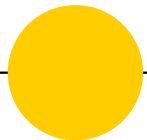# Beyond Grammar & Spelling

Supporting the Writing Process with Artificial Intelligence Tools

Victoria Eibinger & Ulla Fürstenberg

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What is Grammarly?

Digital writing tool

Beyond Grammar and Spelling

From grammar and spelling to style and tone, Grammarly helps you eliminate errors and find the perfect words to express yourself.

(Grammarly, 2021)

Grammarly's Claims

- Grammarly's vision: creating a "comprehensive communication assistant that promotes true understanding" (Hoover, 2019)
  - not just free of mistakes, but clear and compelling (e.g. spelling, grammar, punctuation, clarity, effectiveness)
  - contextual awareness (e.g. level of formality, audience, style, intent, and tone can be defined)
- Continual updates

Technology behind Grammarly

- First generation grammar checkers: pattern matching & string replacement (e.g. *isnt => isn't)*

- Second generation: real syntactic processing
  - rule-based descriptions of permissible syntax

- Grammarly: combines rules, patterns & artificial intelligence (AI) techniques
  - Leading AI-based grammar checker

(Dale, 2016; Grammarly, 2019)

Technology behind Grammarly

AI techniques: machine learning including **deep learning** & **natural language processing**

Deep learning: a method of machine learning that "teaches computers to do what comes naturally to humans: learn by example" (Mathworks, n.d.)

- ○ learning unsupervised from unstructured and unlabelled data (black box)

Wolf

Technology behind Grammarly
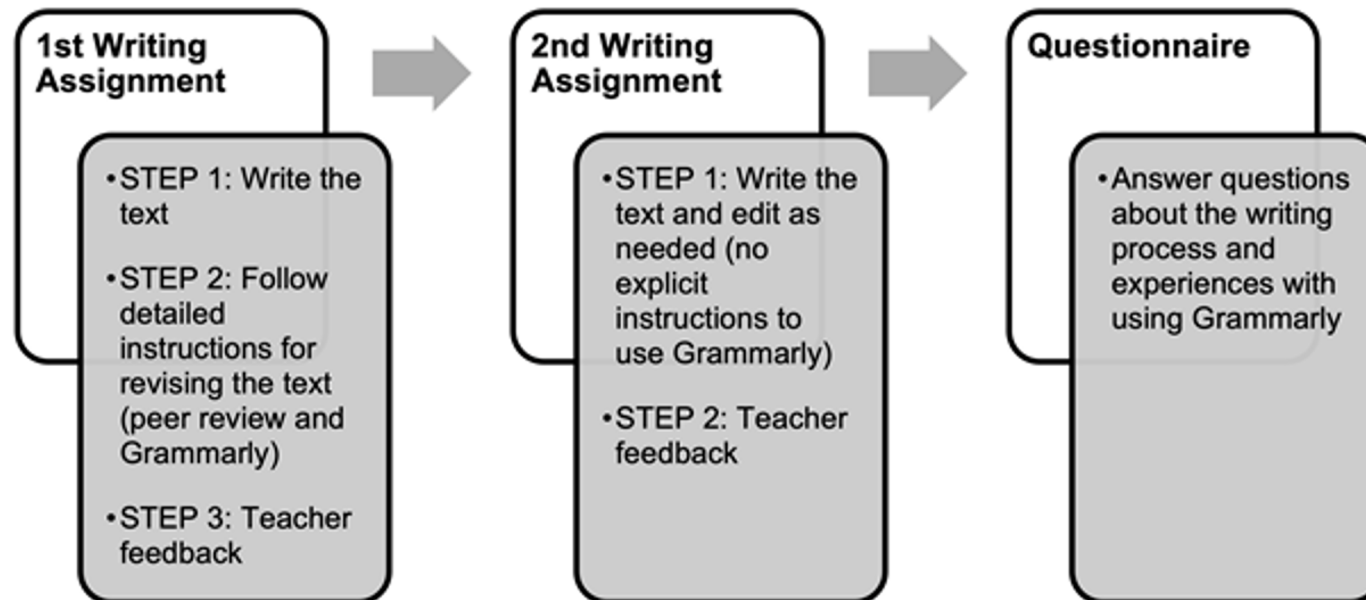
Natural language processing:

- science of extracting the meaning of written & spoken language

- requires common-sense knowledge of the world and recognizing hidden & implicit meanings

- problem for DL because more data is not necessarily a solution

(AI Perspectives, 2020)

Context

First year language course, process writing approach

1st Writing Assignment	2nd Writing Assignment	Questionnaire
•STEP 1: Write the text •STEP 2: Follow detailed instructions for revising the text (peer review and Grammarly) •STEP 3: Teacher feedback	•STEP 1: Write the text and edit as needed (no explicit instructions to use Grammarly) •STEP 2: Teacher feedback	•Answer questions about the writing process and experiences with using Grammarly

Motivation & Rationale

1. What are the main strengths and weaknesses of Grammarly from an English Language Teaching (ELT) perspective?

2. How can it be used efficiently and meaningfully within a process writing approach in an ELT context?

Instructions for Peer Reviewing

1. Give your assignment to a partner to review. Mark your partner's text in pencil. You should pay more attention to **language** (tenses, prepositions, spelling, vocabulary etc.) than content, although you should highlight any logical problems that you notice.

2. Return your partner's assignment. Do not hand in your assignment to your teacher, but take it home with you for revisions.

9

Guidelines for Using Grammarly

After the second lesson:

1. Register with grammarly.com and copy&paste your assignment. Mark all corrections suggested by Grammarly on your original printout using two different colours – one colour for the suggestions you decide to reject, and another colour for the suggestions you decide to adopt.

2. For the latter category, write your corrections above the highlighted passages on the original printout of your assignment using a pen or coloured marker.

3. Experiment with the hidden features and make any further corrections you consider appropriate. Use a third colour to highlight these.

Demo document

Remember when you were a careless eight year old kid riding a bike with your friends, racing each other around the neighborhood? Remember that feeling of absolute freedom as you felt the wind in your hair and the smile it put on your face? I never thought I would feel that way as a grown up, until my friends presented me a red brand-new bike. At first, I was a bit skeptical about the total idea of commuting by bike. One morning a couple of days later, I changed completely my mind.

I was stuck at a traffic jam and saw in my rear mirror a man in a suit riding a classy bike with his laptop case in one hand and a handlebar in the other. I figured out it would take him about 15 minutes to get to the office while I was still sitting in my car and waiting for the cars in line ahead to move , even if just for a inch. I was always very afraid of being late for my business meetings.

That is when I decided getting on the bike. I haven't regretted my decision so far. One of the best things about cycling is that the bike is perfect for exercising. Just cycling to and from work or to the shops every day is enough to keep you healthy and happy. Besides, its incredibly

B I U H1 H2 ⧉ ≔ ⋮≡ ⊠   648 words ⏶

33 All suggestions

- eight year old · Add a hyphen

- neighborhood · Change the spelling

- grown up · Add a hyphen

- up, · Remove the comma

- a · Change preposition

- skeptical · Change the spelling

- at · Change preposition

- move , · Remove a space

- a inch · Change the article

- getting · Change the verb form

Hide Assistant

Overall score **64**
See performance

Goals
3 of 5 set

All suggestions

Correctness
30 alerts

Clarity
Very clear

Engagement
Very engaging

Delivery
Slightly off

Premium   16
Advanced suggestions

Get Expert
Writing Help

Plagiarism

Grammarly Demonstration

want and yet you can cover alot of distance. That daily distance I rode to work was no longer enough for me. I started riding to the nearest decent mountain bike trails so I could spent the day going up and down hills. I did it because it was fun. Because I enjoyed it.

"I wish I could bike round the world" I said to myself one day. And than I thought, "Why not?"

OK, I knew I couldn't ride across the oceans. I came up with the idea to ride across each of the continents, from coast to coast. The more I thought about it, the more excited I became about my future plans. If I will do this, I will have to thoroughly prepare, I thought. I was also very scare. Would I be able to make it over towering mountains and across burning deserts? What if I got lost somewhere and didn't know the language?

After a few months of training, I set off. This was hard at first, but soon I realized that everywhere I went people cheered me on when they heared about my journey. The newspape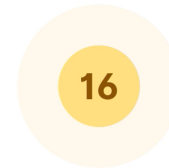r back home reported on my progress. Once or twice I ran out of money and has to spend a couple weeks doing odd jobs before I could continue on my way . I never gave up on my idea, and a year and six month later, I found myself petaling back toward the

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Hide Assistant

Overall score **69**
See performance

Goals
3 of 5 set

All suggestions

Correctness
27 alerts

Clarity
Very clear

Engagement
Very engaging

Delivery
Slightly off

Premium   **16**
Advanced suggestions

Get Expert
Writing Help

Grammarly Demonstration

I ~~for myself~~ find it hard to form a real opinion about this topic. I have to admit, that I am mostly biased by my parents and relatives. Most of them ~~don't~~ [do not] believe that they can make a difference, so why should they even bother trying? My parents do try to use reusable material instead of plastic. But they still have two cars and shop online and do many other things that one should probably avoid doing in order to save the planet. I have no problem with that. I mean, millionaires are out there flying in their private jets and poisoning the environment so why do we have to be the ones to refrain from enjoying ourselves? If all the billionaires in the world would quit using their private planes, we would probably have already saved the world twice.

So, what is saving the environment ~~about~~? [It is] not ~~about~~ how much waste you produce, how much you recycle, and it is certainly not about being totally free of waste. What matters is being mindful ~~about~~ [of] what you buy and what you throw away. Small things like using cotton bags or buying second-hand clothes occasionally can make a difference. If everybody is more conscious about the environment, then we are already a step closer to our goal to save [the] Earth.

✓

suggestions I decided to adopt
s. I rejected
hidden features

~ = Partner
— = me
— = rejected corrections by grammarly
— = adopted ones
~ = hidden mistakes

October 14th, 2019

Language Awareness

Group H

Zero Waste Living

Since the "renaissance" of environmental awareness, thanks to public figures, such as Greta Thunberg, movements such as the one calling for a reduction of personal waste have become ever more popular. As a prime example of what one can do personally, to make a difference, the Zero Waste Living movement has found several followers among my friends and family members.

One such friend of mine, has been quite extreme when applying the principle of avoiding waste at all costs. She refuses to use shampoo and most other hygiene products that are bottled in plastic and resorts to different alternatives such as only using water.

This example and many more moderate supporters of this movement, in my personal [tautology]

Sample Corrections

Grammarly: Main Strengths and Weaknesses

ELT Context

Punctuation

(+) Commas:

- As a woman, I would have to…
- My mother's siblings, on the other hand, saw it as…
- … less waste goes to landfill, which plays a huge role…

- We shouldn't order things online, because of the packaging.
- She answered, that she can reuse the bottle and reduce the amount of plastic she uses. [Premium]
- My mom produces little trash, my grandmother is very similar. [Premium]

Punctuation

(+) Hyphens:

- the so called zero waste lifestyle
- school related products

(–) Possessive apostrophes:

- … plays a huge role in human's health…

Language Preference

American English

- favor
- center
- utilize
- realized
- afterward
- Obligatory Oxford comma

British English

- favour
- centre
- utilise / utilize
- realised / realized
- afterwards
- Optional Oxford comma

Spelling

(+) Individual items:

- i**d**ems
- d**e**vided
- ever**y**time (→ every time)

(−) Capitalization:

- generally not corrected, except personal pronoun *I*

Spelling and Word Choice in Context

(~) Spelling in context:

- to a certain exten**d**

- the first **price** was a car

- to pay the ~~prize~~ (→ **price**)

- to give ~~raise~~ (→ **rise**) to suspicions

- ~~adapt~~ (→ **adopt**) a zero-waste lifestyle

- also detected: very / vary; were / where

Spelling and Word Choice in Context

(~) Spelling in context:

- Even in my family, everyone speaks about this ~~tremendous~~ way of living. [Premium]

- Further steps need to be ~~done~~ (→ **taken**) to preserve it for future generations. [Premium]

- because ~~its~~ (→ **it is**) nearly impossible

- the amount of trash that is ~~send~~ (→ **sent**) to a landfill

Grammar

(+) Prepositions:

- Let's start ~~with~~ (→ **by**) using…

- conscious ~~about~~ (→ **of**) waste

- Concerning the difference ~~of~~ (→ **in**) attitude between…

(+) Articles:

- My friend Laura had a big impact on my view of environment.

- I hope the people all around the world get more concerned about…

Grammar

(~) Agreement:

- local influencer started sharing their experiences…
- local You**T**uber started sharing their experiences…
- I buy sparkling water in glass bottles and recycle it every time.

(+) Adjective / Adverb:

- … both take that topic very ~~serious~~ (→ **seriously**)

Grammar

(~) Tenses: only with obvious markers

- *yesterday* ⇒ past tense
- *since then* ⇒ present perfect

(~) Hypothetical language:

- If I had to change my life into a zero-waste lifestyle, a lot had to change.
- If I ~~would go~~ (→ **went**) with a zero-waste lifestyle, I would need a lot more time to organize my life. [Premium]

Grammar

(–) Word order:

- People are finally getting conscious about how big of an ecological footprint **are they leaving**, and how **is this** harming our planet.

- Not only **I did** not like her, but I also did not trust her.

Style and Register

(–) Passive structures:

- From personal experience, ~~I am enabled~~ to say…
- Further steps need to ~~be taken~~ (→ **take**) to preserve…
- … a rather popular trend, which ~~has been adopted~~ all over the world. [Premium]

(~) Register:

- She performed **way/a lot** better than him.
- It was **kind of** difficult to judge.

Style and Register

(~) Conciseness: "unnecessary", "redundant", "wordy"

- ...attitudes towards trash have ~~definitely/clearly/obviously~~ changed.

- But is this ~~really~~ the case?   *[neutral style]*

- Whenever I think of the trash I ~~personally~~ produce...

- ...taking my ~~own~~ cloth bag with me.

Style and Register

- Our group ~~came to the conclusion~~ (→ **concluded**) that...

- ...we are used to utilising plastic ~~on a daily basis~~ (→ **daily**)

- ... have changed their lifestyle completely ~~in order~~ **to** save the planet

- ~~Despite the fact that~~ (→ **Even though / Although**) older generations may not think about reducing trash…

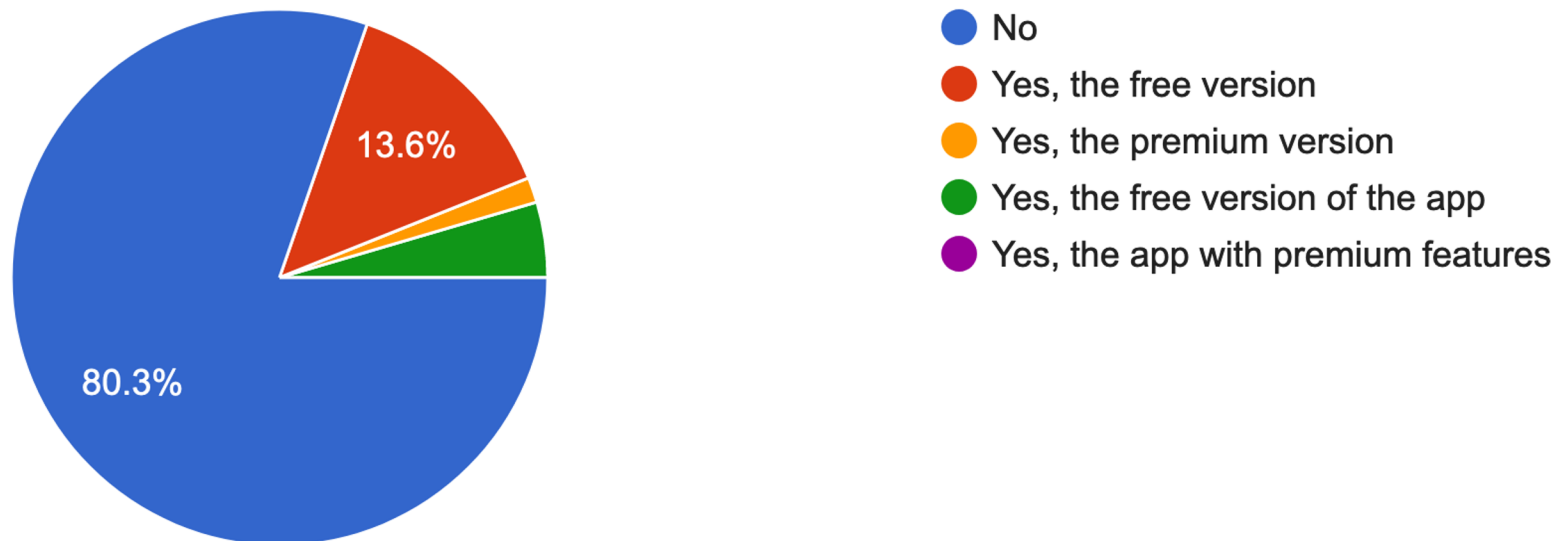- In some areas, my household is already almost without waste ~~due to the fact that~~ (→ **because, since**) we can use old clothes...
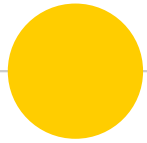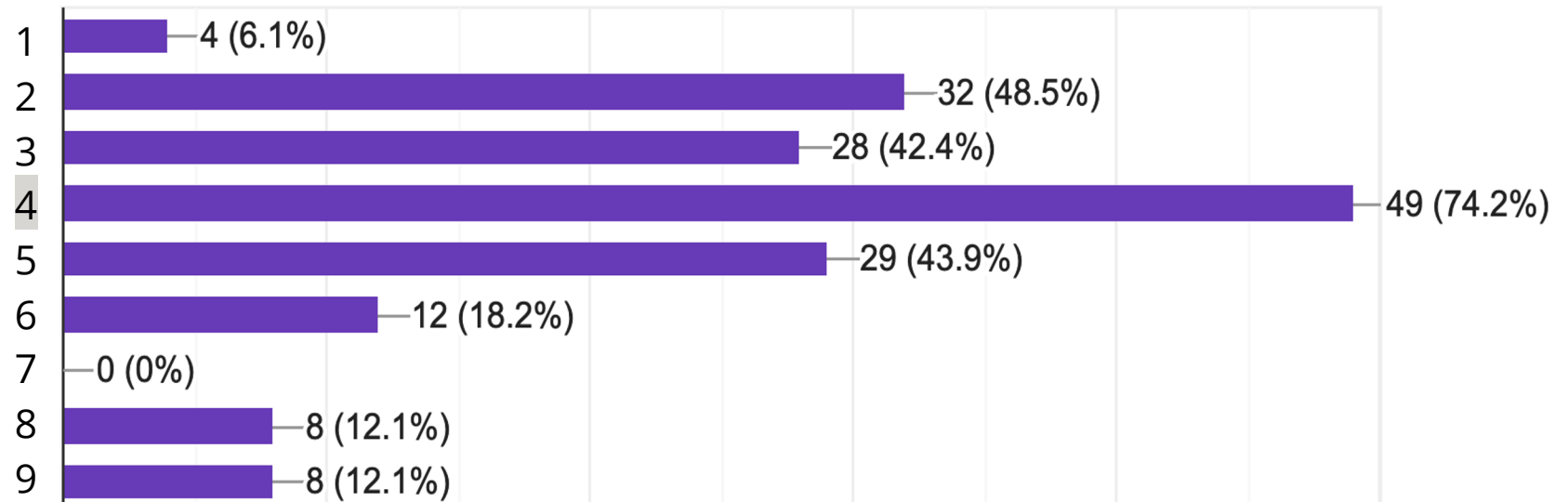
Questionnaire

Students' Reactions

Did you ever use Grammarly before the first assignment for LA1?

66 responses

- No
- Yes, the free version
- Yes, the premium version
- Yes, the free version of the app
- Yes, the app with premium features

80.3%

13.6%

Which tools do you use when you write assignments?

66 responses

1	4 (6.1%)
2	32 (48.5%)
3	28 (42.4%)
4	49 (74.2%)
5	29 (43.9%)
6	12 (18.2%)
7	0 (0%)
8	8 (12.1%)
9	8 (12.1%)

1... None; **2**... Word spellchecker; **3**... Word grammar checker;
4... Bilingual dict.; **5**... Monolingual dict.; **6**... Collocations dict.
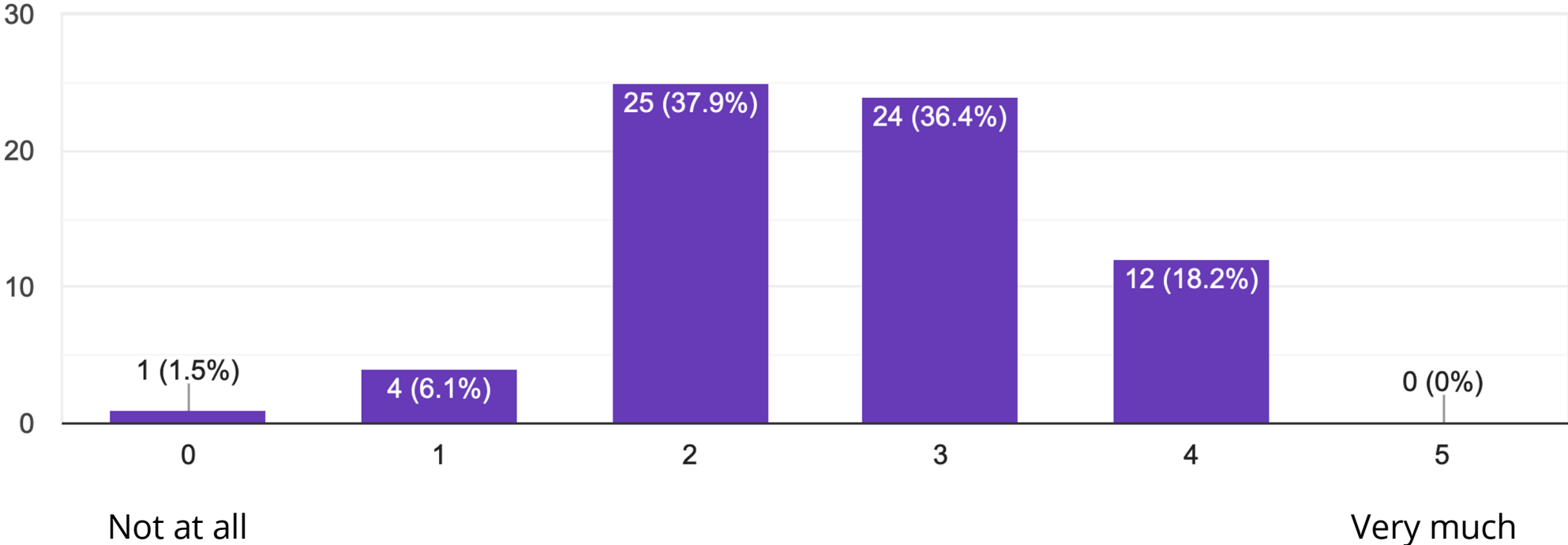**7**... Corpus; **8**... Online forum; **9**... Grammar reference book

30

Do you think that using Grammarly improved your first writing assignment for LA1?
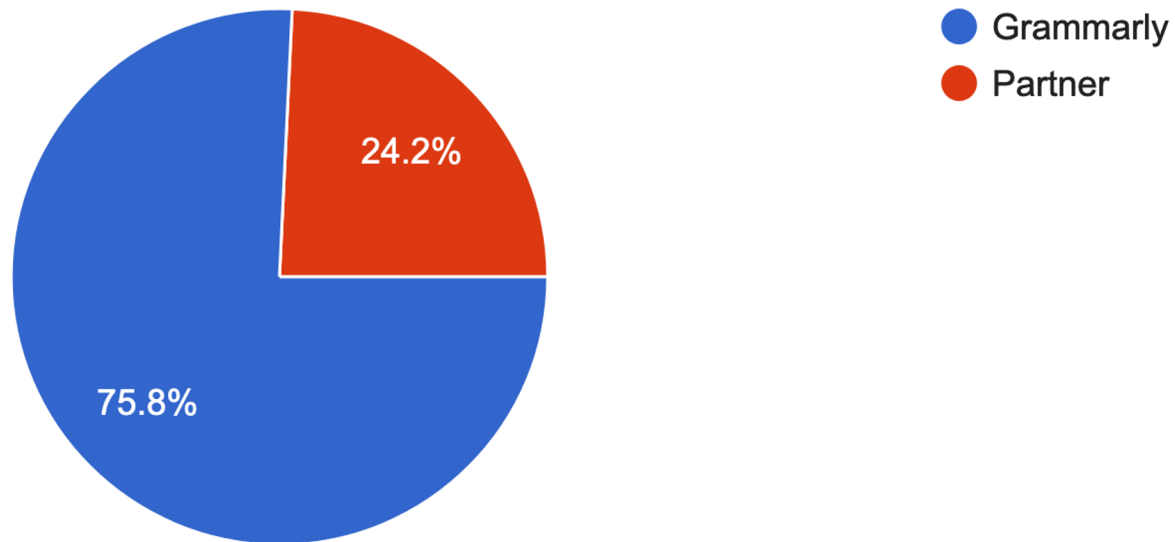
66 responses

- Yes
- No

92.4%

7.6%
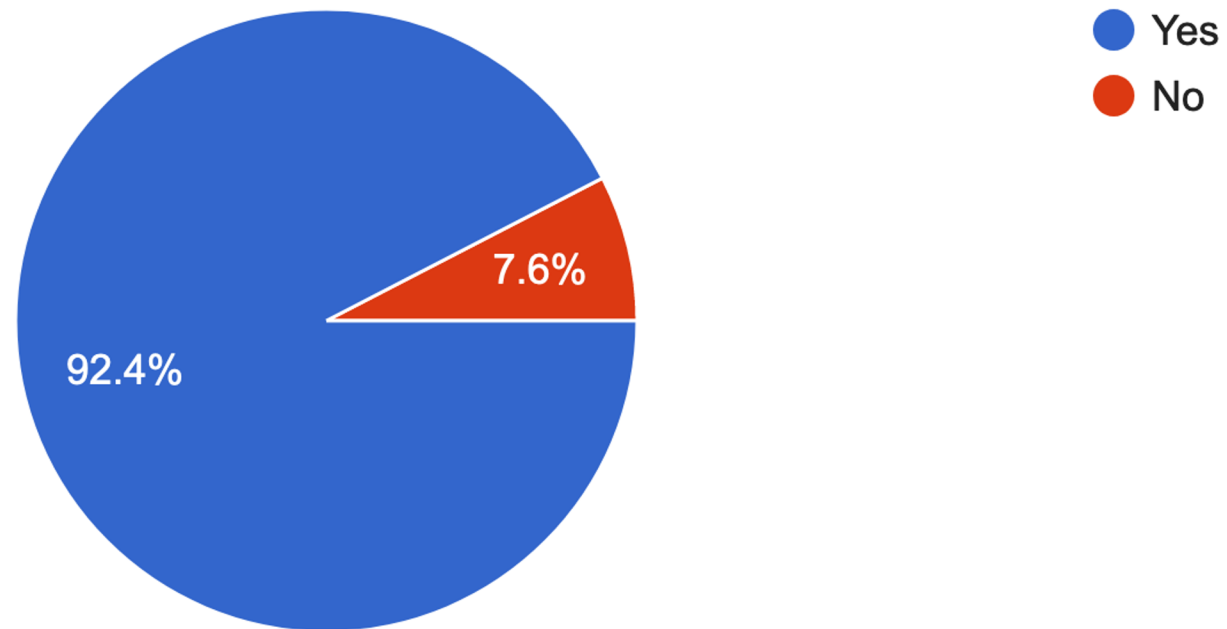
How much do you think using Grammarly improved your assignment?

66 responses

In your opinion, what was more helpful for improving your assignment: Grammarly or your partner's suggestions for revision?
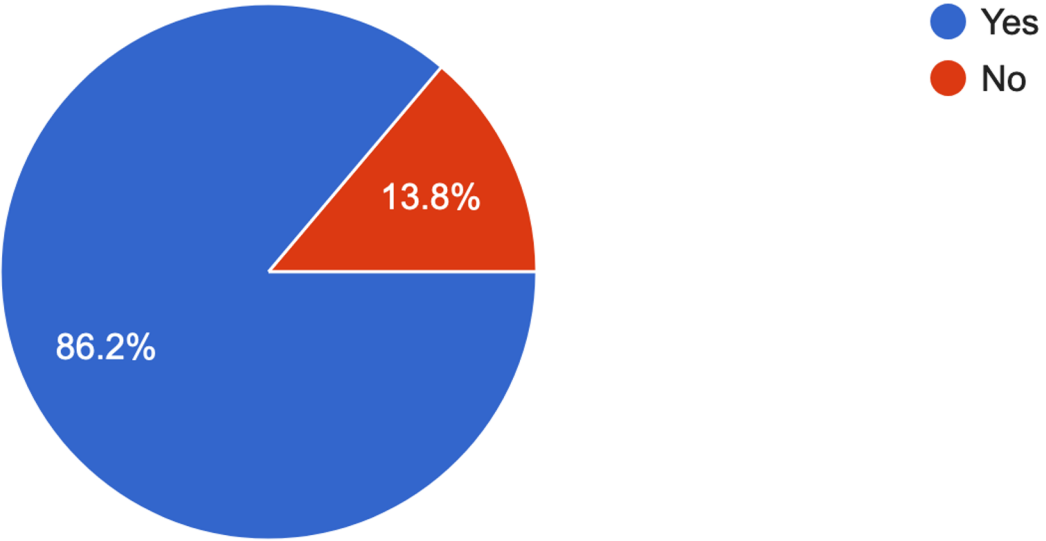
66 responses

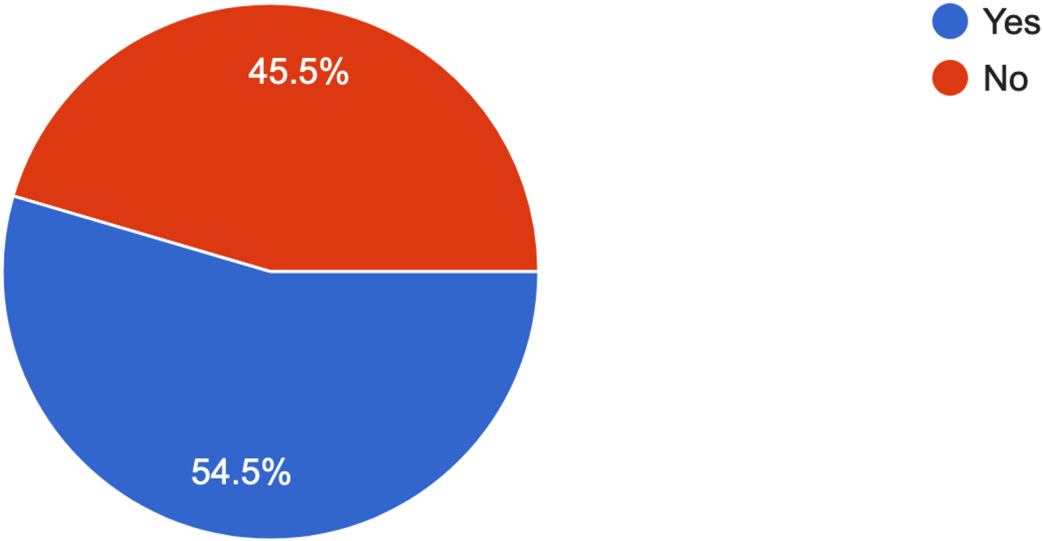(Liaqat, Munteanu & Demmans, 2020)

Overall, do you think the benefits resulting from using Grammarly are worth the additional effort involved?
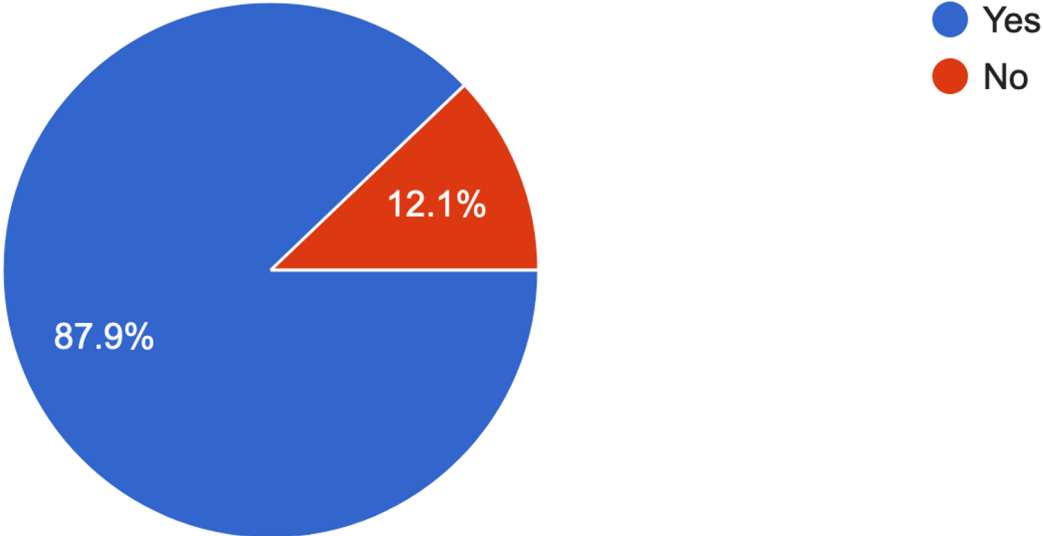
65 responses

- Yes 86.2%
- No 13.8%

Did you use Grammarly for the second assignment (story writing - focus on past tenses)?

66 responses

Legend:
- Yes (blue)
- No (red)

Blue (Yes): 54.5%
Red (No): 45.5%

Do you think you will use Grammarly again in the future?
66 responses

- Yes
- No

12.1%

87.9%

Pedagogical Implications

- student language level: students need sound knowledge of grammar to weed out incorrect suggestions

- familiarity with metalanguage: difficult terms (e.g. "concise", "redundant")

- role of the teacher/facilitator: using an editing tool for language teaching (e.g. be aware of limitations, such as tense use)

- same issues addressed in all texts, regardless of writer's needs: differentiating proficiency levels in future updates?

(Koltovskaia, 2020; O'Neill & Russell, 2019)

References

Dale, R. (2016). Checking in on grammar checking. *Natural Language Engineering*, *22*(3), 491-495.

Dembsey, J. M. (2017). Closing the Grammarly® gaps: A study of claims and feedback from an online
grammar program. *The Writing Center Journal*, 63-100.

Grammarly. (2019, May 17). *How we use AI to enhance your writing | Grammarly Spotlight*.
https://www.grammarly.com/blog/how-grammarly-uses-ai/

Grammarly. (2021). [Homepage]. Retrieved September 10, 2021, from https://www.grammarly.com

Hoover, B. (2019, May 27). *Grammarly's path to effective communication*. Grammarly.
https://www.grammarly.com/blog/grammarlys-path-to-effective-communication/

MathWorks. (n.d.). What is deep learning? 3 things you need to know. Retrieved September 18, 2021, from
https://www.mathworks.com/discovery/deep-learning.html

ONeill, R., & Russell, A. (2019). Stop! Grammar time: University students' perceptions of the automated
feedback program Grammarly. *Australasian Journal of Educational Technology*, *35(*1).