



Original research article

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ABSTRACT

The abstract must span 150 to 200 words and be composed as a single, unstructured paragraph, free of equations or references. It should succinctly outline the research's background or the issue it addresses, describe the method proposed to tackle this issue, and summarize the study's key findings. Format the abstract in Palatino Linotype font, 9-point size, with single spacing, and include 6-point spacing both before and after the text. Additionally, supply 3 to 5 keywords to enhance indexing and visibility. For guidance on optimizing discoverability, refer to resources on crafting effective titles and leveraging search engine optimization techniques.



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1. Introduction

The introduction sets the stage for the research by providing background context and pinpointing the problem it tackles. It begins by exploring the general area of study, explaining why the topic matters and how it connects to broader issues. A literature review of similar past studies establishes the current state-of-the-art, highlighting gaps in existing knowledge that this research seeks to address. This gap analysis positions the study within the wider field, showing its relevance and necessity.

Next, it outlines the research methods, including any innovative approaches or techniques employed. Here, the authors must also describe methods previously used by other researchers for similar problems and explain why the chosen methods are selected for this study. The objectives of the study are clearly stated, along with the

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specific goals it aims to achieve. Finally, it underscores the research's contributions, detailing how its findings enhance understanding or bring fresh perspectives to the field.

2. Material and method

The Materials and methods section delivers a thorough and detailed description of all materials used and procedures followed in the research. It begins by listing all materials—covering equipment, chemicals, and tools—with precise details like brands, model numbers, and quantities to ensure the study can be accurately replicated.

Next, it walks through step-by-step procedures, detailing the experimental design, data collection methods, and analytical techniques applied. These steps should be presented in a logical order, starting with the most critical actions and moving to less essential details.

2.1. *This is a sub-section*

To boost clarity and readability, use sub-section and sub-sub-section to organize different aspects of the materials and methods, making each part of the methodology easy to follow. Include enough detail for replication, along with explanations for why specific methods were chosen and any tweaks made to standard procedures.

2.1.1. *This is a sub-sub-section*

To ensure perfection, this section must be written in Palatino Linotype font, 10-point size, with single spacing. The first line of each paragraph should be indented by 0.5 cm (0.19 inches), and the text should maintain a clear, concise, and engaging tone throughout.

3. Results and discussion

In this section, present and analyze the data gathered during your research. Start by laying out the results of your study clearly and objectively, using tables, figures, or statistical analyses as needed to make your findings easy to grasp. Keep this part focused on the data itself, avoid interpreting the results here and aim for an accurate and thorough presentation.

After presenting the results, move into the discussion portion, where you interpret and break down the findings. Explain how these results tie back to your research questions or hypotheses and stack them up against findings from past studies. Highlight what makes your results significant, dig into any surprising outcomes, and explore their broader implications for the field. Be sure to address any limitations in your study and offer suggestions for future research based on what you've uncovered.

3.1. *Language and style*

Write in clear, concise English, avoiding jargon unless defined. Use active voice where possible (e.g., 'We analyzed the data' rather than 'The data was analyzed'). Proofread for grammar, spelling, and coherence before submission.

3.2. *Tables and figures*

Tables and figures must be numbered sequentially (e.g., Table 1, Fig. 1) and cited in the text before they appear. Provide a concise caption above tables and below figures. For example: "Fig. 1. System architecture" and "Table 1 shows the experimental results." Ensure all visuals are of high resolution (minimum 600 dpi) and referenced appropriately in the text (e.g., "As shown in Fig. 1"). All tables and figures must be cited within the main body of the manuscript to support the narrative or findings.

3.3. Comma usage

These guidelines outline the proper use of commas (,) in manuscripts submitted to this journal. Consistent and accurate punctuation enhances clarity, ensures readability, and aligns with scientific writing standards. Authors are expected to follow these rules throughout their submissions.

1. **Separating Items in a List:** Use commas to separate three or more items in a series, including a serial (Oxford) comma before the final item. Example: "The study examined length, width, and height variations."
2. **Non-Essential Information:** Insert commas around non-restrictive clauses or phrases that provide additional, non-critical details. Example: "The reactor, built in 2020, operated at full capacity."
3. **Joining Independent Clauses:** Place a comma before a coordinating conjunction (e.g., and, but, or) that connects two independent clauses. Example: "Data collection was complete, but analysis took additional time."
4. **Introductory Elements:** Add a comma after introductory phrases or clauses to separate them from the main sentence. Example: "During the experiment, temperature fluctuations were recorded."
5. **Numbers:** Use commas to separate thousands in large numbers (e.g., 5,678). Exceptions may apply for SI units per journal style. Example: "The population sampled was 12,450 individuals."

Table 1
Experiment results.

An example of a column heading	Coloumn A (t)	Coloumn B (t)
And an entry	1	2
And another entry	3	4
And another entry	5	6



Fig 1. Three penguins are arguing about where to play for the whole day; perhaps one fancies the slippery ice slide while another prefers the best fishing spot nearby. Whether they agree on one destination or not, we don't know.

3.4. Period usage

These guidelines outline the proper use of periods (.) in manuscripts submitted to this journal. Consistent and accurate punctuation enhances clarity, ensures readability, and aligns with scientific writing standards. Authors are expected to follow these rules throughout their submissions.

1. **Ending Sentences:** Use a period to mark the end of a complete sentence with a subject and predicate. Keep sentences concise for clarity.
Example: "The results supported the hypothesis."
2. **Abbreviations:** Include periods in common scientific abbreviations, such as "e.g." (for example), "i.e." (that is), and "et al." (and others).
Example: "Similar findings were noted by Lee et al."

3. **Decimal Points:** Use a period as the decimal separator in numerical data, following standard English conventions.
Example: "The p -value was 0.05."
4. **Citation Formatting:** Apply periods to separate components in references, adhering to the journal's citation style.
Example: "Brown, T. (2022). Journal of Engineering."

3.5. Notations

These guidelines outline the proper use of notation in text and equations for manuscripts submitted to this journal, adhering to IEEE Style. Consistent and standardized notation ensures clarity, readability, and professionalism in technical writing. Authors must follow these rules across all sections of their submission.

1. **Units:** Use the International System of Units (SI) for all measurements. Include a space between the number and unit, except for percentages and degrees of angle. Example: "The length was 5 m," "The efficiency reached 95%," "The angle was 45°."
2. **Symbols:** Define all symbols (variables, constants, etc.) the first time they appear in the text or equations, typically in parentheses or a dedicated nomenclature section. Use italic font for variables and roman font for units and operators. Example: "The voltage V (in volts) was measured," "The frequency f = 60 Hz."
3. **Decimals and Thousands:** Use a period (.) as the decimal separator and commas (,) to separate thousands in numbers within the text. Example: "The value was 3.14," "The sample size was 1,234."
4. **Consistency:** Use the same symbol for the same quantity throughout the manuscript. Avoid reusing symbols for different meanings unless clearly redefined.
5. **Mathematical Expressions:** Short expressions in text should be written inline using standard mathematical symbols. Longer or complex expressions should be displayed as equations (see below).
Example: "The power P was calculated as $V \times I$," not "The power P was calculated as V times I ."
6. **Subscripts and Superscripts:** Use subscripts and superscripts for indices, exponents, or qualifiers. Ensure they are clearly formatted in the text.
Example: "The resistance R_1 was higher than R_2 ," "The energy E^2 increased over time."
7. **Acronyms and Abbreviations:** Define acronyms or abbreviations at their first use, followed by the abbreviation in parentheses. Use periods in abbreviations only where traditionally required (e.g., "et al.").
Example: "Signal-to-Noise Ratio (SNR) was optimized," "Results from Smith et al. were compared."
8. **Currency:** Use internationally recognized currency codes (e.g., USD, EUR, IDR) rather than local symbols (e.g., \$, Rp). Include the code after the amount with a space.
Example: "The cost was 500 IDR," not "The cost was Rp500."
9. **Formatting:** Display equations on a separate line, centered, and numbered sequentially in parentheses on the right. Use italic font for variables and roman font for operators (e.g., sin, log).
Example: $V = IR$ (1)
10. **Punctuation:** Treat equations as part of the sentence. Use a comma or period after the equation if it continues or ends the sentence, respectively.
Example: "The current was determined using $I = V/R$, where R is resistance."
Example: "The final result was $E = mc^2$."
11. **Multiple Equations:** Align related equations using alignment tools (e.g., "&" in LaTeX) and number each line if referenced separately.
Example:

$$\begin{aligned} x &= a + b & (2) \\ y &= c - d & (3) \end{aligned}$$

12. **Explanation:** After each equation, briefly explain variables if not previously defined in the text or nomenclature.
Example: " $P = VI$, where P is power (W), V is voltage (V), and I is current (A)."
13. **Software Tools:** Use equation editors (e.g., LaTeX, Microsoft Word Equation Editor) to ensure proper formatting. Avoid handwritten or unformatted symbols.
14. **Nomenclature Section:** Include a separate "Nomenclature" section before the introduction or after the conclusion to list all symbols, their meanings, and units, if the manuscript uses extensive notation.

Example:

V –	Voltage (V)
f –	Frequency (Hz)

15. **References to Equations:** Refer to equations by number in parentheses.

Example: "As shown in (1), the voltage increases linearly."

16. **Clarity:** Ensure notation is unambiguous and distinguishable (e.g., avoid confusing "1" with "l" or "0" with "O").

3.6. Reference and citation

Several factors must be considered when selecting articles as references:

- 1) Citations and references must adhere to IEEE Style.
- 2) A minimum of 30 articles is required, with at least 80% being journal publications.
- 3) The journal prioritizes references from international journals, accredited national journals, and conference proceedings.
- 4) References must be recent, published within the past ten years. For example, articles cited in the 2022 edition should date from 2012 to 2021.
- 5) All referenced articles must include a Digital Object Identifier (DOI) if available.

Teknika encourages authors to utilize software tools such as Mendeley, Zotero, JabRef, or similar applications to manage references and citations efficiently. These tools help streamline source organization and ensure compliance with IEEE Style formatting. Moreover, using such software can reduce errors and save significant time during manuscript preparation.

This journal adopts IEEE Style for referencing and citation. In-text citations appear as numbered references in square brackets, accompanied by a corresponding reference list at the manuscript's end. These guidelines ensure consistency, accuracy, and clarity in source acknowledgment. Authors must follow the rules detailed below for in-text citations and the reference list.

3.7. In-text citation rule

Several in-text citation rules:

1. **Numbering:** Cite sources using numbers in square brackets (e.g., [1]) in the order they first appear in the text. Numbers are assigned sequentially and reused for subsequent mentions of the same source.
Example: "Previous studies [1] showed similar results." Later: "As noted in [1], the method was effective."
2. **Multiple Citations:** List multiple sources in a single bracket, separated by commas, or use a dash for a range if consecutive.
Example: "Research on this topic [2], [5], [7] supports the hypothesis."
Example: "Several works [3]-[6] explored this issue."
3. **Placement:** Place the citation number before punctuation (e.g., comma, period) unless it's part of a parenthetical phrase.
Example: "The data was validated [8], confirming the model's accuracy."
Example: "This aligns with prior findings (e.g., [9])."
4. **Author Names:** Avoid mentioning author names in the text unless necessary for context. Use the citation number instead.
Acceptable: "Smith [10] proposed a new algorithm."
Preferred: "A new algorithm was proposed [10]."
5. **Equations and Figures:** Cite references to equations or figures in the same manner, using the assigned number.
Example: "As derived in [11, eq. (3)], the output increased."

3.8. Reference list rule

Several in-text citation rules:

1. **Order:** List references numerically in the order they are cited in the text, not alphabetically. Each entry corresponds to its in-text citation number.
2. **Format:** Use the following formats for different source types. Include a DOI (Digital Object Identifier) for journal articles if available, prefixed with "doi:".
3. **Punctuation:** Use periods to separate major elements (e.g., author, title, publication details) and commas within elements (e.g., volume, pages).
4. **Titles:** Use sentence case for article/chapter titles (in quotation marks) and book/journal titles (italicized).

3.9. Examples of reference formats

Several example of reference format:

1. Journal Article

Format: [Ref. number] Initial(s). Surname, "Title of article," *Title of Journal*, vol. volume, no. issue, pp. page range, month year, doi: DOI number.

Example:

[1] J. K. Smith, "Analysis of renewable energy systems," *IEEE Trans. Energy Convers.*, vol. 35, no. 2, pp. 123-130, Jun. 2022, doi: 10.1109/TEC.2022.3156789.

2. Conference Paper

Format: [Ref. number] Initial(s). Surname, "Title of paper," in *Proc. Conference Name*, location (if provided), month year, pp. page range.

Example:

[2] A. B. Lee and C. D. Wong, "Optimization of neural networks," in *Proc. IEEE Int. Conf. Artificial Intelligence*, Tokyo, Japan, Aug. 2023, pp. 45-50.

3. Book

Format: [Ref. number] Initial(s). Surname, *Title of Book*, edition (if not first). City, State (or Country): Publisher, year.

Example:

[3] R. T. Johnson, *Fundamentals of Electrical Engineering*, 2nd ed. New York, NY, USA: Wiley, 2020.

4. Book Chapter

Format: [Ref. number] Initial(s). Surname, "Title of chapter," in *Title of Book*, Initial(s). Surname, Ed(s). City, State (or Country): Publisher, year, ch. chapter number, pp. page range.

Example:

[4] M. N. Patel, "Signal processing techniques," in *Advanced Digital Systems*, T. K. Brown, Ed. Boston, MA, USA: Springer, 2021, ch. 5, pp. 89-102.

5. Thesis or Dissertation

Format: [Ref. number] Initial(s). Surname, "Title of thesis," Degree thesis, Department, University, City, State (or Country), year.

Example:

[5] L. G. Kim, "Modeling of solar panel efficiency," M.S. thesis, Dept. Elect. Eng., Stanford Univ., Stanford, CA, USA, 2019.

6. Technical Report

Format: [Ref. number] Initial(s). Surname, "Title of report," Institution/Company, City, State (or Country), Rep. number, year.

Example:

[6] P. Q. Davis, "Performance evaluation of wind turbines," Nat. Renewable Energy Lab., Golden, CO, USA, Rep. NREL/TR-1234, 2023.

7. Website

Format: [Ref. number] Initial(s). Surname or Organization, "Title of webpage," Website Name. [Online]. Available: URL, accessed date.

Example:

[7] IEEE, "Guide to referencing," IEEE Xplore. [Online]. Available: <https://ieeexplore.ieee.org/guide>, accessed Mar. 23, 2025.

8. Patent

Format: [Ref. number] Initial(s). Surname, "Title of patent," Country Patent patent number, month day, year.

Example:

[8] H. R. Taylor, "Wireless communication device," U.S. Patent 7 654 321, Jan. 10, 2020.

9. Standard

Format: [Ref. number] Standard Number, *Title of Standard*, Publisher, year.

Example:

[9] IEEE Std 802.11, *Wireless LAN Medium Access Control*, IEEE, 2021.

10. Magazine Article

Format: [Ref. number] Initial(s). Surname, "Title of article," *Title of Magazine*, vol. volume, no. issue, pp. page range, month year.

Example:

[10] S. M. Clark, "The future of robotics," *IEEE Spectrum*, vol. 59, no. 3, pp. 34-39, Mar. 2023.

3.10. Additional guidelines

Several additional guidelines:

- **Multiple Authors:** List all authors as they appear in the source. For more than six authors, use "et al." after the first author's name.
Example: [11] J. K. Smith et al., "Battery efficiency analysis," *IEEE Trans. Power Syst.*, vol. 40, no. 1, pp. 15-22, Jan. 2024, doi: 10.1109/TPS.2023.3214567.
- **DOI:** Include the DOI for journal articles when available, formatted as "doi: 10.XXXX/..." (no period at the end). Use a stable URL only if no DOI exists.
- **Consistency:** Ensure each in-text citation matches its reference list entry. Reuse the same number for repeated citations of the same source.
- **Placement:** Position the reference list after the main text, before appendices, under the heading "References" (bold, left-aligned).
- **Formatting:** Use a hanging indent for each entry (first line flush left, subsequent lines indented) and single spacing within and between entries.

4. Conclusions

The conclusion section seeks to underscore the importance and relevance of your research for the reader. It weaves together the key findings into a clear synthesis, emphasizing their significance within the broader field. Instead of just recapping the content or repeating the research problem, this section should spotlight your study's contributions and reflect on how your results deepen or expand knowledge in the area. It should also explore potential implications or practical applications of your findings and, where relevant, point to directions for future research.

To ensure perfection, this section must be written in Palatino Linotype font, 10-point size, with single spacing. The first line of each paragraph should be indented by 0.5 cm (0.19 inches), and the text should maintain a clear, concise, and engaging tone throughout.

Declaration statement

Authors can see the list of contributors in Author Guidelines. Examples are: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review and editing.

Usage example:

Rocky Alfanz: Conceptualization, Methodology, Writing-Original Draft. **Romi Wiryadinata, Fragrans Anjasmara Sobar, Imamul Mutakkin:** Collecting data. Ipick Setiawan, Alif Maulana: Writing-Review & Editing.

Acknowledgement

In this section, the author expresses gratitude to all individuals and organizations that supported the research project. Acknowledge those who provided financial support, including grants and donations, as well as institutions and departments that facilitated the research. Additionally, recognize individuals who

contributed through their feedback, assistance with data collection, or help in drafting and revising the manuscript. This section serves to give credit to those who played a crucial role in the completion of the study.

Disclosure statement

The disclosure statement is a section where authors provide information about any potential conflicts of interest or financial relationships that could be perceived as influencing the research. This includes disclosing any financial support, funding sources, or personal relationships that might affect the objectivity of the research. The statement should ensure transparency and uphold the integrity of the research by revealing any factors that could potentially impact the study's findings or interpretation.

Example:

"The author declares that this manuscript is free from conflict of interest and is processed by applicable journal provisions and policies to avoid deviations from publication ethics in various forms."

"The authors declare no conflicts of interest."

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The funding statement acknowledges the financial support received for the research. It specifies the funding sources and grants that supported the study. This section is essential for transparency and provides context regarding the resources behind the research.

Examples:

"This research was funded by the National Science Foundation (NSF) under grant number 123456. The authors thank the NSF for their financial support, which made this study possible."

"This work was supported by the [Institutional Research Grant] from [University Name], grant number [Grant Number]. The authors would like to acknowledge the [University Name] for their generous support and resources."

"The study was funded by [Company Name], grant number [Grant Number]. The funding body had no role in the design of the study, data collection, analysis, or interpretation of the results."

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"The authors received no funding for this research."

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The data availability statement specifies where and how the data supporting the findings of the research can be accessed or provides information on the availability of the data. This statement is crucial for ensuring transparency and allowing other researchers to verify or build upon the study.

Examples:

"The authors confirm that the data supporting the findings of this study are available within the article or its supplementary materials."

"The data that support the findings of this study are available from the corresponding author upon reasonable request. Data are not publicly available due to [reason, e.g., privacy concerns]."

"All data generated or analyzed during this study are included in this published article and its supplementary information files. Additional data can be requested from the authors at [contact information]."

"The datasets used and/or analyzed during the current study are available in the [Name of Repository] repository, accessible at [repository URL]. For any additional data inquiries, please contact [corresponding author's email]."

"The data supporting the conclusions of this study are available in the [Data Repository Name] with the identifier [DOI or accession number]. The data are open access and can be freely accessed by interested parties."

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"The authors confirm that no generative AI or AI-assisted tools were used in the creation or writing of this manuscript. All content has been entirely produced, reviewed, and edited by the authors without the assistance of AI technologies."

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- [1] J. K. Smith, "Analysis of renewable energy systems," *IEEE Trans. Energy Convers.*, vol. 35, no. 2, pp. 123-130, Jun. 2022, doi: 10.1109/TEC.2022.3156789.
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- [3] R. T. Johnson, *Fundamentals of Electrical Engineering*, 2nd ed. New York, NY, USA: Wiley, 2020.
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Response form

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