

Text revision in Scientific Writing Assistance: An Overview



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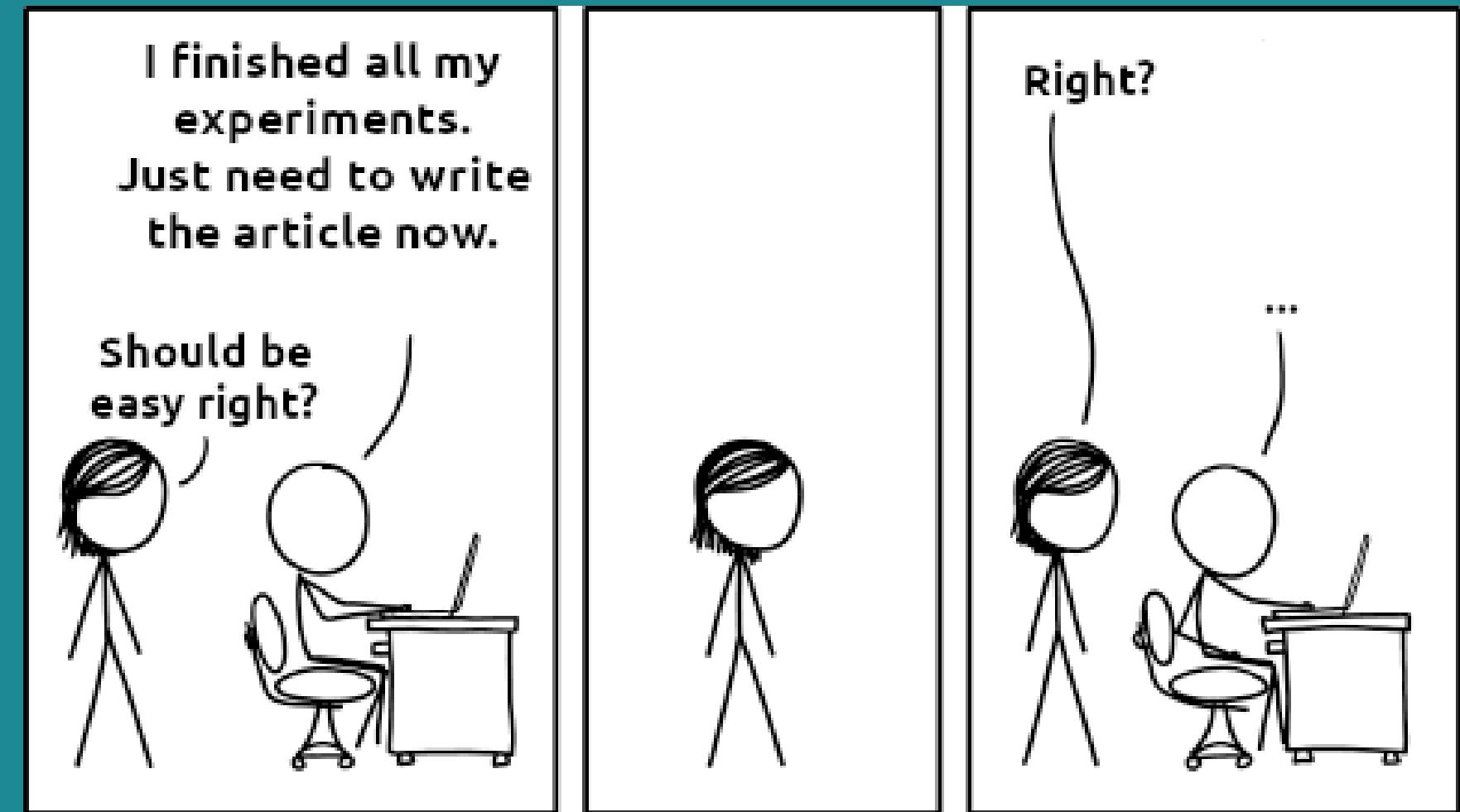


13th International Workshop on
Bibliometric-enhanced Information Retrieval

Introduction

Context:

- Scientific writing assistance tools
- Focus on text revision



©xkcd

Motivations:

- Writing an article is challenging
- Strong writing skills are essential
- Especially difficult for junior researchers and non-native English speakers

Outline

01

Definition of the research article genre and its specificities

02

Definition of the task of text revision in scientific writing assistance

03

Overview of the current approaches and NLP tools for scientific text revision

04

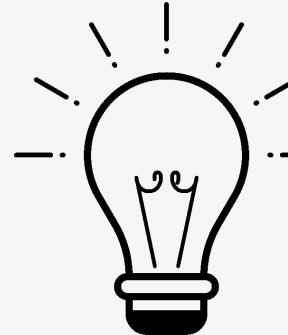
Challenges and future directions

1 - What is Scientific writing?

- Scientific Writing ⊂ Academic writing
- **Academic writing**
 - Context : University setting
 - Form: Essay, thesis, syllabus, articles ...
- **Scientific writing**
 - Form: articles published in journals or conferences
 - **Specificities:**
 - mostly written in English
 - concise, precise, clear
 - codified usage of tenses, pronouns and terminology

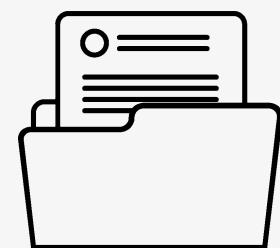


The structure of scientific articles: IMRaD



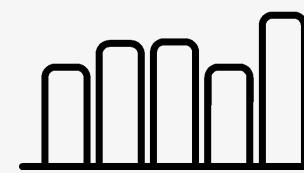
Introduction:

- Gives context and problematic



Methods:

- Describes the research design



Results:

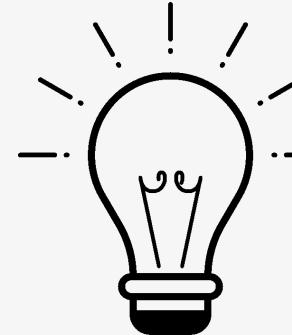
- Presents the findings of the study



Discussion:

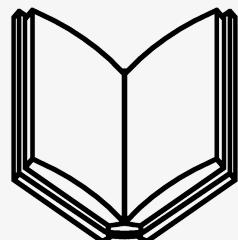
- Interprets and discusses the results
- Suggests directions for future research

The structure of scientific articles: IMRaD



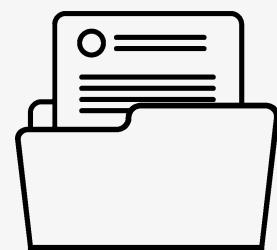
Introduction:

- Gives context and problematic



Literature review/Related work:

- Discusses previous research



Methods:

- Describes the research design



Results:

- Presents the findings of the study



Discussion:

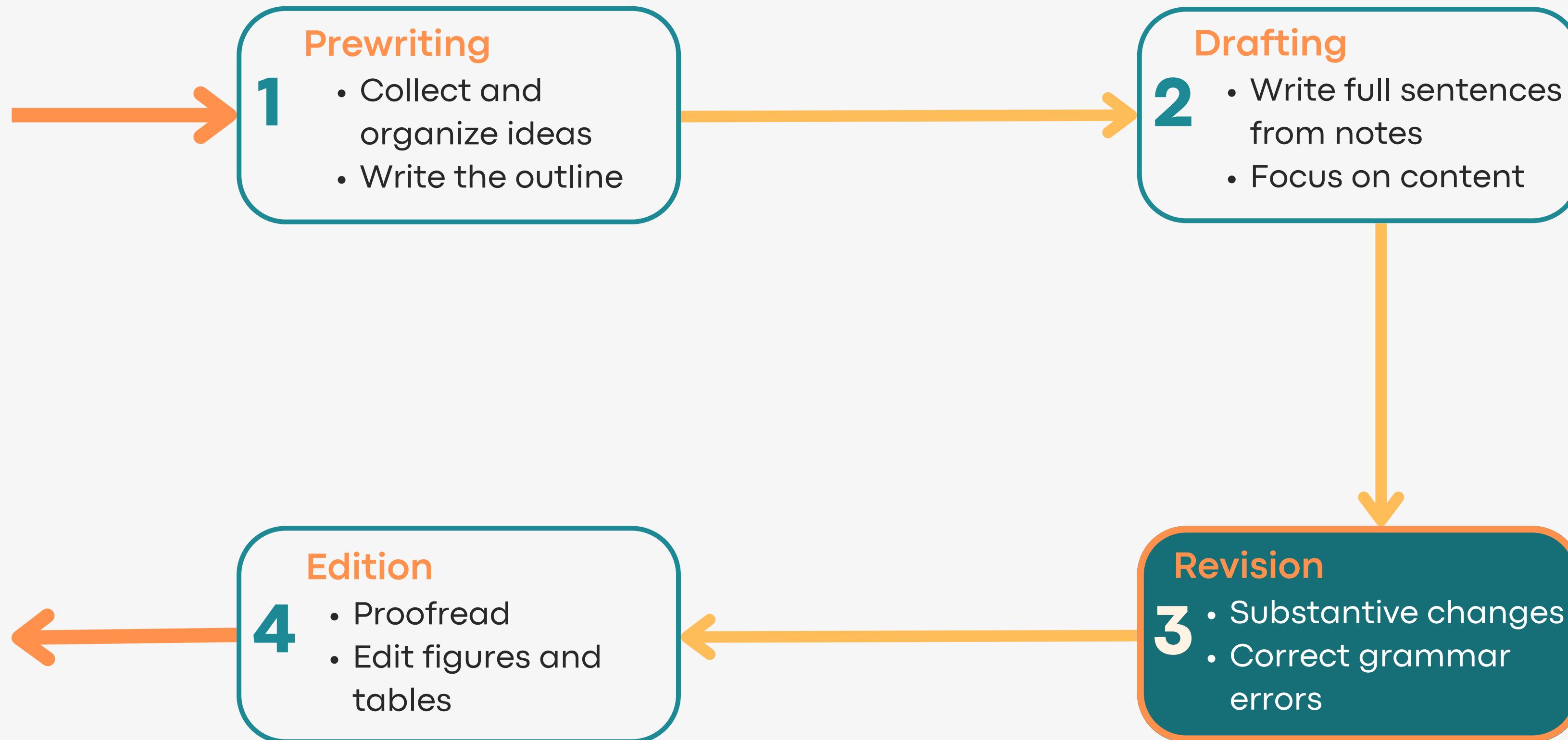
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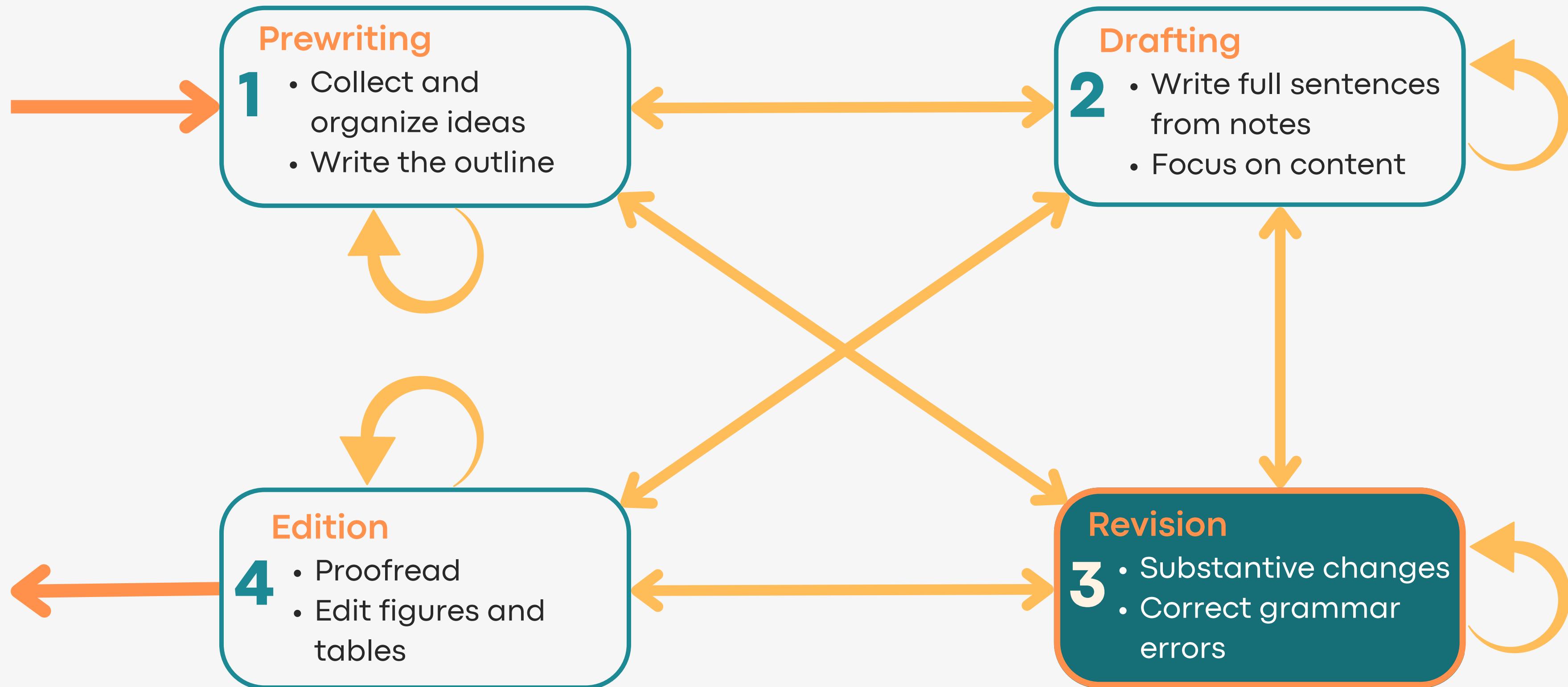
Conclusion:

- Summarizes the key elements

The writing process of scientific articles

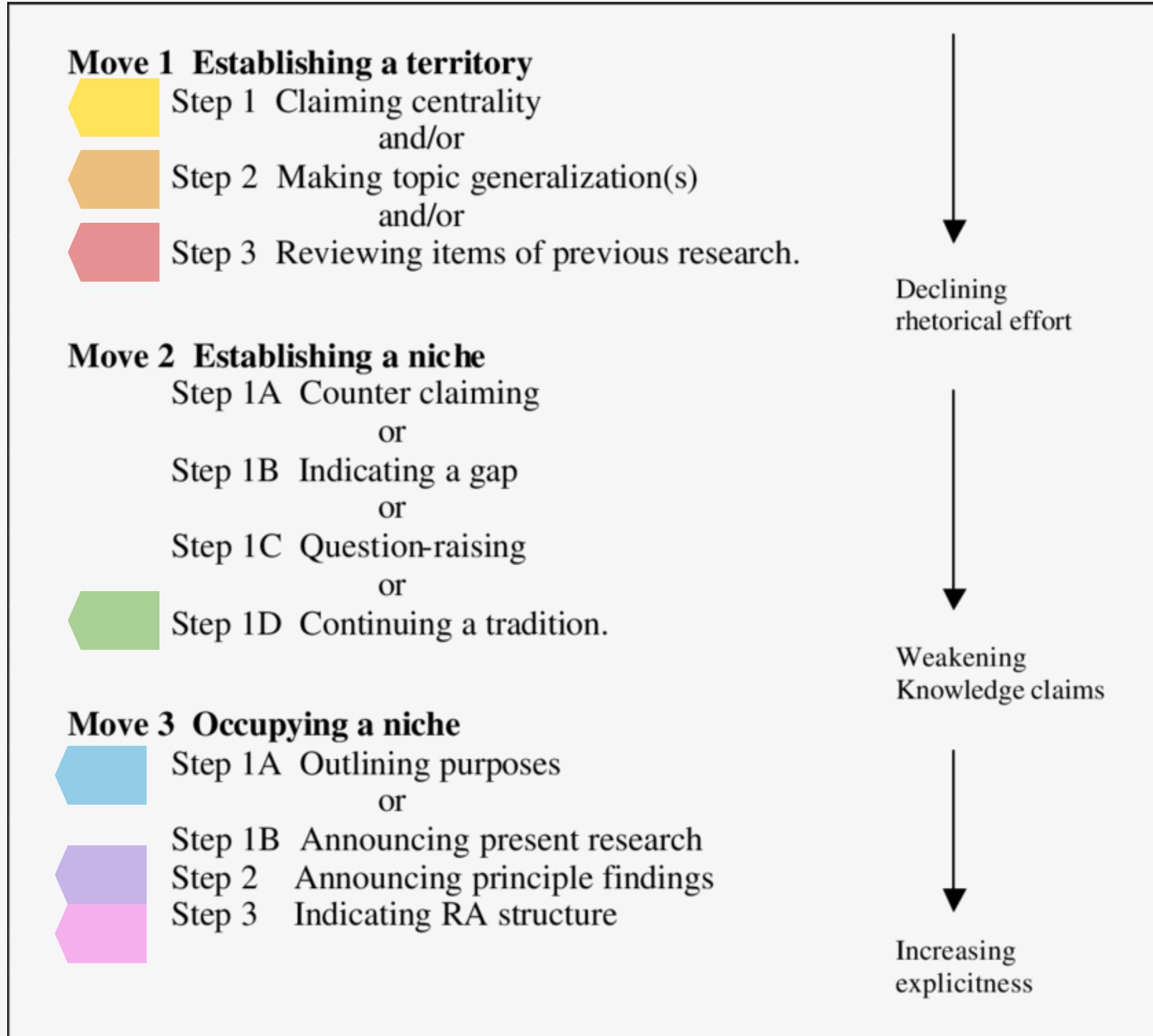


The writing process of scientific articles



Modelization of the argumentative structure

The CARS model (Swales, 1990)

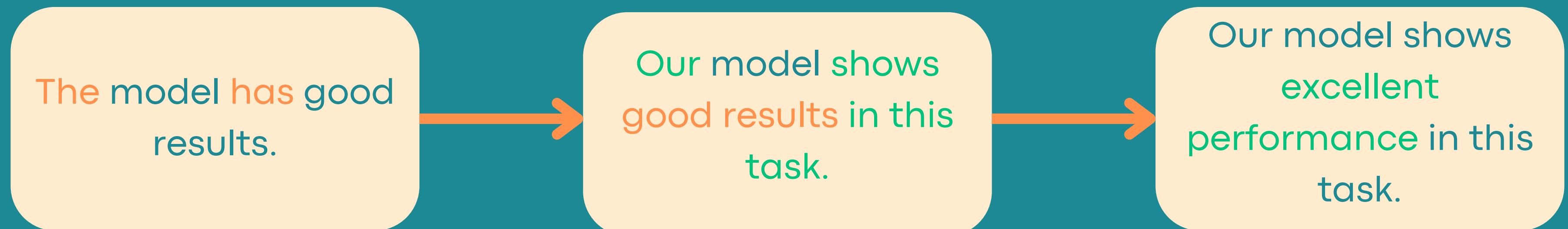


An exemple of introduction labeled with the CARS model

2 - The text revision task

Definition: Text revision is the transformation of an input text into an improved version fitting a desired attribute (formality, clarity, etc.), closer to the intended text

Example:



2 - The text revision task

3 types of tools:

01

Sentence
revision
tools

02

Grammar
checkers

03

Moves
annotators

3 - Currently available tools

Sentence revision tools

R3 →

Editing suggestions

Global crude oil prices spiked by over US\$4 per barrel yesterday after news came in that a major pipeline BEFORE → FLUENCY pipeline AFTER in Minnesota had exploded and caught fire, killing two workers. The pipeline carries oil from Saskatchewan, Canada to close to Chicago, United States, and this oil represents 16% of America's total oil imports. The section BEFORE → FLUENCY the AFTER pipe that exploded was undergoing maintenance at the time to address a pinhole leak first identified three weeks earlier, and patched at the time with a metal sleeve. On Wednesday, the entire section was removed and replaced with a new one. However, when BEFORE → COHERENCE When AFTER oil was reintroduced on Thursday morning, oil leaked where the new section joined the pre-existing pipe, triggering the fatal explosion. The fire was extinguished BEFORE → FLUENCY extinguished AFTER later the same day. The line is split between four separate BEFORE → FLUENCY separate AFTER pipes. After the explosion, all four BEFORE → FLUENCY pipes AFTER were shut down, resulting in the global price surge, but this subsided for the most part after it became clear that the three undamaged pipelines had returned to normal operation, restoring 80% of the line's capacity, and that the accident pipe is expected to be back in use in a matter of days. Embridge identified the deceased as Dave Mussati Jr. and Arnovich, both of whom were contract workers based in Superior, Wisconsin. The damaged section is in Clearbrook, which is approximately BEFORE → FLUENCY approximately AFTER 350 miles west of Minneapolis. Embridge metallurgists have been sent to examine the failed section in an effort to determine the cause of the accident. Other Embridge workers are working to clear spilled oil from the site. It is expected that once this is complete, the pipe will return to service. Crude oil trading closed yesterday slightly above original BEFORE → FLUENCY original AFTER prices

1/8

pipeline BEFORE → FLUENCY
pipeline AFTERReplacement by
FLUENCY

Prev

Reject or Accept

 Reject
 Accept

Confirm

Next

Submit

Interaction panel

Tool	Year	Domain	Approach	Availability
Langsmith	2020	Scientific		Free and paid plans
R3	2022	General/ Scientific	Transformer based	Open source
Chat GPT	2023	General		Free and paid plans

3 - Currently available tools

Grammar checkers

- grammar error correction (GEC)
- spelling error correction (SEC)

Untitled document

Premium suggestions Back to all suggestions X HIDE ASSISTANT >

We found **6 additional writing issues** in this text available only for Premium users.

77 Overall score See performance >

Goals Adjust goals >

All suggestions

Correctness 5 alerts

Clarity A bit unclear

Engagement Engaging

Delivery Just right

Premium 6 Advanced suggestions

Get Expert Writing Help

Plagiarism

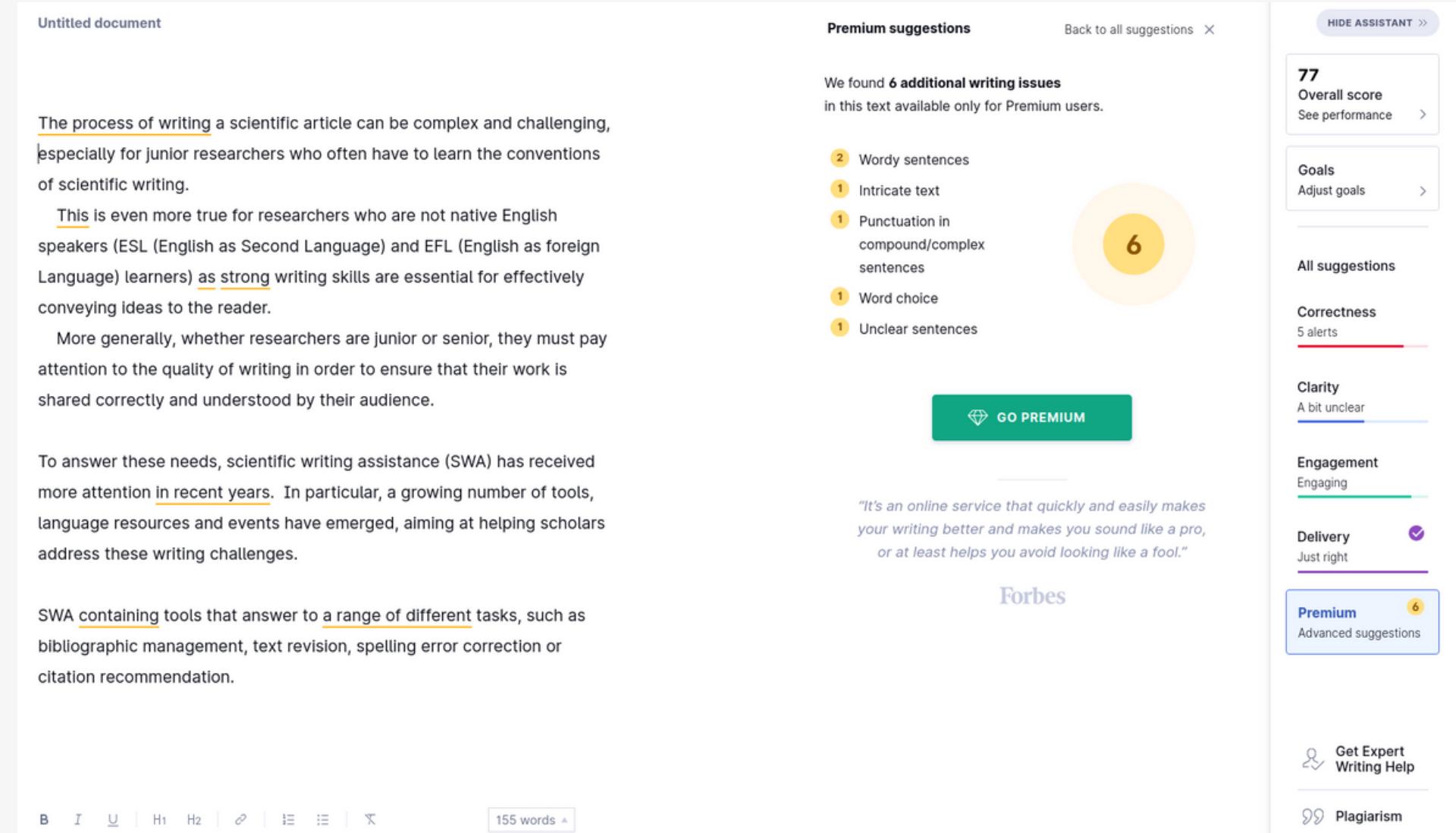
The process of writing a scientific article can be complex and challenging, especially for junior researchers who often have to learn the conventions of scientific writing. This is even more true for researchers who are not native English speakers (ESL (English as Second Language) and EFL (English as foreign Language) learners) as strong writing skills are essential for effectively conveying ideas to the reader. More generally, whether researchers are junior or senior, they must pay attention to the quality of writing in order to ensure that their work is shared correctly and understood by their audience. To answer these needs, scientific writing assistance (SWA) has received more attention in recent years. In particular, a growing number of tools, language resources and events have emerged, aiming at helping scholars address these writing challenges. SWA containing tools that answer to a range of different tasks, such as bibliographic management, text revision, spelling error correction or citation recommendation.

B I U | H1 H2 | ⌂ | ⓘ | ⓘ | ⓘ | ⓘ 155 words ▾

GO PREMIUM

"It's an online service that quickly and easily makes your writing better and makes you sound like a pro, or at least helps you avoid looking like a fool."

Forbes



LinggleWrite ↑

Tool	Year	Domain	Approach	Availability
Grammarly	2023	General	Transformer based	Free and paid plans
LinggleWrite	2020	Academic	LSTM/ Bi-LSTM	Free to use

3 - Currently available tools

Move annotators

- dedicated to academic writing
- highlight the moves
- Help in the revision task by vizualisation

Introduction Methods Editing Results Discussion

Enter or edit text below:

EXPERIMENTAL STUDY OF THE WEB-BASED COURSE
 Twenty university students (non-native English speakers, majoring in Computer Science) from Southwest Normal University in China participated in this experiment via the Internet. The participants were randomly divided into two groups and assigned to different treatment conditions (see Table 3). The first group was assigned to the intra-personal treatment (i.e., where language is used for a functional purpose) comprised of a note-taking task and a dictation task (abbreviated as N + D). The other group was assigned to inter-personal treatment (i.e., where language is used for a communication purpose) comprised of an information-gap task (abbreviated as IG). Materials

The prototype course consisted of 20 dialogues. Each dialogue contained three videos from simple to complex (specified to support the same instructional goal, though by different dialogue strategies)¹ and a set of questions in different task types as described in the Course Structure section, above. The structured or unstructured input video clips are based on the topic "Search". The task types are defined as dictation, note-taking, and information-gap. The lesson contents were selected based on the participants' current knowledge level and course strategies. The selection of level of the video for each dialogue was left to the students themselves. The default level was based on the participants' progress. However, if the participants were not satisfied with the default level, they were able to select their own preferred level (see video levels in Figure 2).

Words: 1028 Goal: 636 to 2385

Change Draft: Draft2 2013/10/09 14:01 ▾

Analyze

Export Options

Instrumentation

The independent variable was defined as type of treatment. The dependent variables were achievement and attitude. The achievement variable was used to address the extent of learning associated with the two treatments, N + G and IG, respectively. The attitude variable was employed to address the degree of motivation reported for the Web-based communication platform as well as the different tutorial functions.

The tracked data (i.e., the participants' written responses to each question) were used to measure the participants' levels of achievement. The first session was used to acquaint the participants with the training process and was therefore not scored. Three of the remaining 19 dialogues were randomly selected to be scored and were used to measure the participants' achievement in L2 learning in the Web-based CALL environment.

Finn's (1977) type and token analysis was employed to score participant responses. Hunt's (1977) T-unit² word count was also used to measure their syntactic complexity. Types are the number of different words used in the participants' responses. The tokens are the total number of words written. The number of types reflects a direct measure of the breadth of subject-specific vocabulary items acquired. The token analysis was conducted on T-units. The assumption is that the length of the T-unit increases as learners mature or develop intellectually (Hunt, 1977).

FEEDBACK (Click on text above for sentence level feedback)

You are likely providing general orientation, giving theoretical, empirical, or informational background relevant to the results of your study here.

Comments

Analysis

MOVE 1. APPROACHING THE NICHE ⓘ You: 93%
0% – 4% 4% – 11% 11% – 14%
not enough goal too much
>> 1 step(s) needs work | 2 step(s) good work

MOVE 2. OCCUPYING THE NICHE ⓘ You: 6%
26% – 43% 43% – 77% 77% – 94%
not enough goal too much
>> 1 step(s) needs work | 1 step(s) good work

MOVE 3. CONSTRUING THE NICHE ⓘ You: 1%
0% – 6% 6% – 22% 22% – 30%
not enough goal too much
>> 4 step(s) needs work | 1 step(s) good work

Tool	Year	Domain	Approach	Availability
Mover	2016	Academic	Naive Bayes Classifier	Free to use
RWT	-	Academic	Probabilistic models	Limited access
AcaWriter	2022	Academic	Rule-based	Open source

↑ RWT

4 - Future directions and challenges

1 Benchmark performance

- Evaluation process to compare the tools' performances

2 Improve revisions models

- Consider a larger context
- Include the argumentative structure

3 Improve accessibility and transparency

4 Emergence of ethical issues

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Sentence revision tools

The Langsmith Editor interface features a main text area with a dark background and light text. At the top, there's a toolbar with icons for file operations, a magnifying glass, a bell, and other tools. A sidebar on the right contains various icons for document management. The text in the main area discusses the challenges faced by non-native English speakers in academic writing and introduces the Langsmith editor.

Langsmith Editor Temporarily saved to browser local

File Tools Help

Field: Natural language processing Section Name: Not specified Where to Rewrite

Langsmith Editor

1 Despite the current diversity and inclusion initiatives in the academic community, researchers with a non-native command of English still face significant barrier when writing papers in English.

2 This paper presents the Langsmith editor, which assists

Langsmith

The OpenReview API interface shows a message indicating that history is temporarily unavailable while they work to restore it. Below this, a detailed document analysis is presented, comparing different versions of a paragraph using academic style. The analysis highlights changes in clarity, coherence, fluency, meaning, and style.

+ New chat

History is temporarily unavailable. We're working to restore this feature as soon as possible.

LE leane.jourdan@outlook.fr
Peux-tu réviser et corriger ce paragraphe dans un style académique (en LaTeX) : "L'objectif est de collecter l'intégralité des documents disponibles sur la plateforme à ce moment-là. Pour cela, on utilise l'API fournie par OpenReview et l'outil \texttt{wget} pour Python. Grâce aux fonctions proposées par l'API pour Python, on commence par collecter la liste de l'ensemble des événements (workshop, conférences et autres appelés \texttt{textrit(invitations)} dans la documentation de l'API). Grâce à cette liste, pour chaque événement on collecte l'ensemble des identifiants des forums associés. Grâce à ces identifiants de forum, on peut collecter les métadonnées associées aux différentes versions d'un même papier, les relectures (messages postés sur le forum). On utilise l'outil \texttt{textrit(wget)} pour collecter les pdf des différentes versions du papier qui sont disponibles sur le site. (Toutes les versions ne sont pas disponibles). Enfin, on crée un fichier de mapping entre l'identifiant du forum (identifiant du papier final) et l'identifiant des références ainsi qu'un fichier de mapping entre l'identifiant du forum et celui des relectures pour une utilisation facilitée du corpus."

Voici une version corrigée du paragraphe en utilisant un style académique et en respectant la grammaire, la syntaxe et la terminologie appropriées :

L'objectif de cette étude est de collecter exhaustivement l'ensemble des documents disponibles sur la plateforme à un moment donné. Pour y parvenir, nous avons recours à l'API fournie par OpenReview ainsi qu'à l'outil \texttt{textrit(wget)} pour Python. En utilisant les fonctions proposées par l'API pour Python, nous avons commencé par collecter la liste de tous les événements, y compris les ateliers, les conférences et autres invitations mentionnées dans la documentation de l'API.

Grâce à cette liste, nous avons collecté l'ensemble des identifiants des forums associés à chaque événement. En utilisant ces identifiants, nous avons pu collecter les métadonnées associées aux différentes versions d'un même document, y compris les messages de relecture postés sur les forums. Nous avons également utilisé l'outil \texttt{textrit(wget)} pour collecter les fichiers PDF des différentes versions du document disponibles sur le site (toutes les versions ne sont pas n Regenerate response IS).

ChatGPT Mar 14 Version. Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.

ChatGPT

CLARITY COHERENCE FLUENCY MEANING-CHANGED OTHERS STYLE

current revision cycle: 1 Edit Intentions

65-86353-depth-1: Global crude oil prices spiked by over US\$4 per barrel yesterday after news came in ...

Global crude oil prices spiked by over US\$4 per barrel yesterday after news came in that a major pipeline BEFORE → FLUENCY pipeline AFTER in Minnesota had exploded and caught fire, killing two workers. The pipeline carries oil from Saskatchewan, Canada to close to Chicago, United States, and this oil represents 16% of America's total oil imports. The section of BEFORE → FLUENCY the AFTER pipe that exploded was undergoing maintenance at the time to address a pinhole leak first identified three weeks earlier, and patched at the time with a metal sleeve. On Wednesday, the entire section was removed and replaced with a new one. However, when BEFORE → COHERENCE When AFTER oil was reintroduced on Thursday morning, oil leaked where the new section joined the pre-existing pipe, triggering the fatal explosion. The fire was extinguished BEFORE → FLUENCY extinguished AFTER later the same day. The line is split between four separate BEFORE → FLUENCY separate AFTER pipes. After the explosion, all four BEFORE → FLUENCY pipes AFTER were shut down, resulting in the global price surge, but this subsided for the most part after it became clear that the three undamaged pipelines had returned to normal operation, restoring 80% of the line's capacity, and that the accident pipe is expected to be back in use in a matter of days. Embridge identified the deceased as Dave Mussati Jr. and Arnovich, both of whom were contract workers based in Superior, Wisconsin. The damaged section is in Clearbrook, which is approximately BEFORE → FLUENCY approximately AFTER 350 miles west of Minneapolis. Embridge metallurgists have been sent to examine the failed section in an effort to determine the cause of the accident. Other Embridge workers are working to clear spilled oil from the site. It is expected that once this is complete, the pipe will return to service. Crude oil trading closed yesterday slightly above original BEFORE → FLUENCY original AFTER prices

1/8

pipeline BEFORE → FLUENCY pipeline AFTER

Replacement by FLUENCY

Prev Reject or Accept Reject Accept Confirm Next Submit

Editing suggestions Interaction panel

Grammar checkers

Untitled document

The process of writing a scientific article can be complex and challenging, especially for junior researchers who often have to learn the conventions of scientific writing. This is even more true for researchers who are not native English speakers (ESL (English as Second Language) and EFL (English as foreign Language) learners) as strong writing skills are essential for effectively conveying ideas to the reader. More generally, whether researchers are junior or senior, they must pay attention to the quality of writing in order to ensure that their work is shared correctly and understood by their audience.

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SWA containing tools that answer to a range of different tasks, such as bibliographic management, text revision, spelling error correction or citation recommendation.

B I U H1 H2 ⌂ ⌃ ⌄ ⌅ ⌆

155 words ▲

Grammarly

I received your letter, so I am writing to you to give you some informations about me. I would like to travel on July because I finish school on June and I go to the Great Britain August for one month.

Sentence-level feedback

This seems to be a good sentence.
This sentence could maybe be improved.
There are some problems in this sentence.

Check again
Keep writing

Writing Suggestion

A

FINISH

- [V n] 32 V school, V job, V sentence
She finished (the concert) with a song from her first album.
她以自己第一張專輯中的一首歌作為（音樂會的）結尾。
- [V adv] 15 V third, V first, V fourth
She finished second (= in second place) in the finals.
她在決賽中獲得了第二名。
- [V -ing] 8 V reading, V eating, V talking
Have you finished reading that magazine?
你看完那本雜誌了嗎？
- [V with n] 7 V with point, V with yard, V with record
The play finishes with a wedding.
這齣戲以一場婚禮結束。

Writing Proficiency

B

CEFR Level A2 A1 A2 B1 B2 C1 C2

Select a sentence to detect grammatical errors

C

I received your letter, so I am writing to you to give you some informations about me. I would like to travel on July because I finish school on June and I go to the Great Britain August for one month.

Click an error marked with Insert Delete Replace to receive suggestions

D

I would like to travel on July because I finish school on June and I go to the Great Britain INSERT August for one month.

school_June

N-gram	Percent	Count	Example
school in June	62.1%	7,933	Show

- From the date upon which I am writing until the close of school in June the work will consist of longer runs as the speed of the students can safely be increased.
- In a major speech at the Central Party School in June last year , Hu exhorted

LinggleWrite

Move annotators

76 AntMover 1.0 (Structural Analysis Software) Laurence Anthony, 2003

File Settings Tools Project: computer_science_abstracts

Directory antmover antmover_testing_data\antmover_demo.txt

antmover_testing

Class 2 (Making_Topic_Generalizations) 2nd Opinion
Teaching learners about the common structural patterns used in different types of texts , such as the abstract and introduction of research papers , has proved successful in many ESP reading and writing courses .

Class 5 (Indicating_a_Gap) 2nd Opinion
However , a major problem faced by researchers when analyzing texts is the vast amount of time needed to conduct the analysis .

Class 2 (Making_Topic_Generalizations) 2nd Opinion
This has led to many studies reporting only preliminary findings , based on a small corpus of target texts .

Class 9 (Announcing_Present_Research) 2nd Opinion
In this paper , we propose a computer system that uses machine learning to automatically identify the structure of texts , enabling researchers to quickly and effectively process very large corpora .

Class 11 (Evaluation_of_Research) 2nd Opinion
The system also has applications in the classroom as a teacher resource when evaluating and selecting texts that highlight certain features , and as a student resource when conducting data - driven learning .

Finished creating feature probabilities
Log Active project is computer_science_abstracts

Original Processed Moves Outline Optimize flow Add to Training Delete Delete All Exit

Mover

Law essay

AcaWriter works fastest with short texts, so if you're only working on a specific section, don't paste in the whole document. It still processes long texts, but it may take a few minutes to get your feedback to you.

B I U E =

Technology is an enabler in providing greater access to justice through its ability to connect people with legal needs to legal assistance, information, and advice. With the increasing popularity of internet-enabled hand held devices and laptop computers, there is a tendency to assume that even the socio-economically vulnerable in our society have access to technology and the skills to use online services with confidence. This is not necessarily the case.

Examples of the application of technology to provide legal information and assistance include case studies, guides and virtual legal advice clinics. The 2012 Review does not address the role of courts in serving the legal needs of the community. The court system is not regarded as a part of the wider legal assistance services. This omission questions the role of the court in facilitating access to its services, including dispute resolution and trials. It also identified uses of technology to expand the delivery of services, many of which are transferable to an online court. These services include e-access for remote communities, availability outside of business hours, interactive processes and virtual appearances. This essay will discuss uses of technology to expand the delivery of services, many of which are transferable to an online court.

Get Feedback >

Computers don't read writing like humans. So, if you're sure your writing's good, it's fine to disagree with AcaWriter's feedback, just like you'd ignore a poor grammar suggestion.

Analytical Report

Feedback

Examples

i The analytical report highlights salient rhetorical moves AcaWriter identified in your essay for reflection. For more specific feedback, go to the Feedback tab.

Rhetorical Moves

- S** Summarises or signals the authors goals
- E** Emphasis to highlight key ideas
- C** Contrasting idea, tension or critical insight
- S** Surprising or unexpected finding
- T** Trend or tendency related to ideas

- P** Perspective or stance
- N** Novel improvements in ideas
- B** Background information and previous work
- O** Question or gap in previous knowledge

Technology is an enabler in providing greater access to justice through its ability to connect people with legal needs to legal assistance, information, and advice. **T** With the increasing popularity of internet-enabled hand held devices and laptop computers, there is a tendency to assume that even the socio-economically vulnerable in our society have access to technology and the skills to use online services with confidence. This is not necessarily the case.

Examples of the application of technology to provide legal information and assistance include case studies, guides and virtual legal advice clinics. **S C** The 2012 Review does not address the role of courts in serving the legal needs of the community. The court system is not regarded as a part of the wider legal assistance services. **C** This omission questions the role of the court in facilitating access to its services, including dispute resolution and trials. It also identified uses of technology to expand the delivery of services, many of which are transferable to an online court. These services include e-access for remote communities, availability outside of business hours, interactive processes and virtual appearances. This essay will discuss uses of technology to expand the delivery of services, many of which are transferable to an online court.

AcaWriter

Introduction Methods Editing Results Discussion

Enter or edit text below:

EXPERIMENTAL STUDY OF THE WEB-BASED COURSE
Twenty university students (non-native English speakers, majoring in Computer Science) from Southwest Normal University in China participated in this experiment via the Internet. The participants were randomly divided into two groups and assigned to different treatment conditions (see Table 3). The first group was assigned to the intra-personal treatment (i.e., where language is used for a functional purpose) comprised of a note-taking task and a dictation task (abbreviated as N + D). The other group was assigned to inter-personal treatment (i.e., where language is used for a communication purpose) comprised of an information-gap task (abbreviated as IG). Materials

The prototype course consisted of 20 dialogues. Each dialogue contained three videos from simple to complex (specified to support the same instructional goal, though by different dialogue strategies) and a set of questions in different task types as described in the Course Structure section, above. The structured or unstructured input video clips are based on the topic "Search". The task types are defined as dictation, note-taking, and information-gap. The lesson contents were selected based on the participants' current knowledge level and course strategies. The selection of level of the video for each dialogue was left to the students themselves. The default level was based on the participants' progress. However, if the participants were not satisfied with the default level, they were able to select their own preferred level (see video levels in Figure 2).

Instrumentation

The independent variable was defined as type of treatment. The dependent variables were achievement and attitude. The achievement variable was used to address the extent of learning associated with the two treatments, N + G and IG, respectively. The attitude variable was employed to address the degree of motivation reported for the Web-based communication platform as well as the different tutorial functions.

The tracked data (i.e., the participants' written responses to each question) were used to measure the participants' levels of achievement. The first session was used to acquaint the participants with the training process and was therefore not scored. Three of the remaining 19 dialogues were randomly selected to be scored and were used to measure the participants' achievement in L2 learning in the Web-based CALL environment.

Finn's (1977) type and token analysis was employed to score participant responses. Hunt's (1977) T-unit/word count was also used to measure their syntactic complexity. Types are the number of different words used in the participants' responses. The tokens are the total number of words written. The number of types reflects a direct measure of the breadth of subject-specific vocabulary items acquired. The token analysis was conducted on T-units. The assumption is that the length of the T-unit increases as learners mature or develop intellectually (Hunt, 1977).

Analysis

MOVE 1. APPROACHING THE NICHE **?**
You: 93%
0% - 4% 4% - 11% 11% - 14%
not enough goal too much
1 step(s) needs work | 2 step(s) good work >>

MOVE 2. OCCUPYING THE NICHE **?**
You: 6%
26% - 43% 43% - 72% 77% - 94%
not enough goal too much
1 step(s) needs work | 1 step(s) good work >>

MOVE 3. CONSTRUING THE NICHE **?**
You: 1%
0% - 6% 6% - 22% 22% - 30%
not enough goal too much
4 step(s) needs work | 1 step(s) good work >>

FEEDBACK (Click on text above for sentence level feedback)

You are likely providing general orientation, giving theoretical, empirical, or informational background relevant to the results of your study here.

Comments

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