

EE 350 – Module 5

Style in Academic Writing

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Technical Essay

A typical technical essay should enable efficient transfer of information and should have

- A clear problem statement
- Description of past work on similar problems, a.k.a., literature survey, and novelty in the new work that is being described
- The proposed solution(s), and results achieved along with all the caveats

Style

- Style of your writing corresponds to the voice, tone, and mood
- It determines how well your audience `gets' what you are saying
- Communicate in the style that a reader expects
 - Surveys & expositions, theoretical, experimental, ...
- Rules provide precision and standardization
 - Rules are encoded in Style manuals of the publishing house
 - Chicago Manual of Style is the key reference (a compendium of about 3,000 rules)
 - “Elements of Style” by Strunk and White is an ageless classic

Broad guidelines

- Objective is clear communication to the reader and making it easy to follow.
 - Be accurate, concise, clear, and objective
 - Avoid using fancy words, especially those that you do not use normally.
- State key conclusions (or results) early; need to convince the reader that they are not wasting their time.
- Have an audience in mind and think about what they know and do not know.
 - Explain your ideas in terms of what they know and not what you know.
- Ensure that there are no spelling errors
 - And language errors that may involve tenses, grammar, sentence & paragraph structuring

Broad guidelines

- **Avoid qualifiers**
 - “rather”, “very”, “little”, “pretty”
- **Avoid fancy words**
 - “discombobulate”, “beauteous”, “Four score and seven years ago”
- **Avoid injecting unwarranted opinion**
 - “previous work is not convincing” (share information not opinion)
- **Avoid overstatement**
 - “my results are very significant”

Broad guidelines (mechanics of writing)

- **Top down design** Starting with an outline and working out the details is the normal way of tackling an engineering problem.
- **Checking your facts** Engineers should be used to checking anything that is even remotely doubtful before committing to it. So should writers.
- **Failure mode analysis** For each sentence ask yourself, could it be misread? How? What is the best way to fix it?
- **Dependency analysis** Are the ideas presented in an order that assures that each point can be understood on the basis of the readers assumed knowledge and the information provided by preceding points?
- **Optimization** Are there any unnecessary parts? Does the structure require the reader to remember too many details at once, before linking them?
- **Structured testing** If you read what you have written assuming only the knowledge that the reader can be expected to have, does each part work the way you intended? If you read it aloud, does it sound the way you intended?

Tenses and abbreviations

- Present tense for known facts, theorems, hypotheses
 - Can also be used to present theorem proofs
- Past tense for experiments conducted and results obtained
- Avoid shifting tenses within the same unit of text: sentence, paragraph, or section
- Do not use contractions like it's, isn't, weren't, won't, ...
- Avoid acronyms except very well known ones
 - Introduce new ones and not so well known ones

Typography

- Punctuation set in same font as the preceding character
- Include the punctuation within the quotation marks
- Display equations and expressions for emphasis;
 - Many a time they can be part of a sentence

Typography: Title

- Uppercase for all nouns, pronouns, adjectives, verbs, adverbs, and subordinating conjunctions (If, Because, That, Which)
- Uppercase abbreviations (i.e., use DC, not dc or Dc)
- Lowercase articles (a, an, the), coordinating conjunctions (and, but, for, or, nor), and most short prepositions
 - Unless they are the first or last word
- Uppercase long prepositions (those of more than three letters)
 - Before, From, Through, With, Versus, Among, Under, Between, Without

Typography: Abstract and Keywords

- Abstract

- All variables should be in light-faced, italic
- Numbers and units remain bold
- Rest of text in bold

- Keywords/Index Terms

- Should appear in alphabetical order
- Capitalize the first word of the list, lowercase the rest
- e.g., "Index Terms—Abstraction, computer-aided system engineering (CASE), conceptual schema, data model, entity type hierarchy, ISO reference model, layered architecture meta model, reverse engineering."

Typography: References and Bibliography

- Provide full information about references and bibliographic material in the style of the publication
 - Use bibtex and the appropriate bibstyle
 - Note that there are different kinds of reference material: books, chapters in edited volumes, journal articles, papers in conference proceedings, miscellaneous documents, websites (provide retrieval date), private communication and unpublished material
 - When creating bibtex entry record the entry appropriately
- While referring in the text
 - Do not say “in reference [1] ...rather “in [1]”
 - Do not say “in Chakravarthy [1]” ... rather “in [1]” or “Chakravarthy [1] has shown that..”
 - Do not say “in Fig. 2 of reference [1]” ... rather in “[1, Fig. 2]”. Similarly, “[1, eq. (8)]”, “[1, Sec. IV]”, “[1, Th. 4.2]”, “[1, Ch. 3]”

Typography: Figures and Tables

- Figures and tables should be placed very close to the place that they are first referenced/explained
 - Placed at the top or bottom of the column/page.
- Captions should have sufficient information about what is being shown/described
- While referring to them in the text
 - Caption number should be cited with the abbreviation “Fig.” and the number, followed by a period, an em-space, and then the text of the caption
 - e.g., “Fig. 1. Theoretical values of n .”
 - In general, do not use A, An, or The at the beginning of figure/table caption

Typography: Math

- Latex provides you with a wide variety of fonts; use them consistently even when referring to them in the text.
- Display equations and expressions for emphasis
 - They can be part of sentences; use the appropriate punctuation at the end of the display
- In text, fractions may be broken down (shilled) multiline (built-up) so they can be placed on one line
- Exponential expressions may be brought down in line with the substitution of “exp” for “e” and the addition of square brackets (e.g., $\exp[-(j\omega t)xyzk]$)
- Use the word “Equation” at the start of a sentence, but in text, just use the number [e.g., in (1)].

Rules of sentence composition

Rules of sentence composition

- Rule 1 - Always use the positive form

| Negative form | Positive form |
|---|---|
| "He was not very often on time." | "He usually came late." |
| "She did not think that studying Latin was a sensible way to use one's time." | "She thought the study of Latin a waste of time." |
| "not honest" | "dishonest" |
| "not important" | "trifling" |
| "did not remember" | "forgot" |
| "did not pay any attention to" | "ignored" |
| "did not have much confidence in" | "distrusted" |

Rules of sentence composition

- Rule 2 – Avoid conditionals

- “Can”, “may”, “would”, “could”, “might” makes you sound unsure/irresolute
- Use them *only when* the described situation indeed involves uncertainty

| With conditional | Without conditional |
|---|--|
| “Applicants can make a good impression by being neat and punctual.” | “Applicants will make a good impression by being good impression if they are neat and punctual.” |
| “Plath may be ranked Plath was one of those among those modern poets who died young.” | “Plath was one of those modern poets who died young.” |

Rules of sentence composition

- Rule 3 – Omit needless words
 - Pursue brevity – omit words/phrases that contribute nothing extra to the meaning

| Verbose form | Succinct form |
|--|------------------------|
| "the question as to whether" | "whether" |
| "there is no doubt that" | "no doubt"/undoubtedly |
| "in a hasty manner" | "hastily" |
| "owing to the fact that" | "since" |
| "in spite of the fact that" | "though" |
| "call your attention to the fact that" | "remind you" |
| "the fact that he had not succeeded" | "his failure" |

Rules of sentence composition

- Rule 4 – Use similar form for co-ordinate and co-relative ideas (rule of “parallelism”)
 - Co-ordinate ideas – expressions which are similar in content and function
 - Co-relative ideas – “both” - “and”; “not only” - “but also”

| Varying form | Similar form |
|---|---|
| “Formerly, science was taught by the textbook method, while now the laboratory method is employed.” | “Formerly, science was taught by the textbook method; now it is taught by the laboratory method.” |
| “His speech was marked by disagreement and scorn for his opponent's position.” | “His speech was marked by disagreement with and scorn for his opponent's position.” |
| “It was both a long ceremony and very tedious.” | “The ceremony was both long and tedious.” |
| “A time not for words but action.” | “A time not for words but for action.” |
| “Either you must grant his request or incur his ill will.” | “You must either grant his request or incur his ill will.” |
| “My objections are, first, the injustice of the measure; second, that it is unconstitutional.” | “My objections are, first, that the measure is unjust; second, that it is unconstitutional.” |

Rules of sentence composition

- **Rule 5 – Keep words related in thought close**
 - Do not insert a phrase or clause between the subject and its verb
 - A relative pronoun (“which”, “that”) should come immediately after its antecedent
 - Modifiers should come next to the words they modify

| Far apart | Close together |
|---|---|
| “He noticed a large stain in the rug that was right in the center. ” | “He noticed a large stain right in the center of the rug. ” |
| “You can call your mother in London and tell her all about George's taking you out to dinner for just two dollars.” | “For just two dollars you can call your mother in London and tell her all about George's taking you out to runner. ” |
| “A dog, if you fail to discipline him, becomes a household pest.” | “Unless disciplined, a dog becomes a household pest.” |
| “This is a portrait of Benjamin Harrison, grandson of William Henry Harrison, who became President in 1889.” | “This is a portrait of Benjamin Harrison, who became President in 1889. He was the grandson of William Henry Harrison.” |
| “The director said he hoped all members would give generously to the Fund at a meeting of the committee yesterday.” | “At a meeting of the committee yesterday, the director said he hoped all members would give generously to the Fund.” |

Rules of sentence composition

- Rule 6 – Number of subject = number of verb
 - Be careful to identify the correct number of the subject

| Incorrect usage | Correct usage |
|--|---|
| "The bittersweet flavor of youth-its trials, its joys, its adventures, its challenges are not soon forgotten." | "The bittersweet flavor of youth - its trials, its joys, its adventures, its challenges is not soon forgotten." |
| "One of the ablest scientists who has attacked this problem" | "One of the ablest scientists who have attacked this problem" |
| "His speech as well as his manner are objectionable." | "His speech as well as his manner is objectionable." |

Commonly confused words

- “Affect” (verb) vs. “Effect” (noun)
- “Alternate” (substitute) vs. “Alternative” (a choice)
- “Among” (involves more than two things) vs. “Between” (involves more than two things, but considers each individually)
- “Compare to” (point out resemblances between different objects) vs. “Compare with” (point out similarities and differences between same objects)
- “Compose” (to make up or form: a set composed of members) vs. “Comprise” (to be made up of; to be formed by: a set comprising members; members comprising a set)
- “Fewer” (modifies plural nouns specifying countable units, e.g., fewer tubes.) vs. “Less” (modifies singular mass nouns and singular abstract nouns, e.g., less air)

Commonly confused words

- “Notice” (just observation) vs. “Note” (requires mental deduction)
- “Conclusions” and not “Conclusion” (you are stating the main conclusions of your work, you are not just concluding the paper)
- “Imply” (something suggested though not expressed) vs. “Infer” (something deduced from evidence)
- “Number” (when objects can be counted: a large number of people) vs. “Amount” (when objects cannot be counted: a large amount of water)
- “Principal” (chief, main, most important - adjective) vs. “Principle” (a rule - noun)
- “That” (defining, restrictive) vs. “Which” (non-defining, non-restrictive)
 - Ask yourself the question “which one?” and if you can answer meaningfully, then use “that”, else use “which”

References/ suggested supplementary content

- “*Elements of Style*, “ Strunk and White, Longman.
- “*IEEE Editorial Style Manual For Authors*.” Available Online.
<https://journals.ieeeauthorcenter.ieee.org/your-role-in-article-production/ieee-editorial-style-manual/>
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- D. R. Morgan, “*Dos and don'ts of technical writing*,” in *IEEE Potentials*, vol. 24, no. 3, pp. 22-25, Aug.-Sept. 2005.
- https://assets.cambridge.org/97805218/99802/excerpt/9780521899802_excerpt.pdf
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