shot learning.

## Background

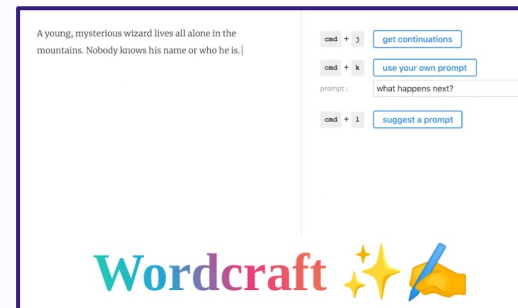
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- Steerable; completes specific tasks via few-shot learning.

Yuan *et al.*'s **Wordcraft** demonstrated the potential for LLMs as writing support tools.

Yuan et al. (2022)



*An LLM-powered platform  
to assist with ideation in  
creative writing.*

## Background

# Large Language Models (LLMs)

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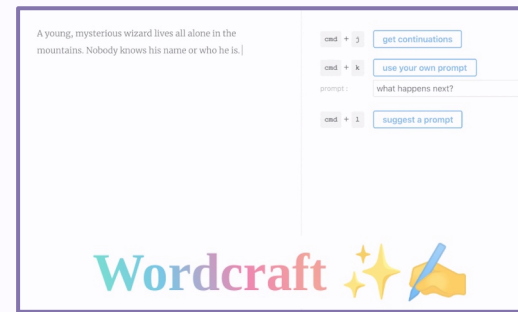
- Capable of natural language generation.
- Steerable; completes specific tasks via few-shot learning.

Yuan *et al.*'s **Wordcraft** demonstrated the potential for LLMs as writing support tools.

**New questions arise with LLMs for dyslexia;** e.g.,

While generative features could help an individual with dyslexia to overcome their **“fear of the blank page”**<sup>1</sup>, how does this addition impact their **sense of autonomy?**<sup>2</sup>

Yuan et al. (2022)



*An LLM-powered platform  
to assist with ideation in  
creative writing.*

1. Price (2006)

2. Gero & Chilton (2019)

## Objective

# Exploring LLMs for writers with dyslexia

Our work was motivated by the following research questions:

1. How can LLMs be applied to **enhance the writing workflows** of adults with dyslexia?
2. How do adults with dyslexia **feel about LLM-assisted writing**?

## Objective

# Exploring LLMs for writers with dyslexia

Our work was motivated by the following research questions:

1. How can LLMs be applied to enhance the writing workflows of adults with dyslexia?
2. How do adults with dyslexia feel about LLM-assisted writing?

To begin, we built **LaMPost**, an LLM-enabled prototype for writing emails.

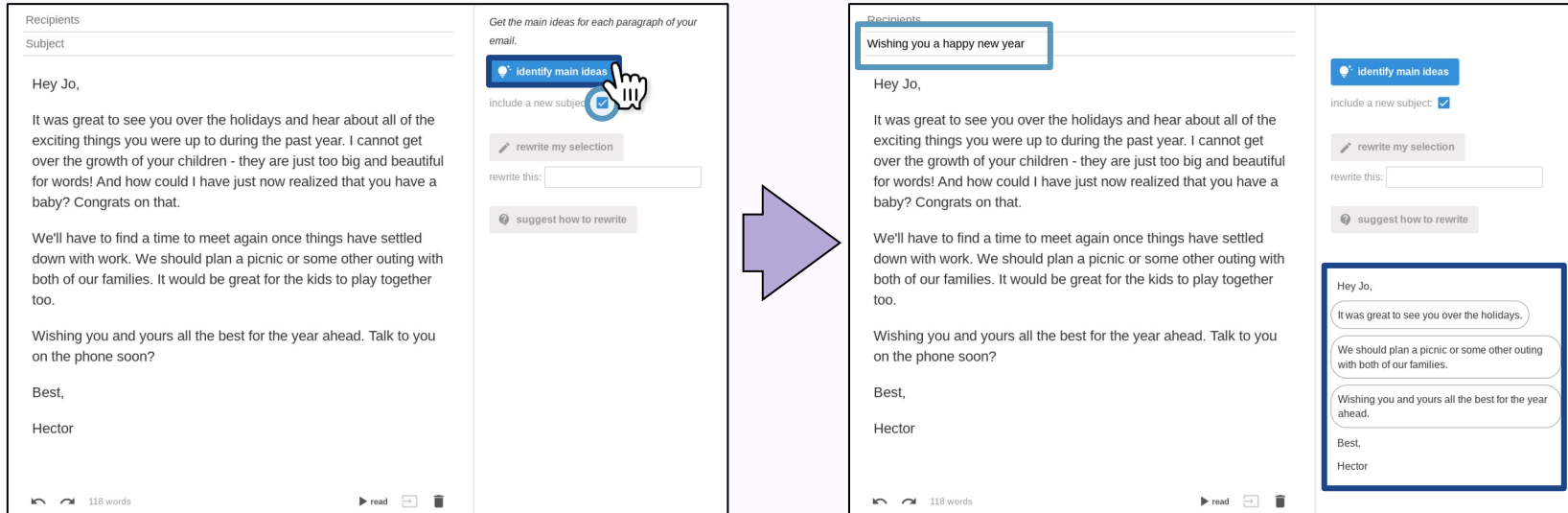
- Each of LaMPost's features targeted a different set of writing challenges expressed by writers with dyslexia.



# Identify Main Ideas

**Motivation:** Supporting overall clarity and organization of high-level ideas.

Generates a **visual outline** with main ideas from each paragraph; adds an optional **subject line**



The image displays two side-by-side screenshots of the LaMPost interface, illustrating the 'Identify Main Ideas' feature. A large purple arrow points from the left screenshot to the right one.

**Left Screenshot (Before):**

- Recipients:** [Empty field]
- Subject:** [Empty field]
- Text:** Hey Jo,  
It was great to see you over the holidays and hear about all of the exciting things you were up to during the past year. I cannot get over the growth of your children - they are just too big and beautiful for words! And how could I have just now realized that you have a baby? Congrats on that.  
We'll have to find a time to meet again once things have settled down with work. We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.  
Wishing you and yours all the best for the year ahead. Talk to you on the phone soon?  
Best,  
Hector
- Right Panel:** "Get the main ideas for each paragraph of your email." A blue button labeled "identify main ideas" is highlighted with a hand cursor. Below it are options for "include a new subject" (checked), "rewrite my selection", "rewrite this:" (input field), and "suggest how to rewrite".

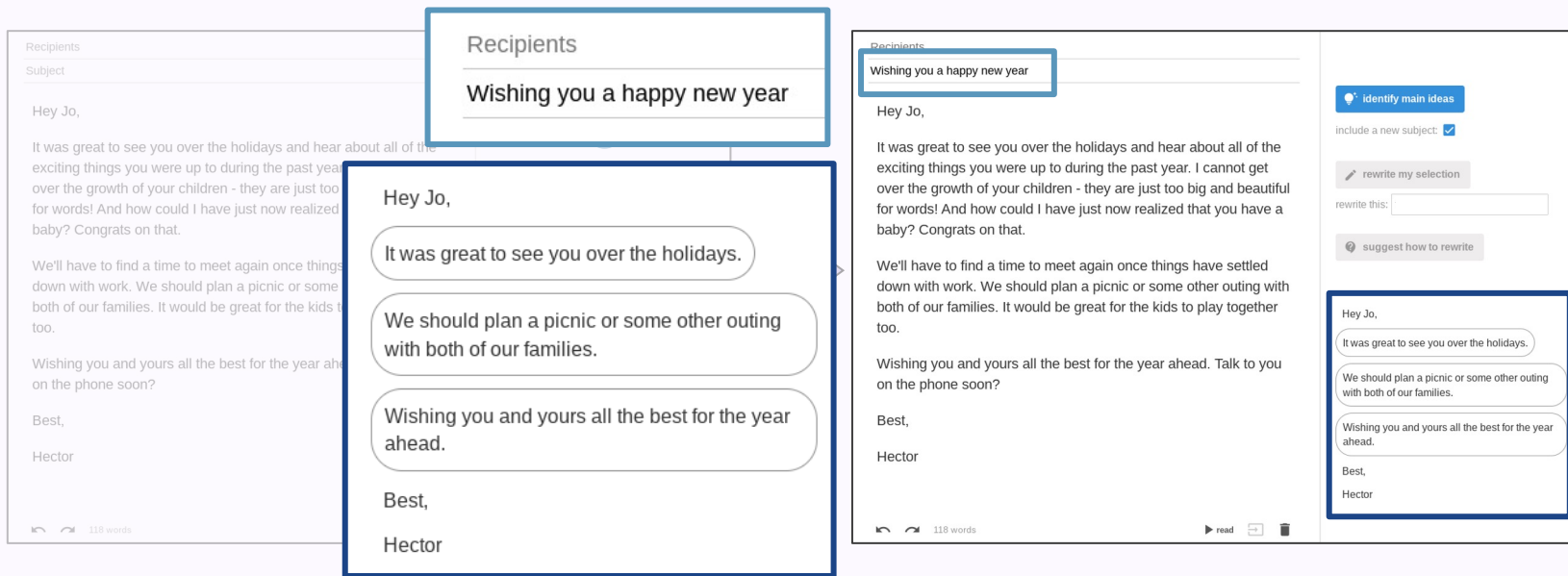
**Right Screenshot (After):**

- Recipients:** [Empty field]
- Subject:** "Wishing you a happy new year" (highlighted with a blue box)
- Text:** Hey Jo,  
It was great to see you over the holidays and hear about all of the exciting things you were up to during the past year. I cannot get over the growth of your children - they are just too big and beautiful for words! And how could I have just now realized that you have a baby? Congrats on that.  
We'll have to find a time to meet again once things have settled down with work. We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.  
Wishing you and yours all the best for the year ahead. Talk to you on the phone soon?  
Best,  
Hector
- Right Panel:** "identify main ideas" button is present. "include a new subject" is checked. Below the text, a blue-bordered box contains a visual outline of the main ideas from each paragraph:
  - Hey Jo,
  - It was great to see you over the holidays.
  - We should plan a picnic or some other outing with both of our families.
  - Wishing you and yours all the best for the year ahead.
  - Best,
  - Hector

# Identify Main Ideas

**Motivation:** Supporting overall clarity and organization of high-level ideas.

Generates a **visual outline** with main ideas from each paragraph; adds an optional **subject line**



The screenshot illustrates the 'Identify Main Ideas' feature in the LaMPost system. It shows an email draft on the left, a central 'visual outline' box, and a right-hand control panel.

**Left Panel (Email Draft):**

Recipients  
Subject

Hey Jo,

It was great to see you over the holidays and hear about all of the exciting things you were up to during the past year. I cannot get over the growth of your children - they are just too big and beautiful for words! And how could I have just now realized that you have a baby? Congrats on that.

We'll have to find a time to meet again once things have settled down with work. We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.

Wishing you and yours all the best for the year ahead. Talk to you on the phone soon?

Best,  
Hector

118 words

**Central Panel (Visual Outline):**

Recipients  
Wishing you a happy new year

Hey Jo,

It was great to see you over the holidays.

We should plan a picnic or some other outing with both of our families.

Wishing you and yours all the best for the year ahead.

Best,  
Hector

**Right Panel (Control Panel):**

identify main ideas

include a new subject:

rewrite my selection

rewrite this:

suggest how to rewrite

Hey Jo,

It was great to see you over the holidays.

We should plan a picnic or some other outing with both of our families.

Wishing you and yours all the best for the year ahead.

Best,  
Hector

118 words

read

# Suggest Possible Changes ?

**Motivation:** Identifying high-level adjustments to improve the writing.

*Generates **suggestions** for a selected passage; can be combined with the Rewrite feature.*

The diagram illustrates the 'Suggest Possible Changes' feature in two stages:

**Left Panel (Initial State):** A user is editing an email. A portion of the text is selected. The interface shows a sidebar with options: 'Identify main ideas', 'include a new subject: ', 'rewrite my selection', and 'suggest how to rewrite'. A hand cursor is clicking on 'suggest how to rewrite'.

**Right Panel (Action State):** The same email is shown, but the 'suggest how to rewrite' modal is open. It displays a list of suggestions: 'Rewrite this sentence to be more formal', 'Rewrite this sentence to be less formal', 'Rewrite this sentence to be more personal', 'Rewrite this sentence to be less casual', 'Rewrite this sentence to be clearer and shorter', 'Rewrite this sentence to be less business like', 'Rewrite this sentence to be clearer about what was discussed over the holidays', and 'Rewrite this sentence to sound more familiar'. The first option is selected, and a modal for choosing an option is visible at the top right with buttons for 'choose enter', 'cancel esc', and 'refresh tab'.

# Suggest Possible Changes ?

**Motivation:** Identifying high-level adjustments to improve the writing.

*Generates **suggestions** for a selected passage; can be combined with the Rewrite feature.*

The image displays two side-by-side screenshots of the LaMPost interface, illustrating the 'Suggest Possible Changes' feature. Both screenshots show a text editor with a highlighted sentence: "It was great to see you over the holidays and hear about all of the exciting things you were up to during the past year. I cannot get over the growth of your children - they are just too big and beautiful for words! And how could I have just now realized that you have a baby? Congrats on that."

**Left Screenshot:** The interface shows a list of suggestions for the highlighted sentence:

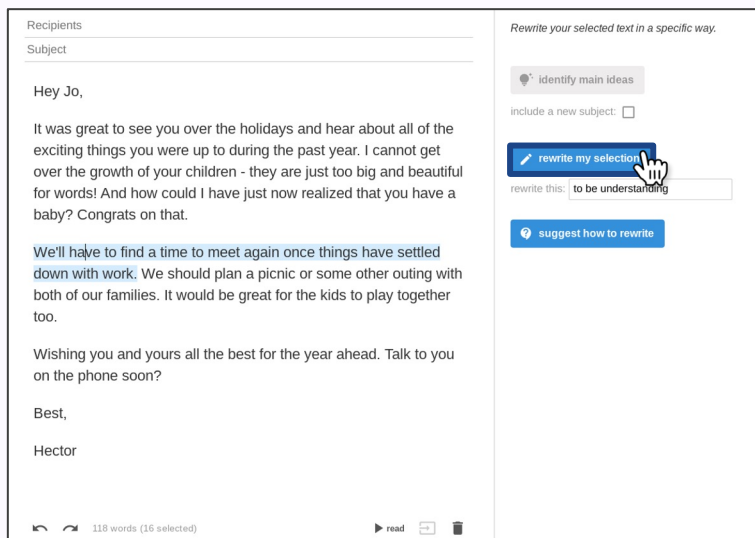
- Rewrite this sentence to be more formal
- Rewrite this sentence to be less formal
- Rewrite this sentence to be more personal
- Rewrite this sentence to be less casual
- Rewrite this sentence to be clearer and shorter
- Rewrite this sentence to be less business like
- Rewrite this sentence to be clearer about what was discussed over the holidays
- Rewrite this sentence to sound more familiar

**Right Screenshot:** The interface shows the same list of suggestions, but with a "choose" button highlighted in blue. The "choose" button is located at the top right of the suggestions menu. The "refresh" button is also visible. The "choose" button is highlighted in blue, indicating it is the selected option.

# Rewrite My Selection

**Motivation:** Expressing ideas with a desired phrasing, tone, or style.

*Generates **rewritten alternatives** to a selected passage based on a **custom instruction**.*



Recipients  
Subject

Hey Jo,

It was great to see you over the holidays and hear about all of the exciting things you were up to during the past year. I cannot get over the growth of your children - they are just too big and beautiful for words! And how could I have just now realized that you have a baby? Congrats on that.

We'll have to find a time to meet again once things have settled down with work. We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.

Wishing you and yours all the best for the year ahead. Talk to you on the phone soon?

Best,

Hector

118 words (16 selected)

Rewrite your selected text in a specific way.

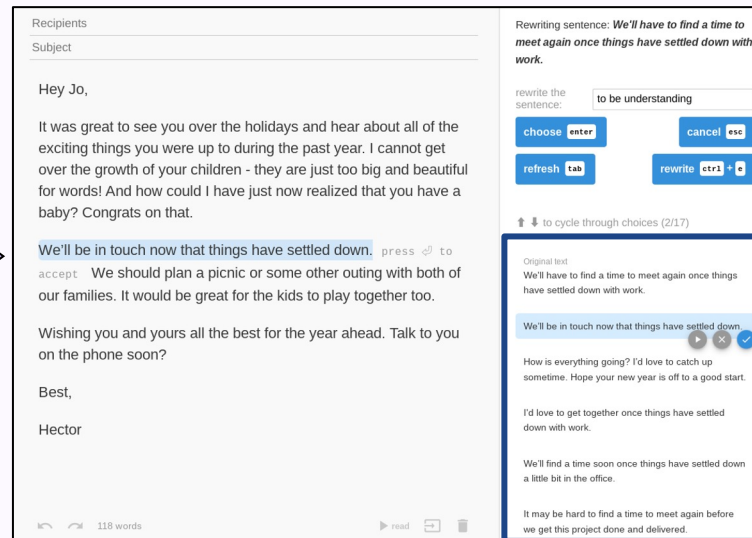
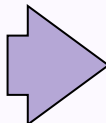
Identify main ideas

include a new subject:

rewrite my selection

rewrite this: to be understanding

suggest how to rewrite



Recipients  
Subject

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We'll be in touch now that things have settled down. We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.

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118 words

Rewriting sentence: *We'll have to find a time to meet again once things have settled down with work.*

rewrite the sentence: to be understanding

choose enter

cancel esc

refresh tab

rewrite ctrl + e

↑ ↓ to cycle through choices (2/17)

Original text  
We'll have to find a time to meet again once things have settled down with work.

We'll be in touch now that things have settled down

How is everything going? I'd love to catch up sometime. Hope your new year is off to a good start.

I'd love to get together once things have settled down with work.

We'll find a time soon once things have settled down a little bit in the office.

It may be hard to find a time to meet again before we get this project done and delivered.

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We'll be in touch now that things have settled down. press ↵ to accept We should plan a picnic or some other outing with both of our families. It would be great for the kids to play together too.

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# User Study

We evaluated LaMPost with **19 participants with dyslexia**.



(remote sessions, 75 min)

**All participants wrote emails regularly**; most ( $n=14$ ) sent several each day.

- Based in United States (16) and Canada (3)
- Ages: 18-24 years (1), 25-34 years (7), 35-54 years (11)

# Rewrite My Selection

Rewrite was rated the **highest for usefulness** on average.<sup>1</sup>

(*avg.=5.26, SD=1.26*)

Nine said it was as the most useful feature.

**Primary benefit:** Finding satisfying wording for an intended idea.

→ **Custom instructions steer results** toward desired tone or language.

“You’re able to get a start on what you’re going to say and **you can tweak your writing** from there.”

*Participant 18*



1. 7-point agreement scale: “*This [feature] was useful to me when writing emails.*”



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**Primary benefit:** Finding satisfying wording for an intended idea.

→ **Custom instructions steer results** toward desired tone or language.

**Primary concern: “Hallucinations”**<sup>2</sup> (imaginary details) added to some rewritten results.

→ Some worried about catching errors due to their reading difficulties.

1. 7-point agreement scale: “*This [feature] was useful to me when writing emails.*”

2. Devlin et al. (2018); Radford et al. (2019)

“You’re able to get a start on what you’re going to say and **you can tweak your writing** from there.”

*Participant 18*



“It’s almost like a suggestion or an assistant telling me to go do that. That’s not necessary.”

*Participant 6, after “I’ve also posted on local Facebook” was added to their email*



# Identify Main Ideas

Main Ideas was rated **second for usefulness** on average.<sup>1</sup>

(*avg.=5.11, SD=1.82*)

Only four said it was as the most useful feature.

**Primary benefit:** Verify if writing delivers an intended message.

**Primary concern:** Not needed by most participants.

“It gives the ability to see, and **make an independent verification**, that I’m hitting the points that I want to hit.”

*Participant 4*



1. 7-point agreement scale: “*This [feature] was useful to me when writing emails.*”

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**Primary concern:** Not needed by most participants.

**Subject line:** Very positive response, including those that were uninterested in the visual outline.

→ **Compressing message to a single phrase** is a frequent challenge

1. 7-point agreement scale: “*This [feature] was useful to me when writing emails.*”

“It gives the ability to see, and **make an independent verification**, that I’m hitting the points that I want to hit.”

*Participant 4*



“I always leave the subject line blank. [...] Nothing fits.”

*Participant 19*



# Suggest Possible Changes

Suggest received **mixed ratings for its usefulness**.<sup>1</sup>

(*avg.=5.05, SD=2.03*).

Six said it was as the most useful; six said it was the least.

**Primary benefit:** Fixing a detected, but unclear issue.

**Primary concern:** Suggestions lacked explanation.

“[There are] times where I’m like,  
**‘Something doesn’t sound right.’**”

Participant 15



“It raises more questions than answers.”

Participant 16



1. 7-point agreement scale: “*This [feature] was useful to me when writing emails.*”

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**Primary benefit:** Fixing a detected, but unclear issue.

**Primary concern:** Suggestions lacked explanation.

**Secondary concern:** LLM **“hallucinates”** changes that are not relevant to the selected text.

→ E.g., *“fewer commas”* when none were present (P11).

This was unacceptable for most, although a few saw value.

1. 7-point agreement scale: *“This [feature] was useful to me when writing emails.”*

“[There are] times where I’m like,  
**‘Something doesn’t sound right.’**”

Participant 15



“It raises more questions than answers.”

Participant 16



“I’m going to think, **‘Why am I bothering to use [it]?’**”

Participant 10



“It sparks other ideas for how to rewrite things.”

Participant P5



## Inaccuracy and Noise

The primary concern raised by users were **inaccurate, unhelpful, or “nonsensical”** (P8, P11) results.

Most apparent in the **Rewrite** and **Suggest** features:

→ Open-ended LLM prompts that were very unpredictable

**Poses serious risks** for users that may not be able to assess these results.

Performance improvement and safeguards should be top priorities.

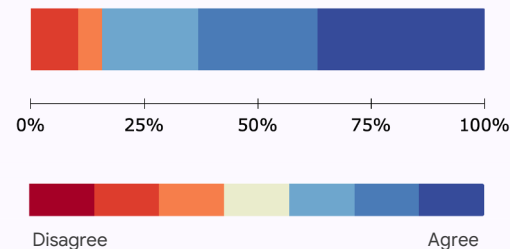
**Path forward:** Personalizing LLM prompts with a sample of the user’s writing for more familiar language.

# Choice and Autonomy

LaMPost's design **prioritized autonomy** by allowing users to choose the best option for their writing.

- Successful: most users felt in control while writing.
- Numerous options were helpful to filter through poor results.

*"I felt in control of my email's content when using the LaMPost system."*



However, participants said the selection process was **cognitively demanding and time-consuming**.

**Path forward:** Fewer, more diverse choices – with the option to generate more if needed.

# Summary

We evaluated **LaMPost—a prototype for LLM-powered writing support**—with 19 participants with dyslexia.

- Nearly all users identified at least one helpful feature; **Rewrite** and **subject line** were most popular.
- LLM performance is currently inadequate for practical use, but the positive response highlights their potential for the future.
- Users appreciated autonomy, and future work can explore balancing against cognitive load.



# LaMPost

## Design and Evaluation of an AI-assisted Email Writing Prototype for Adults with Dyslexia

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