Technical Writing and Presentation
Introduction to Research Writing
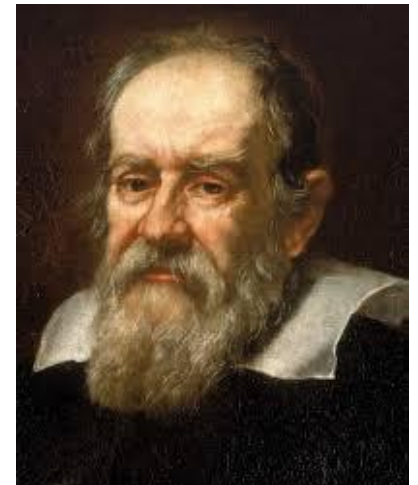
SOICT - 2020

Contents

1. What is research?

2. Publication

3. Structure of a scientific paper

4. Coherence and cohesion

5. Variety and clarity

6. Common grammar and punctuation errors

7. Editing and proofreading

WHAT IS RESEARCH?

What is research?

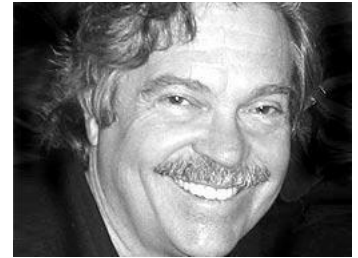"All truths are easy to understand once they are discovered;

the point is to discover them"

"And yet it moves"

Galileo Galilei

"The best way to predict the future is to invent it"

Alan Kay
Computer Scientist

What is research

- ## Cambridge dictionary

a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding
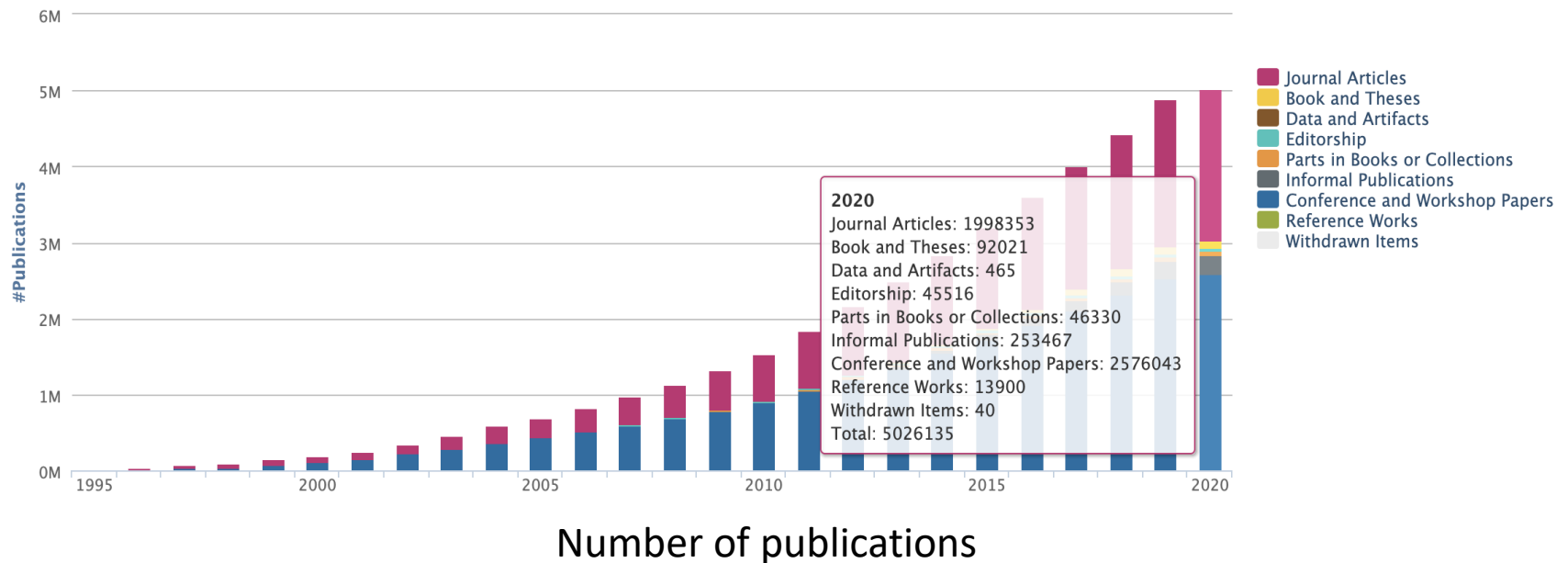
- ## Research Whisperer

Research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way to generate new concepts, methodologies and understandings

PUBLICATION

Publication in Computer Science

- You need publish your work to the world
  - If people don't know about it, they won't use it
  - Increase probability of adoption
- Requirements of writing
  - Standard form, structure
  - Good content, style, organisation
- Requirements of quality
  - a valid publication, published in the right place like in peer-reviewed journals, conferences
  - contain results with sufficient information to enable (i) assess, (ii) repeat experiments
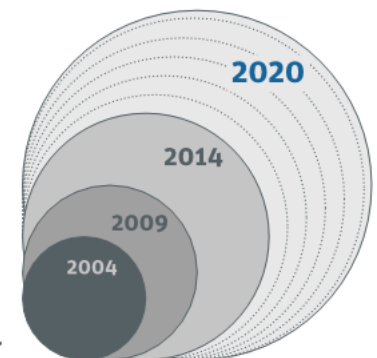
Publication in Computer Science

Number of publications

2020
Journal Articles: 1998353
Book and Theses: 92021
Data and Artifacts: 465
Editorship: 45516
Parts in Books or Collections: 46330
Informal Publications: 253467
Conference and Workshop Papers: 2576043
Reference Works: 13900
Withdrawn Items: 40
Total: 5026135

Legend:
- Journal Articles
- Book and Theses
- Data and Artifacts
- Editorship
- Parts in Books or Collections
- Informal Publications
- Conference and Workshop Papers
- Reference Works
- Withdrawn Items

In dblp, you now find publications from …

- **5,800+** conference and workshop series
- **1,600+** journals
- **90,000+** table of contents

The database has **doubled in size** during the course of just **six years**.

In **2019**, about **450,000+ new publications** have been added to dblp.

2020
2014
2009
2004

Source: DBLP

- Kinds of scientific publication: book, dissertation, conference proceedings, journal article, etc.

book

conference proceedings
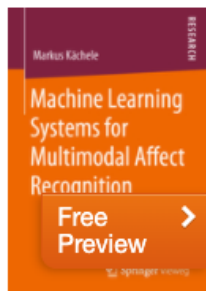
dissertation

journal

Publication in Computer Science

- Book: most often a monograph written by specialist(s), reviewed by experts, focuses on a specific topic

- Dissertation: scientific work of Phd students

- Conference proceedings: a collection of papers, posters presented at a conference

- Journal article: final "extened version" of a conference paper

Publication in Computer Science

Conference paper

- Have page limits
- Provide higher visibility and greater impact
- More timely
- High requirement of novelty

Journal article

- Unlimited/longer page limits
- Opportunity to revise and re-submit paper for review
- Longer review
- Require 30% content to be new, compared to eariler conference version

1	Journal of Statistical Software	journal	17.569 Q1
2	Molecular Systems Biology	journal	7.040 Q1
3	Journal of Operations Management	journal	6.481 Q1

Title	Acronym	Source	Rank
Computer Aided Verification	CAV	CORE2018	A*
ACM Conference on Computer and Communications Security	CCS	CORE2018	A*
IEEE Conference on Computer Vision and Pattern Recognition	CVPR	CORE2018	A*

Publication in Computer Science

- Ranked publications
  - Scimago - Journals: https://www.scimagojr.com/journalrank.php?area=1700
  - CORE - Conferences: http://portal.core.edu.au/conf-ranks/
- List of Call for papers: http://www.wikicfp.com/cfp/
- Researchers' publications: https://dblp.uni-trier.de/pers, https://scholar.google.com/

STRUCTURE OF A SCIENTIFIC PAPER

Structure of a scientific paper

- Three core parts in a paper: introduction, body, and discussion
    - Introduction: general motivations and research problems
    - Body: research methods and results in detail
    - Discussion: general conclusions and implications from the results
- Additional parts: title, abstract, references, appendix, acknowledgment

Structure of a scientific paper
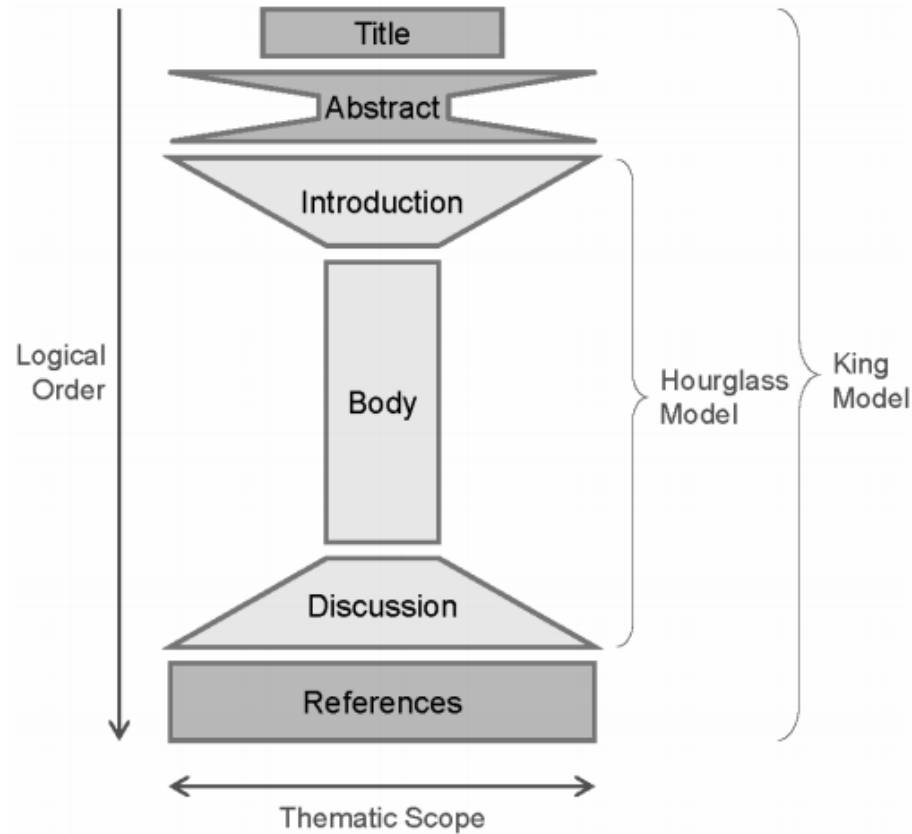
Parts in a paper

Source: Michael Derntl, Basics of research paper writing and publishing, Int. J. Technology Enhanced Learning, Vol 6, No. 2, 2014

Title

www.chili.vn › ... › Xu hướng kinh doanh ▾ Translate this page
Kĩ Năng Giật Tít Để Kéo Khách Hiệu Quả – Blogs Kiến Thức ...
★★★★★ Rating: 5 - 1 vote
Tuy nhiên "**giật tít**" như thế nào để không phản cảm, không trái thuần phong mỹ ... và cũng là cần câu để khách hàng quyết định có nên click vào xem **hay** không. ... "Chia sẻ **cách** SEO website mới tạo lên top nhanh chóng",… đây là những tít ...

tuhoccontent.com › cach-viet-tieu-de-hay ▾ Translate this page
Hướng dẫn cách viết tiêu đề hay "hú hồn", giúp tăng CTR trên ...
Jump to Tiêu đề câu view, **giật tít** - Một sự thật khá đau lòng là hầu như những tiêu đề câu view, **giật tít** đều có tỉ lệ nhấp chuột khủng. Nó khơi gợi sự tò mò ...

vietads.net.vn › Góc nhìn Marketing ▾ Translate this page
20 công thức "giật tít" hấp dẫn khiến người đọc không thể ...

1. Cảnh báo: Những điều bạn phải biết về _____
2. Đừng đọc bài viết này nếu _____
3. Lật tẩy những cách kiếm tiền bằng_____
4. 4 lời nói dối về _____; cứ tin nếu bạn muốn
5. Kinh ngạc bí mật sau_____
6. Hé lộ điều ít ai biết về_____
7. 5 cạm bẫy của _____: tạm biệt _____ mãi mãi

ways to attract Vietnamese news readers
J4F

- read first and most often
- good title "the fewest possible words that adequately describe the contents of the paper"
  - identify the main issue of the paper
  - accurate, unambiguos, specific, and complete
  - do not contain abbreviations unless they are well known e.g., HTML, CPU
  - attract readers

17

Title – Different types

- Descriptive titles: describe what the paper is about
  - Investigating the role of academic conferences on shaping the research agenda
- Declarative titles: make a statement about the results presented in the paper
  - Academic conferences shape the short-term research agenda
- Interrogative titles: pose a question
  - Do academic conferences shape the research agenda?
- Compound titles: combined approach
  - Do academic conferences shape the research agenda? An empirical investigation

Title – Examples

- Review some examples belows:
    - 'Educational Technology and Culture: The Influence of Ethnic and Professional Culture on Learners' Technology Acceptance'
    - 'HT06, tagging paper, taxonomy, Flickr, academic article, to read'
    - 'A New Framework for Dynamic Adaptations and Actions'
    - 'Go To Statement Considered Harmful'

Abstract

- One-paragraph summary of the whole paper
- Two types of abtract
  - Informative abstract: extracts everything relevant from the paper, an aggregated substitute for the full paper
  - Descriptive abstract: describe outline of the paper
- Checklist
  - Motivation: why do we care the problem and results?
  - Problem: what problem that the paper is trying to solve
  - Solution: what was done
  - Results: what is the answer to the problem
  - Implications: what does the answer imply?

Abstract - Example

Paper interfaces for learning geometry

- Motivation
- Problem
- Solution
- Results
- Implications

Unsupervised auto-tagging for learning object enrichment

- Motivation
- Problem
- Solution
- Results
- Implications

Abstract - Example

	Paper interfaces for learning geometry		Unsupervised auto-tagging for learning object enrichment	
Motivation	-	Paper interfaces offer tremendous possibilities for geometry educaiton in primary schools	-	Online presence is becoming an essential part of learning
			-	Large porition of learning meterial is availabe
Problem	-	Existing computer interfaces do not consider the integration of school tools	-	Challenge to ensure accessibility, support retrieval and comsumption of learning objects
	-	Tools disregard classroom-level		
Solution	-	Augmented reality-based tabletop system with interface elements made of paper	-	Automatically annotate specific learning resources using method α-TaggingLDA
	-	Conduct an exploratory user study based on three learning activities.		
Results	-		-	Automatically generated tages were preferred 35% more than the original authors' annotations
Implications	-		-	Automatic tagging facilitates effective informaiton access to relevant learning objects

Introduction

- Leads the reader from a general subject area to a particular field of research
- Three phrases
  - Establish a territory: point out the importance of the subject, present an overview on current research
  - Establish a niche: oppose an existing assumption or reveal a research gap or formulate a problem
  - Occupy the niche: sketch the intent of own work and/or outline important characteristics of the work, important results

Body

- Answers two questions:
  - How was the research question addressed?
  - What was found?
- Comprise serveral sections, subsections
- Example
  - Empirical paper: describes material, data used for the study, methodology and results obtained
  - Case study paper: describes the application of existing methods, theory, or tools.
  - Theory paper: describes principles, concepts, models on which work is based

Discussion

- Other terms: Discussion and Conclusion, Conclusion, etc.
- Contains
  - Background information of the research aim
  - Brief summary of the results
  - Comparision of results with previously published work
  - Conclusions or hypothesis drawn from the results
  - Outlook on future work

References

- Cite related work at the end of the paper
- Many formats/styles for citing a paper, and listing references
- Some common styles
  - Name and year system: e.g., Chuck and Norris (2003) define...
  - Alphabet-number system: As reported in [4],...
  - Citation order system: similar to the alphabet-number system with one difference, i.e., references in the order of apperance in the text
- Two rules
  - Every cited sources must be listed
  - Every listed sources must be cited

COHERENCE AND COHESION

Coherence and Cohesion

- Vital feature of writing in order to enhance reader's understanding of text
- Coherence
  - Connection of ideas at the idea level
  - Refers "rhetorical" aspect of writing which includes developing arguments, organizing and clarifying ideas
- Cohesion
  - Connection of ideas at the sentence level
  - Focuses on "grammatical" aspect of writing
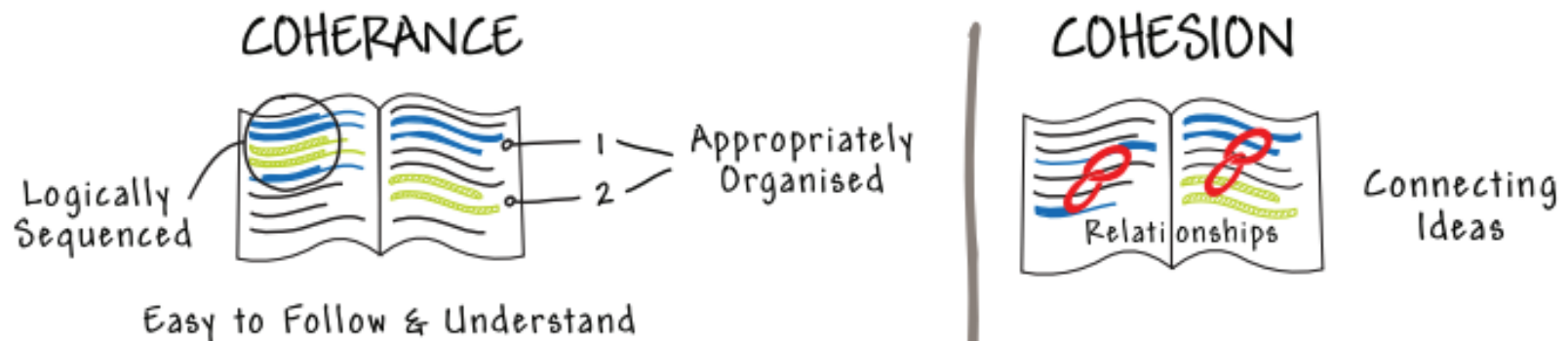
Source: British coucil - IELTS

Cohesion - Approaches

- Repetition: use a particular word/phrase arcross different sentences

- E.g.,

Of course, materials development or adaptation is not the only priority for the professions in South Africa. However, the focus on materials development is appealing because it provides a very tangible and practical focus for speech and language therapists (Pascoe et al., 2013).

- Synonyms: use a word/phrase which has a similar meaning to a keyword in the first sentence

- E.g.

The purpose of *population genetics* *is to quantify and explain the processes generating variation in natural populations (Vargo & Husseneder, 2011).* *Sociogenetic* *studies of eusocial insects are generally based on the approach that the colony functions as a discrete entity within the population (Thorne et al., 1999).*

- Pronous: use a pronoun to refer back to a word/phrase already used

- E.g.

When scientific experiments do not work out as expected, they are often considered failures until some other scientist tries them again. Those that work out better the second time around are the ones that promise the most rewards.

Cohesion – Cohesive Words/Phares

1. **Additive words:** Also, and, as well as, at the same time as, besides, equally important, further, furthermore, in addition, likewise, moreover, too, not only... but also.

2. **Amplification words**: As, for example, for instance, in fact, specifically, such as, that is, to illustrate

3. **Repetitive words**: Again, in other words, that is, to repeat

4. **Contrast words:** But, conversely, despite, even though, however, in contrast, notwithstanding, on the one hand / on the other hand, still, although, though, whereas, yet, nevertheless, on the contrary, in spite of this

5. **Cause and effect words**: Accordingly, as a result, because, consequently, for this reason, since, as, so, then, therefore, thus

6. **Qualifying words**: Although, if, even, therefore, unless

7. **Example**: For example, for instance

8. **Emphasizing words**: Above all, more/most importantly

9. **Reason words**: For this reason, therefore

10. **Order words:** At the same time, firstly, secondly, lastly, next, today/yesterday/next year, then, until, while, in the end, eventually

11. **Explanation:** in other words, that is to day

12. **Attitude:** Of course, fortunately, unfortunately, certainly

13. **Summary:** finally, in conclusion, in short, to summaries

Cohesion - Example

- The hotel is famous. It is one of the most well-known hotels in the country. The latest international dancing competition was held at the hotel. The hotel spent a lot of money to advertise the event. Because the hotel wanted to gain international reputation. But not many people attended the event.

- The hotel, which is one of the most well-known hotels in this region, wanted to promote its image around the world by hosting the latest international dancing competition. Although the event was widely advertised, not many people participated in the competition.

- The latest international dancing competition was held at the hotel, which is one of the most well-known hotels in this region. The hotel spent a lot of money on advertising the event since it wanted to enhance its international reputation; however, it failed to attract many people.

Coherence

- Combincation of every paragraph, every sentence, and every phrase to contribute to the meaning of the whole text
- Two factors: paragraph unity and sentence cohesion
- Paragraph unity:
  - Paragraph must have a topic sentence
  - Every other sentence in the body (i) contains more specific information than the topic sentence and (ii) maintains the same focus of attention as the topic sentence

- ## Paragraph:

As a reminder, please promptly return the lecture notes you borrowed. Slide the notes under my door if I am not there. I may become agitated if you are late, much like my Uncle Chester after several eggnogs on Christmas Eve. Most Christmases I liked to stay up and open my stockings after midnight. Staying up late was exciting and would be repeated a week later at New Year's. So would Uncle Chester's disgraceful behavior.

- ## Cohesion: ?

- ## Coherence: ?

VARIETY AND CLARITY

- Paper containing sentences of one short patterns bores both reader and writer
  - Repetition of simple sentence pattern draws attention to itself, not the ideas
  - Simple or short sentences cannot show many relationships among the ideas
- Should revise the sentences to express the ideas more clearly and add variety to the paper

Variety and Clarity

1. Do adjacent sentences contain the same subject and/or the same verb? If yes, combine them in a single, concise sentence

- Join sentences by omitting a repeated subject (1)

  - Original: Radio advertisements are broadcast daily or weekly. Radio advertisements reach a wide audience.

  - Revision: Radio advertisements are broadcast daily or weekly and reach a wide audience.

Variety and Clarity

1. Do adjacent sentences contain the same subject and/or the same verb? If yes, combine them in a single, concise sentence

- Join the sentences by omitting repeated subjects and verbs and by using adjectives (2)

  - Original: The city council conducted a study of public transportation. The study was lengthy. The study was detailed.

  - Revision: The city council conducted a lengthy, detailed study of public transportation.

Variety and Clarity

1. Do adjacent sentences contain the same subject and/or the same verb? If yes, combine them in a single, concise sentence

- Join the sentences by omitting repeated subjects and verbs and by using adverbs (3)

    - Original: the negotiators worked to gain approval for the contract. The negotiators worked at a steady pace. However, they worked slowly.

    - Revision: The negotiators worked steadily but slowly to gain approval for the contract.

2. Do adjacent sentences contain ideas of equal importance? If yes, use coordination

- Using comma: combines with seven types of conjunctions
  - and/in addition/along with shows addition: The strike divided the town, and it strained labor-management relations.
  - but/however/except/on the other hand shows contrast: Negotiators resolved the strike, but the town remained divided.
  - for/because/the reason shows reason: Coping with environmental issues is a necessary part of industrial studies, for industries affect the environment.

Variety and Clarity

- **so/as a result/therefore** shows logical consequence: Industries affect the environment, **so** coping with environmental issues is a necessary part of industrial studies.

- **nor** shows addition of a negative point: The environment cannot sustain constant resource depletion, nor can it recover quickly from wide-scale resource extraction.

- **or** shows choice: Businesses can design their own programs for recording statistical data, or they can use purchased, pre-designed programs.

- **yet** shows contrast: More secondary schools are implementing programs designed to increase teenagers' awareness of the dangers of drinking and driving, yet alcohol-related traffic accidents continue to be one of the leading causes of death for people between the ages of fifteen and twenty-two

2. Do adjacent sentences contain ideas of equal importance? If yes, use coordination

- Using semicolon: when you want to keep two closely related ideas in one sentence

  - however/but: The actress's performance electrified the audience; however, lighting and sound problems diminished the play's overall impact.

  - furthermore: The project required extensive research; furthermore, budget cuts reduced the available funds.

Variety and Clarity

- **instead/rather:** Neither bold colors nor heavy lines made the painting striking; instead, the sheer size of the canvas drew attention.

- **consequently/as a result**: The speech required preparation and an in-depth analysis of the situation; consequently the student surveyed the population on the issue.

- **nevertheless/however**: The recently established bio-social theory helps us see the evolution of human behavior with a new perspective; nevertheless, few scientists endorse it.

3. Do adjacent sentences contain ideas of unequal importance? If yes, use subordination

- **when, until, after, as soon as, before, ever since, as, while** show a relation that indicates time:
  - Original: The two countries reached an agreement on trade policies. They then were able to complete their peace treaty.
  - Revision: After the two countries reached an agreement on trade policies, they were able to complete their peace treaty.

- **because, since** show a relation that indicates causality
  - Original: The statistics in the proposal were inaccurate. It was this that made the proposal fail.
  - Revision: The proposal failed because its statistics were inaccurate.

- **though, although, even though, while** express concession and contrast of ideas

  - Original: Equipment failures and labor strikes delayed the submarine's completion. Naval engineers continued the project.

  - Revision: Although equipment failures and labor strikes delayed the submarine's completion, naval engineers continued the project.

- **of, as if, provided that, unless, as though** show condition

  - Original: Video game manufacturers plan to impose a rating system to indicate violence. The ratings system will be ineffectual without an accompanying plan for reinforcement.

  - Revision: Unless video game manufacturers issue an accompanying plan for enforcement, their ratings system will be ineffectual.

Variety and Clarity

- **where** indicates place
  - Original: The male hornbill builds a nest for his mate. He chooses a nest site that will protect her and her chicks from predators.
  - Revision: The male hornbill builds a nest for his mate where she and her chicks will be protected from predators.
- **so that** shows result
  - Original: The author wanted people of all income levels to be able to read her book. To achieve this, she stipulated that the book be sold for under five dollars.
  - Revision: So that people of all income levels would be able to read her book, the author stipulated that the book be sold for under five dollars.

- **whichever, whenever, wherever, whoever** indicate general possibility
  - **Original:** `The program's format allows individual users to make changes. This can be done each time users encounter problems in implementing the program.`
  - **Revision:** `The program's format allows individual users to make changes whenever they encounter problems implementing the problem.`
- **more, less than** shows comparison of ideas
  - **Original**: `The beginner's manual contains few technical terms. However, the advanced manual contains several.`
  - **Revision:** `The advanced manual contains more technical terms than the beginner's manual.`

Variety and Clarity

- who, whom, whose, that: persons
  - Original: Peter Tchaikowsky, a Russian composer, lived from 1840 to 1893. He composed Peter and the Wolf.
  - Revision: Peter Tchaikowsky, a Russian composer who lived from 1840 to 1893, composed Peter and the Wolf.

- **that, which**: things
  - Original: Peter and the Wolf is often performed for audiences of children. The composition uses different instruments to represent different characters.
  - Revision: Peter and the Wolf, which uses different instruments to represent different characters, is often performed for audiences of children

- which: explanatory clause
  - Original: The judges scored the performances using a new set of standards. This different method of scoring resulted in unanticipated victories for several new competitors.
  - Revision: The judges scored the performance using a new set of standards, which resulted in unanticipated victories for several new competitors.

- **where**: place; **when**: time
  - Original: A press conference is an ideal place to find out information. Many journalists meet, discuss, and question current political issues at a press conference.
  - Revision: a press conference where many journalists meet, discuss, and question current issues, is an ideal place to find out information.

COMMON GRAMMAR AND PUNCTUATION ERRORS

Common grammar and punctuation errors

1. Subject – Verb agreement errors
- Example 1:
  - Incorrect: An important part of my life have been the people who stood by me
  - Correct: An important part of my life has been the people who stood by me.
- Example 2
  - Incorrect: A huge number has been asked here
  - Correct: A huge number have been asked here
  - The number: singular, a number: plural
- Example 3
  - Incorrect: Each of the women in the class were nurses
  - Correct: Each of the women in the class was nurse

2. Miss comma after introductory element

- Example 1:
  - Incorrect: In case you haven't noticed my real name doesn't appear in the article.
  - Correct: In case you haven't noticed, my real name doesn't appear in the article.

- Example 2
  - Incorrect: Before she had time to think about it Sharon jumped into the icy pool.
  - Correct: Before she had time to think about it, Sharon jumped into the icy pool.

3. Misusing its and it's

- Example 1:
  - Incorrect: I don't believe its finally Friday
  - Correct: I don't believe it's (it is) finally Friday.

- Example 2
  - Incorrect: The cat was licking it's tail.
  - Correct: The cat was licking its tail.

Common grammar and punctuation errors

4. Ambiguous pronoun reference

- Example 1:
  - Incorrect: When Jonathan finally found his dog, he was so happy. (The dog or Jonathan?)
  - Correct: Jonathan was so happy when he finally found his dog.

- Example 2
  - Incorrect: Don felt a lot of anger and bitterness as a result of Marie's decision. This is what ended everything. (What ended everything? Don's anger and bitterness or Marie's decision?)
  - Correct: Don felt a lot of anger and bitterness as a result of Marie's decision. Her choice ended everything.

5. Lack of parallel structure

- Example 1:
  - Incorrect: He wanted to learn more about careers in programming, engineering, biochemist, and research scientist.
  - Correct: He wanted to learn more about careers in programming, engineering, biochemist, and researching scientist.
- Example 2
  - Incorrect: The key directives of his boss were clear:
    - Meet monthly sales quotas.
    - Aggressive marketing techniques.
    - Reporting in every day.
  - Correct: The key directives of his boss were clear:
    - Meet monthly sales quotas.
    - Aggressive marketing techniques.
    - Report in every day.

6. Daling modifier: the intented subject or the modifier is missing from the sentence, an instead another subject appears in its place

- Example 1:
  - Incorrect: While driving to work, a car accident was witnessed on the highway.
  - Correct: While driving to work, Jane witnessed a car accident on the highway.
- Example 2:
  - Incorrect: Having finished the assignment, the TV was turned on
  - Correct: Having finished the assignment, Jill turned on the TV.

6. Daling modifier – Revise the following sentences:

- Having arrived late for practice, a written excuse was needed.

- Without knowing his name, it was difficult to introduce him.

- To improve his results, the experiment was done again.

7. The Oxford comma

- The comma before the final item in a list: standard in Bristish writing

- US writing: skip the last comma, especially in journalism

- It's a matter of preference, no right or wrong when it comes to the Oxford comma

- Example:
  - Oxford comma: My favorite foods are pizza, spaghetti, and steak
  - without Oxford comma: My favorite foods are pizza, spaghetti and steak

EDITING & PROOFREADING

Editing and proofreading strategies

- Same: both demands close and careful reading

- Different: two different stages of the revision stage, using different techniques

- General strategies

  - Get some distance from the text

  - Find a quiet place to work

  - Try chaning the look of the document

  - Use ruler or page, card to read line by line

Editing

- Begin as soon as you finish the first draft
- Reread the draft to see whether the paper is well organized, the tranistion between paragraphs are smooth, etc.
- Edit on several levels
  - Content:
    - Have you done everything the assignment/goal requires?
    - Are the claims make accurate?
    - Is all information in your paper relevant to the assignment/goal?
    - Have you supported each point with adequate evidence?

Editing

- **Edit on several levels**
  - **Overall structure:**
    - Does your paper have an appropriate intro and conclusion?
    - Is it clear how each paragraph in the body is related to the goal?
    - Are the paragraphs arraged in a logical sequence?
    - Have you made clear transitions between paragraphs?
  - **Structure within paragraphs?**
    - Does each paragraph have a clear topic sentence?
    - Does each paragraph stick to one main idea?
    - Are there any extraneous or missing sentences in any paragraphs?

Editing

- **Edit on several levels**
  - **Clarity**
    - Is the meaning of each sentence clear?
    - Is it clear what each pronoun (he, she, it, they, etc.) refers to?
    - Have you chosen the proper words to express your ideas?
    - Have you defined any important terms that might be unclear to reader?
  - **Style**
    - Have you used an appropriated tone (formal, informal, etc.)?
    - Have you varied the length and structure of sentences?
    - Do you tends to use the passive voice too much?

Editing

- Edit on several levels
  - Citations
    - Have you appropriately cited quoted, paragraphs, ideas you got from sources?
    - Are your citations in the correct format?
- After editing at all levels, you make significant revisions to the content and wording of the paper
- Check pattern of error you tend to have for correcting future instances

Proofreading

- The final stage of the editing process
- Only after you have finished all of your other editing revisions
- Focus on surface errors such as misspelling, mistakes in grammar and punctuation

Proofreading

- Don't rely entirely on spelling checkers because they are far from foolproof.
- Proofread for only one kind of error at a time
- Read slow, and read every word
- Separate the text into individual sentences
- Circle every punctuation mark
- Read the paper backwards: useful for checking spelling
- Ignorance may be bliss, but it won't make you a better proofreader. If you're not sure about something, look it up.