Building a Strong Foundation: Techniques for Writing Effective Introduction and Literature Review

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(Presented by Chamnan Para)

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1. Introduction to Introduction and Literature Review (30 minutes)
• Explanation of what an introduction and literature review are
• Importance of a strong introduction and literature review in academic writing
• Overview of the key components of an introduction and literature review
2. Writing the Introduction (60 minutes)
• Discussing the purpose and structure of the introduction
• Providing examples of good introductions
• Guiding participants through the process of writing an introduction for their own research paper
3. Writing the Literature Review (90 minutes)
• Discussing the purpose and structure of the literature review
• Providing examples of good literature reviews
• Guiding participants through the process of writing a literature review for their own research paper
4. Conclusion and Next Steps (30 minutes)
• Recap of the key takeaways from the workshop
• Discussion of any remaining questions or concerns
• Suggestions for further reading or resources to help participants continue improving their writing skills

Introduction

Writing a good Introduction section for a research article is essential as it provides readers with the background information, context, and rationale for the study. Here are some tips for researchers to consider when writing an Introduction:

1. Provide context and background information: Start by providing the reader with background information and context for the study. This can include the research topic, why it is important, and any relevant historical or theoretical information.

2. State the research question or hypothesis: Clearly state the research question or hypothesis that the study aims to address. This will help readers understand the purpose of the study and what the researchers hope to achieve.

3. Explain the significance of the study: Highlight the significance of the study by explaining how it contributes to the field and why it is important. This can be done by discussing gaps in current knowledge or by explaining how the study builds on previous research.

4. Outline the approach and methods: Provide a brief overview of the approach and methods used in the study. This can include the research design, sample size, data collection and analysis methods, and any relevant statistical techniques.

5. Highlight key findings: While the Introduction section typically does not include any results, researchers can still highlight any key findings that will be discussed in the later sections of the article.

6. Keep it concise: The Introduction section should be concise, typically around 10% of the total article length. Avoid unnecessary jargon or technical language, and make sure the writing is clear and accessible to a broad audience.

Types of Introduction sections in research articles

There are generally three types of Introduction sections in research articles:

1. General Introduction: This type of Introduction provides a broad overview of the topic and establishes its significance and relevance to the field of study. It may introduce key concepts, theories, or methodologies related to the topic, and provide a context for the study.

2. Problem-Centered Introduction: This type of Introduction focuses on a specific problem or issue related to the topic, and explains how the study addresses that problem. It may highlight gaps in current knowledge or literature, and explain how the study contributes to filling those gaps.

3. Article-Specific Introduction: This type of Introduction is more common in longer articles or multi-part studies, where the Introduction section is broken down into subsections that introduce each part of the study. Each subsection may provide background information, state the research question or hypothesis, and explain the approach and methods used for that part of the study.

It is important for researchers to choose the type of Introduction section that is most appropriate for their study and research goals. They should also be aware of the journal's guidelines and formatting requirements, as these may influence the structure and content of the Introduction section.

Genres and Moves in the Introduction section of research article

The Introduction section of a research article typically follows a specific structure, which consists of several moves or steps that researchers use to effectively introduce their study to readers. These moves can vary slightly depending on the specific field or discipline, but they generally follow a similar pattern. Here are some common moves and genres that are typically found in the Introduction section of a research article:

1. Establishing the research area: The introduction often starts by establishing the general research area, and describing the importance and relevance of the research topic. This can be done by providing a general overview of the research area and identifying key research questions, problems or gaps in the literature.

2. Providing background information: Researchers often provide background information to help readers understand the context of the research. This can include historical or theoretical information, and may involve citing relevant literature or previous research.

3. Highlighting the research problem or question: Researchers will typically state the research question or problem that the study aims to address. This is often done towards the end of the introduction, and provides readers with a clear understanding of the purpose of the research.

4. Outlining the research design and methodology: Researchers may also outline the research design and methodology, providing details on the approach, methods, and data analysis techniques used in the study.

5. Previewing the key findings: Finally, researchers may provide a preview of the key findings of the study, which will be discussed in detail in subsequent sections of the article.

Overall, the Introduction section serves to establish the context and significance of the research, and to provide readers with a clear understanding of the purpose and objectives of the study. By following the above moves and genres, researchers can effectively introduce their research to readers and provide a strong foundation for the rest of the article.

Words and expressions that researchers may use in each move of the Introduction section:

1. **Establishing the research area:**

"In recent years, there has been growing interest in..."

"The topic of [research topic] has received increasing attention in [field/discipline]..."

"Given the importance of [research area], it is crucial to investigate..."

Providing background information:

"Previous studies have shown that..."

"Theoretical frameworks such as [theory] have been used to explain..."

"Historically, [research topic] has been an area of intense debate..."

2. **Highlighting the research problem or question:**

"The aim of this study is to investigate..."

"This research aims to address the following research questions..."

"The key research problem addressed in this study is..."

3. Outlining the research design and methodology:

"This study employs a [research design] approach, using [data collection methods] to collect data from [sample population]..."

"We used [methodology] to analyze the data and identify patterns and themes..."

"The study was conducted over a period of [timeframe], and involved [number] participants..."

4. Previewing the key findings:

"The results of this study suggest that..."

"Our findings indicate that [research question/problem] is influenced by..."

"This study provides important insights into the relationship between [variable 1] and [variable 2]..."

These are just a few examples of words and expressions that researchers might use in each move of the Introduction section. The specific language and terminology used will depend on the field or discipline, as well as the specific research topic and methodology being employed.

Editor's expectations

Editors expect researchers to provide a well-written and structured Introduction section in their manuscript, as it serves as the foundation for the rest of the article. Here are some expectations that editors may have for researchers regarding the Introduction section:

1. Clear research question or problem: Editors expect the Introduction to clearly state the research question or problem that the study aims to address. The research question or problem should be specific and focused and should be situated within the broader context of the research area.

2. Relevant background information: The Introduction should provide relevant background information to help readers understand the context of the study. This includes historical, theoretical, or empirical information that is important for understanding the research problem or question.

3. Significance and relevance of the study: Editors expect the Introduction to clearly establish the significance and relevance of the study to the field of research. The Introduction should explain why the study is important and what contribution it makes to the broader research area.

4. Clear and concise writing: Editors expect the Introduction to be written in clear and concise language that is easy for readers to understand. The Introduction should avoid using overly technical jargon or complex terminology that may confuse or alienate readers.

5. Appropriate structure and formatting: Editors expect the Introduction to follow an appropriate structure and formatting, which may vary depending on the specific journal or field. The Introduction should be well-organized, with clear headings and subheadings, and should follow the conventions of the specific field or discipline.

Overall, editors expect researchers to provide an Introduction section that effectively introduces their research to readers and establishes the significance and relevance of the study. By following the above expectations, researchers can ensure that their Introduction section is well-written, structured, and relevant to the broader research community.

The expectations of readers and audiences for the Introduction section

The expectations of readers and audiences for the Introduction section of a research article may vary depending on the specific field or discipline. Here are some general expectations that readers and audiences may have for the Introduction section in different fields:

Engineering: In the field of engineering, readers and audiences expect the Introduction to clearly identify the problem or need that the study aims to address, and to provide relevant background information to help readers understand the context of the study. The Introduction should also explain the methodology used to conduct the study, and should preview the key findings and their implications for the field of engineering.

Public Health: In the field of public health, readers and audiences expect the Introduction to clearly articulate the research question or problem that the study aims to address, and to provide a clear rationale for why the study is important and relevant to the field of public health. The Introduction should also provide relevant background information and a clear explanation of the methodology used, and should preview the key findings and their implications for public health practice.

Literature: In the field of literature, readers and audiences expect the Introduction to provide a clear and concise overview of the research topic, and to situate the study within the broader context of literary scholarship. The Introduction should also provide relevant background information, such as historical or cultural context, and should clearly articulate the research question or problem that the study aims to address.

Teaching: In the field of teaching, readers and audiences expect the Introduction to clearly articulate the research question or problem that the study aims to address, and to provide relevant background information on the topic of study. The Introduction should also provide a clear explanation of the methodology used, and should preview the key findings and their implications for teaching practice.

Science: In the field of science, readers and audiences expect the Introduction to provide a clear and concise overview of the research topic, and to situate the study within the broader context of scientific research. The Introduction should also provide relevant background information and a clear explanation of the methodology used, and should preview the key findings and their implications for the field of science.

Overall, readers and audiences in different fields expect the Introduction section of a research article to provide a clear and concise overview of the research topic, to situate the study within the broader context of the field, and to clearly articulate the research question or problem that the study aims to address. Additionally, readers and audiences expect the Introduction to be well-written, structured, and relevant to the broader research community.

Steps in writing up the Introduction

Step	Description
1	Start with a broad overview of the research topic or area, and provide some context for the study.
2	Narrow down the focus of the Introduction by identifying the research problem or question that the study aims to address. This should be a clear, specific, and focused statement that reflects the scope of the study.
3	Provide relevant background information that helps readers understand the context of the study. This may include historical, theoretical, or empirical information that is important for understanding the research problem or question.

Step	Description
4	Articulate the significance and relevance of the study to the broader research area. This may involve explaining why the study is important, what gap in the knowledge it fills, or what practical implications it has.
5	Preview the key findings of the study and their implications for the field. This may involve briefly summarizing the methodology used, and highlighting the most important or interesting results of the study.

It's worth noting that the specific details and emphasis of each step may vary depending on the field or discipline of the study. Nonetheless, these steps can serve as a general guide for writing a good Introduction section that effectively introduces the research to readers and establishes its significance and relevance.

Steps involved in writing the introduction of a research article

Step	Description
Step 1	Identify the research topic and research question(s)
Step 2	Conduct a literature review to identify relevant studies and gaps in the literature
Step 3	Develop a research hypothesis or thesis statement
Step 4	Provide background information and context for the study
Step 5	State the purpose and objectives of the study

Step	Description
Step 6	Describe the significance and potential impact of the study
Step 7	Provide an overview of the study design and methodology
Step 8	Outline the structure of the paper

Activity

Read the research article and analyze the organization or the researcher's writing

Source: https://www.sciencedirect.com/science/article/pii/S2590252022000198

Climate change adaptation cycle for pilot projects development in small municipalities: The northwestern Italian regions case study

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ABSTRACT

More than half of the European population live in small and medium size municipalities, where climate adaptation planning is an under-researched topic within the climate change field. Many constraints might hinder the implementation of adaptation pilot projects due to lack of economic, knowledge, and technical available resources. Local institutions find difficulties in building a coherent local adaptation planning and design processes with international and national frameworks. In this context, this article proposes a methodology based on the available international frameworks to support the small communities with the aim to implement adaptation pilot projects within different sectors. In doing so, this paper tests a climate change adaptation cycle for pilot projects development in small municipalities; the first in Italy for small municipalities under 20.000 inhabitants. The proposed methodology could lead local adaptation initiatives in climate change risk assessment by supporting the research communities in developing a coherent vision for the local territories and to identify proper oriented measures to enhance demonstrative pilot projects and to increase the level of resilience in small municipalities, avoiding maladaptation.

1. Introduction

Climate change impact is one of the key risks that can affect human society at the global level, and its effects vary significantly among different geographical areas and territorial scales [1]. By looking at human settlements, the exposure levels differ also in relation to the observed and expected local climate hazards, such as extreme temperatures and precipitation events, droughts occurrences, and sea level rise. In addition, the adaptive capacity, which entails preventive policies and measures at the local scale, can mitigate those risks. This is the reason why local municipalities are considered a key actor to develop adaptation policies and support local actions to increase the level of resilience [2]; Phil & Cohen, 2019; [3]). By looking at European territories, even if cities are one of the main hotspot of the climate change impacts due to a multiplicity of aspects, around 56 % of the population is located in a small or midsize town[4,5]. Small and medium-sized municipalities are equally affected by climate change with very specific associated challenges and, to date, they are not so well represented in the research such as cities and metropolitan areas[6,7] (see Fig. 1. As emerged by the state-of-art literature, small towns present relevant different challenges compared to large urban contexts. For instance, they usually have to deal with a lower availability of climate data and information, scarce financial resources to implement adaptation measures and to develop technical and professional skills and a lack of governmental structures to additionally integrate climate change adaptation into their administrative practices[2,8–14]. In the Bavaria region (Germany), Bausch et al. [8]analyzed the implementation of mitigation and adaptation measures in small municipalities, and have identified significant gaps between theoretical discussion, local policies and concrete measures on the ground in the majority of small municipalities. Studies on small and medium municipalities present exceptions that have focused in particular on developing countries and the effects of climate change such as

STUDY AREAS

Aosta Valley   Piedmont   Liguria

WINNING PROJECTS

1 **Brozolo //**
Il lago e il bosco: la rinascita
2 **Valle del Gran San Bernardo //**
COUMBA ELEMENTS
3 **Acqui Terme //**
Gli alberi e la città
4 **Alagna Valsesia, Gressoney - La - Trinitè //**
RigeneRosa
5 **Almese //**
ARCA
6 **Avigliana //**
ACQUA: risorse da gestire
7 **Cavour, Saluzzo //**
FruttADA
8 **Viarigi //**
Accordo di Viarigi
9 **Landiona, Mandello Vitta, Recetto, San Nazzaro Sesia //**
AdattaMENTI
10 **Cairo Montenotte //**
Percorsi e monitoraggio AIB per la Riserva dell'Adelasia
11 **Oulx //**
VAZON DURABLE
12 **Unione Montana Val Tanaro //**
ANTS - Azioni di Network per un Territorio Sicuro

Fig. 2. The winner projects of the Call "Mutamenti".

sea level rise, flooding and landslides[2,10,15,16]. In addition, another exception focus on the possibility to develop climate change adaptation networks to exchange information and support the local communities [17].

Since 2015, in Europe, the main initiatives to support small municipalities in climate adaptation planning processes have been based on voluntary adhesion. Among others, Mayors Adapt integrated mitigation actions with climate risk assessments (i.e., adaptation defining a transition from Sustainable Energy Action Plan to Sustainable Energy and Climate Action Plan (SECAP).

Therefore, in accordance with the highlights mentioned above, the research question is the following: which is the best strategy to support small European municipalities to cover technical and implementation issues related to climate change adaptation pilot projects development?

According to this question, this paper explained a applied hybrid methodology (i.e., quantitative and qualitative approach), which could support local governments and stakeholders - within 12 small municipalities (with population under 20,000 inhabitants) in Piedmont, Valle D'Aosta and the Ligurian hinterland (northwest of Italy). This heterogeneous sample of case studies was identified to promote the northwest territories in Italy, as a laboratory to experiment a climate change adaptation cycle for local development in small municipalities. This with the aim to overcome technical and knowledge gaps in developing climate change adaptation pilot projects.

In doing so, the paper is organized as follows. Section 2 is oriented towards the contextualization of the case studies under consideration. And, while Section 3 describes in detail the theoretical framework and the applied methodology, Section 4 explores the obtained outcomes of each applied step and explores the capacity to address the main challenges involved in the adaptation processes at the local scale.

2. The case study: Call "Mutamenti"

In recent years, foundations are playing a key role to support local, environmental and sustainable projects[18]. In this context, Compagnia di San Paolo Foundation (CSP) isa foundation located in the North West of Italy and, in the last years, it has developed several initiatives to promote the cultural, economic and environmental local development. In 2021, the CSP, in collaboration with the Foundation Euro Mediterranean Center on Climate Change Foundation (CMCC), launched the Call for Ideas "Mutamenti", to promote and increase the resilience to the impacts of climate change over Piedmont, Valle D'Aosta and the Ligurian hinterland. In particular, the objectives of the Call were the following: (i) to foster a better understanding of observed and future climate change phenomenon; (ii); to increase awareness of the impacts of climate change based on data and risk assessment and management; (iii) to disseminate framework of global, European and national strategic policies on adaptation, and on the project funding opportunities arising from these policies; (iv) to encourage territories in the design of adaptation actions at the local level; and (v) to support the design and the implementation of specific adaptation measures in relation to each of the projects involved in the first and in the second phase of the call "Mutamenti".

1. Introduction

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With this initiative, CSP addressed the issue of climate change with an experimental approach aimed at local adaptation design initiatives, developed through community and territorial partnership. The pilot selection criteria of the "Mutamenti" Call were based on the territories description,clarity in submitted paperwork, the consistency of the project with the objectives of the Call, the potential effectiveness of the climate adaptation proposal; the adequacy and quality of the design community engagement strategy; and, finally, on the basis of financial criteria. Overall, 12 projects were shortlisted out of a total of 41 among Aosta Valley, Piedmont, and Ligura territories. The selected projects relate to different entities, such as municipalities, NGO local associations, union of municipalities and provinces, (Fig. 2 for more details). To provide a greater understanding of the characteristics pertaining to the projects, Table 1 explains the proposing entities, the location, the number of inhabitants, and the detailed description of each project. Given their geographical location, the identified territories in Piedmont, Liguria and Aosta Valley are subjected to different climate hazards which cause relevant impacts on different strategic sectors, such as on residents, infrastructures, agricultural activities, tourism, and on natural resources [19]

This introduction is organized as follows:

The first paragraph provides an overview of the impact of climate change on human society and its variation among different geographical areas and territorial scales. It also highlights the importance of local municipalities in developing adaptation policies and supporting local actions to increase resilience.

The second paragraph focuses on small and medium-sized municipalities in Europe and the specific challenges they face in adapting to climate change, such as limited availability of climate data and information, scarce financial resources, and a lack of governmental structures.

The third paragraph highlights some exceptions in the research on small and medium municipalities, including those focused on developing countries and the effects of climate change, as well as the possibility of developing climate change adaptation networks.

The fourth paragraph introduces the research question: "Which is the best strategy to support small European municipalities to cover technical and implementation issues related to climate change adaptation pilot projects development?"

The fifth paragraph provides an overview of the applied hybrid methodology (i.e., quantitative and qualitative approach) that could support local governments and stakeholders within 12 small municipalities in Piedmont, Valle D'Aosta, and the Ligurian hinterland in northwestern Italy. The aim is to overcome technical and knowledge gaps in developing climate change adaptation pilot projects.

The sixth paragraph introduces the case study of the "Mutamenti" Call, launched by the Compagnia di San Paolo Foundation in collaboration with the Foundation Euro Mediterranean Center on Climate Change Foundation (CMCC) to promote and increase resilience to the

impacts of climate change over Piedmont, Valle D'Aosta, and the Ligurian hinterland. The objectives of the Call are listed, and the selection criteria for the pilot projects are explained.

The final paragraph summarizes the overall organization of the paper, with Section 2 providing the contextualization of the case studies, Section 3 describing the theoretical framework and applied methodology, and Section 4 exploring the outcomes of each applied step and the capacity to address the main challenges involved in the adaptation processes at the local scale.

There are three main moves in this introduction:

Move 1: Introduction and background information on climate change impact, its effects on human society, and the role of local municipalities in developing adaptation policies (Paragraph 1)

Move 2: Discussion of the challenges faced by small and medium-sized municipalities in adapting to climate change and their underrepresentation in research (Paragraph 2)

Move 3: Overview of existing research on small towns and their challenges in adapting to climate change, with examples (Paragraph 3)

Move 4: Explanation of the research question and the methodology used to address it (Paragraph 4)

Move 5: Description of the case study, including the Call for Ideas "Mutamenti" and the selection criteria for pilot projects (Paragraphs 5 and 6)

Move 6: Discussion of the outcomes of the applied methodology and the capacity to address challenges involved in adaptation processes at the local scale (Paragraph 7)

Literature Review

In research articles, the literature review can be written separately or merged with the introduction section depending on the style and format of the article. In some academic fields, the literature review is written as a separate section after the introduction, while in others, it is included as a part of the introduction.

The decision of whether to merge the literature review with the introduction or to keep it as a separate section may depend on the nature of the research, the preferences of the journal or academic field, and the author's writing style. However, it is important to ensure that the literature review provides a comprehensive and critical analysis of the existing literature related to the research topic, regardless of where it is placed within the research article.

A good literature review should have the following characteristics:

1. Clearly defined scope: The literature review should clearly define the scope of the research question and only include studies and sources relevant to that question.

2. Comprehensive search: The literature review should use a comprehensive search strategy to identify all relevant studies and sources.

3. Critical evaluation: The literature review should critically evaluate the quality and reliability of the studies and sources included, highlighting any limitations or gaps in the research.

4. Organized structure: The literature review should be well-organized, with a clear structure that follows a logical progression of ideas.

5. Synthesis of findings: The literature review should synthesize the findings of the studies and sources included, identifying patterns, trends, and gaps in the research.

6. Clear and concise writing: The literature review should be written in clear and concise language, avoiding jargon and technical terms wherever possible.

7. Proper citation and referencing: The literature review should provide proper citation and referencing of all sources used, following the appropriate style guide.

Journal editors expect a literature review to be a comprehensive and critical summary of the existing research in a particular area. They expect the review to be up-to-date and to cover the most relevant and significant research that has been conducted in the field. The literature review should also provide a clear and logical framework for the research that the paper is presenting.

Moreover, journal editors expect literature reviews to demonstrate the author's knowledge and understanding of the relevant literature, and to present a well-structured and well-argued analysis of the existing research. The review should identify any gaps in the existing research and suggest areas where further research is needed.

In addition, journal editors expect literature reviews to be written in a clear, concise, and engaging style, with an appropriate level of detail and a focus on the most important aspects of the research. They expect the review to be free of errors and to adhere to the journal's guidelines for formatting, referencing, and citation style.

Types of Literature Review sections in research articles

There are several types of literature review sections that can be included in a research article, depending on the specific focus and scope of the study. Here are some common types:

1. Narrative literature review: This type of review provides a summary and critical analysis of the existing literature on a topic, without using a formal systematic approach to identifying and selecting studies.

2. Systematic literature review: This type of review uses a structured approach to identify, select, and critically appraise relevant studies on a specific topic, with the aim of providing a comprehensive and unbiased summary of the available evidence.

3. Meta-analysis: This is a quantitative method for synthesizing the results of multiple studies on a particular topic, using statistical techniques to combine the findings and provide a summary estimate of the effect size.

4. Scoping review: This type of review provides a broad overview of the literature on a topic, with the aim of identifying key concepts, themes, and research gaps, rather than providing a detailed analysis of individual studies.

5. Cochrane review: This is a type of systematic review that focuses on evaluating the effectiveness of healthcare interventions, using a rigorous and transparent methodology to identify and analyze relevant studies.

6. Rapid review: This is a streamlined and abbreviated form of systematic review that aims to provide a timely summary of the literature on a topic, using a truncated search and selection process and a simplified approach to data analysis.

7. The specific type of literature review used in a research article will depend on the research question, methodology, and objectives of the study, as well as the requirements and preferences of the target journal or audience.

Genres and Moves in the Literature Review section of research articles

The Literature Review section of a research article typically includes the following genres and moves:

Introduction: This introduces the topic and provides context for the literature review. It may include a brief summary of the research question or problem being addressed.

Overview of the field: This provides a broad overview of the field of study and the key concepts, theories, and debates relevant to the research question.

Historical background: This provides a historical overview of the topic, including important developments and changes over time.

Theoretical framework: This outlines the theoretical framework or frameworks used to guide the study, including key concepts, assumptions, and definitions.

Conceptual framework: This presents a conceptual framework for the study, including key variables, relationships, and hypotheses.

Methodology: This discusses the research methodology used to conduct the literature review, including search strategies, inclusion/exclusion criteria, and quality assessment.

Synthesis and analysis: This synthesizes and analyzes the findings of the literature review, including common themes, patterns, and gaps in the literature.

Implications and conclusions: This discusses the implications of the literature review for the research question, including potential directions for future research, and provides a conclusion for the literature review section.

Words and expressions that researchers may use in each move of the Literature Review section:

Here are some examples of words and expressions that researchers may use in each move of the Literature Review section:

Establishing the research territory:
The topic under investigation is...
Previous research has shown...
There is a growing interest in...
This area of study is important because...
The purpose of this study is to...
Establishing the significance of the research:
This study is significant because...
The findings of this study will contribute to...
This research will address a gap in the literature on...
The results of this study will have implications for...
Identifying gaps in the literature:
However, few studies have examined...
Despite the abundance of research on X, little is known about...
There is a lack of research on...

There is a need to further investigate...

Establishing the need for the current study:

Therefore, this study aims to...

Given the gaps in the literature, this study will...

This study will build on previous research by...

The current study will address the following research question...

Providing an overview of the literature:

Several studies have investigated...

Research in this area has focused on...

A number of studies have explored...

Previous research has identified...

The literature suggests that...

Summarizing and synthesizing the literature:

Overall, the literature suggests that...

The consensus in the literature is...

A common finding in the literature is...

The literature indicates that...

Collectively, the studies reviewed suggest that...

Critiquing the literature:

However, some studies have been criticized for...
Other studies have reported conflicting findings...
One limitation of the existing research is...
A potential weakness of the literature is...
Despite the strengths of previous studies, there are some limitations to consider...
Identifying areas for future research:
Further research is needed to...
Future studies could examine...
One area for future research is...
An interesting avenue for future research would be to...
The current study provides a foundation for future research on...

Steps involved in writing the Literature Review of a research articles

Step	Description
1	Choose a topic and narrow down the scope of the literature review
2	Identify relevant databases and conduct a comprehensive search for literature using appropriate keywords

Step	Description
3	Evaluate the quality and relevance of the literature found, and select the most relevant studies to include in the review
4	Synthesize and organize the literature, identifying common themes and areas of disagreement or controversy
5	Write the literature review, including an introduction, body paragraphs organized by themes, and a conclusion summarizing the findings and highlighting areas for further research
6	Revise and edit the literature review for clarity, coherence, and accuracy
7	Properly cite all sources used in the literature review, adhering to the citation style guidelines specified by the journal or publisher

Pen and paper or computerized notetaking? L2 English students' views and habits☆

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ARTICLE INFO

ABSTRACT

Many students have the option of taking notes using the traditional pen and paper method or using computers to take notes digitally. Decisions about which notetaking method to use can be particularly important for students operating in a second language (L2), as they often face challenges in listening comprehension and note production in comparison to working in their first language (L1). While empirical research has begun to investigate which notetaking method might be more beneficial in terms of note content and lecture comprehension, less is known about how preference for pen and paper or computerized notetaking may affect views of notetaking and notetaking habits. Therefore, this paper builds on previous survey studies on student notetaking by comparing responses from those who prefer taking notes with pen and paper with those who prefer computerized notetaking. In addition, while much research has focused on students listening to content and taking notes in their L1, participants in this study were doing so in English as an L2. Data from 385 participants across four countries was collected via an online survey, and 2×2 chi squared tests of independence were used to determine any differences between those who prefer pen and paper and those who prefer computerized notetaking in relation to statements about and habits related to notetaking. Results showed more differences in opinions, in particular related to feelings about comprehension and concentration levels, and more consistency in notetaking habits. Implications are discussed in relation to levels of processing and encoding theories as well as to previous research.

1. Introduction and background

Notetaking is a common part of academic life, particularly in secondary and tertiary education, where students are met with increasing amounts of information that they must remember, learn and use. From a traditional standpoint, notetaking can be viewed as recording information by hand on paper using the pen and paper method (P&P). Availability of laptop and tablet computers has provided students with additional options for notetaking, and the P&P method is no longer the only one in use. This paper does not propose to definitely claim that one method is superior to the other. Each of these methods

has advantages and disadvantages, some of which have been discussed in relation to roles each can play in the recording of information in notes and their later use.

While options for digital notetaking are on the rise, many students still prefer the traditional pen and paper method (P&P). They may do so for a variety of reasons, including that they believe the physical act of writing helps them remember information or that they find digital methods lacking in terms of flexibility or functionality. On the other hand, computerized notetaking (CN) can provide benefits in terms of typing versus writing speed as well as more secure digital storage options. Apart from these assumed pros and cons, the ways in which preference for one notetaking method over another may influence, or at least reveal, particular viewpoints about and habits related to notetaking. While empirical studies from L1 English contexts have pitted methods (e.g., by hand, laptops, and sometimes e-Writers) against each other in terms of note content, comprehension tests, and final course grades (e.g., [11,37,38,41,55]), method preference is an area of educational psychology research that has yet to be fully explored. It is also important to note that, as technology develops, more hybrid options for digital notetaking are becoming available (e.g., laptops that allow for use of touchscreens and digital pens); however, for the purposes of the present paper, CN is conceptualized as typing on a keyboard and utilizing functions available in common word processing software (e.g., Microsoft Word, Pages, etc.).

This paper takes the P & P and CN debate and collected data from a new population: L2 English students studying on English for academic purposes (EAP) courses. Therefore, the study and its findings should be viewed in light of L2 proficiency and development. Listening has been identified as one of the most challenging L2 skills to acquire, and L2 listeners must become adept at using both bottom-up listening skills to decode incoming input and applying top-down strategies (e.g., making predictions, guessing content, applying background knowledge) while listening (e.g., [7,19,51]). Whereas listening in the L1 develops naturally through ample amounts of exposure and interaction (e.g., [36]), L2 listeners, particularly in academic contexts where notetaking may be expected, face challenges including rapid rates of speech, unknown terminology, unfamiliar accents, and

new cultural references (e.g., [20,53,56]). They must also be able to process multimodal paths of information delivery [44]. Further, while listening ability is needed to initiate the notetaking process, L2 production skills (e.g., writing, typing, spelling, etc.) are needed to take notes and L2 reading ability is required to access the content of notes later. Notetaking is, after all, an integrated skill, meaning that notetakers need ample levels of cognitive and motor skills while operating in the L2. Because of these challenges, notetakers may find it easier to listen to and take notes in their L1 and may face myriad obstacles when doing so in an L2.The majority of studies comparing notetaking methods have done so based on notes taken during specific instances and with assigned methods rather than examining student perspectives on the issue more generally. As such, there is value in taking a more introspective and personalized line of inquiry into the distinctions between preference for P&P or CN notetaking as well as exploring student perspectives as L2 users. To further understand the relation between preference for notetaking method and learning experiences, the following survey study aimed to address the following research questions:

1.

Does preference for P&P or CN indicate any differences in L2 English students' views of notetaking?

2.

Does preference for P&P or CN indicate any differences in L2 English students' habits while or after notetaking?

By understanding students' views and habits related to notetaking, these findings can be factored into teaching as well as academic development and study skills support, all of which likely need special consideration when an L2 is involved. As the present research deals with students who are studying via L2 English, issues such as comprehension, comfort, and learning, all facilitated by notetaking in different ways, are crucial to investigate.

1.1. On notes and notetaking

Notes are basically "short condensations of a source material that are generated by writing [or typing]...while simultaneously listening..." ([49], p. 292). This definition includes three key elements that help in the conceptualization of notes and notetaking adopted for this paper, and they are applicable to notes taken by hand and digitally. First, regardless of the language of input or the language in which notes are being taken, notes represent a shorter expression than their source text (e.g., [45]). By creating this truncated version of the source text, the listener must make decisions about what to prioritize by recording in notes and what might be perceived as extraneous or non-essential information that was included in the original text but omitted from notes (e.g., [2]).

Secondly, this definition also emphasizes that notes are "generated" in that it is the listener who needs to produce some language in the form of notes. This process of generation can be at a very basic level of verbatim copying, which involves only mechanical transfer of audio/visual information into written form, or at a much more complicated level involving paraphrasing, abbreviating, and putting personal interpretations on the incoming information (e.g., [60]). As Mueller and Oppenheimer [41] observe, the former is nongenerative in the sense that the listener is not creating anything new but instead only repeating what they have heard, while the latter involves the notetaker actively listening, processing content [12], and then selecting new ways to express in writing information they have heard or are hearing (e.g., [2]).

Thirdly, this paper focuses on notetaking while listening. As opposed to taking notes while reading, in which the notetaker can read at their own pace, re-read sections, write in margins, highlight or underline text, etc., when taking notes while listening, the notetaker typically does not have an entire written text to refer to. Instead, they must create a representation of what they hear and only then can they go about annotating that with symbols, underlining, etc.

From a theoretical point of view, the act of taking notes helps to offset and relieve stress on memory (e.g., [8]). Notetaking can aid learning through the encoding of information (i.e.,

the encoding effect) and by creating a repository of information for later use (i.e., the storage effect) [15]. By recording a piece of information in notes, the listener does not need to expend cognitive energy continuing to hold that piece of information in their mind. Instead, a written record of it has been created [15]; thus, the listener can focus energy on comprehending the incoming input, integrating the new information with their background and subject knowledge (e.g., [9]) and in to their notes, if desired. Later, they can go back to their notes and be reminded of what they have recorded. In this sense, notetaking reduces cognitive load and frees up mental energy to comprehend and consider the incoming speech [54]. Cognitive load refers to the notion that cognitive capacity has limits, and notetaking while simultaneously listening to lecture content likely challenges that capacity, leading to overload (e.g., [54]). When notetaking includes paraphrasing and expressing ideas in the listener's (as opposed to the speaker's) own words, the listener demonstrates a deeper level of cognitive processing than if they simply repeated the speaker's words (e.g., per Craik & Lockhart's [12] levels of processing theory). The ways in which these two theories might be influenced by preference for P&P or CN will be considered later in light of the study's findings.

1.2. On pen and paper and computerized notetaking

Regardless of whether P&P or CN is used, a similar coordination of cognitive and physical operations takes place. Some of these processes are the same when operating in one's L1 or L2; however, receptive and productive operations in an L2 likely involve stark challenges, depending on proficiency level, in comparison with one's L1. Listeners must initially listen and comprehend input. They then need to mentally prioritize the information they hear, distinguishing between key information that they believe should be noted down and other, less relevant things the speaker might say (e.g., asides, anecdotes, jokes) (e.g., [24,59]). Once the listener has selected an item to record in notes, they make several decisions related to: when, where, and how to take notes (e.g., [2,16]). The first decision relates to when is a good or appropriate time to take notes, such as when the speaker pauses or departs from the main gist. The second decision involves deciding where to record notes, a decision

markedly different between P&P and CN. With P&P, the writer can quickly move to any part of the paper simply by moving their hand and writing utensil to that part (e.g., the bottom of the paper, the left margin, etc.). Digital notetakers, particularly those using laptops, must drag the cursor to the desired position, as long as typing in that location is permitted by the word processing program in use (e.g., [18]).

A third decision, how to record, is also impacted by the method of notetaking. At this stage, notetakers choose between writing notes verbatim, paraphrasing, using abbreviations, drawing illustrations, making symbols, underlining, highlighting, etc. These are examples of semiotic meaning making, which involves various modes of communication (e.g., spoken and written language, symbols, images, and colors) (e.g., [14]), illustrating students' purposeful and motivated sign-making that are guided by their interests within the specific context and for which they employ available semiotic resources [29,30]. P&P notetakers make all of their "how" decisions in their mind and can immediately put them into operation on the paper. In other words, the writing utensil is flexible in that it can perform any of these actions with little to no preparation time (e.g., [47]). The notetaker makes the decision and immediately carries it out. With computerized notetaking drawing illustrations and making symbols, for instance, may involve a slightly slower process, as the digital notetaker may need to switch settings, locate certain buttons, drag the cursor to select certain functions, etc. These actions can, in theory, potentially slow the notetaking process and/or distract from continuously processing the incoming input (see below for further discussion of pros and cons of P&P and CN). With CN, the "how" to take must be integrated with the "how" to use a laptop to do so. All of these operations happen in near-simultaneous succession and under time pressure (e.g., [49]), as the listener needs to also attend to the incoming speech.

In the past, students in educational contexts had limited options when it came to notetaking. Thus, the P&P method is well-established as common practice in academic settings and notetaking instructional manuals and materials are typically geared toward this general method. Specific systems of notetaking within the P&P tradition have also emerged, such as

the Cornell method [45], the familiar outline method (e.g., [2,23]), or the graphic organizer (e.g., [11]). Then the proliferation of laptop computers came about. Laptops became cheaper, more readily available, and more convenient tools for learning and teaching. They became more common in classrooms, where students would use them for a range of tasks, notetaking among them. These new digital tools began to challenge the long-held prominence of P&P notetaking in classrooms, and technological strides are being made to combine analog and digital methods, such as use of a digital pen or stylus on a tablet or laptop screen (e.g., [43]).

As computers became more commonplace in classrooms and lecture halls, certain issues began to arise, especially in relation to learning in general and notetaking in particular. For instance, Korn [28] chronicles the struggles college students in the US have when their lecturers ban laptops from lecture halls. Teachers may be doing so for a variety of reasons, including: a) uncertainties about student attention (e.g., are they surfing the net or focusing on lecture content?); b) a lack of eye contact and facial expressions (e.g., valuable non-verbal feedback that the teacher can use to inform their teaching and delivery of material); c) the sound of student punching keys; and/or d) the distractive capacities of digital screens [52,55], not only to the individual with the computer but to others sitting in the vicinity as well.

Some teachers, according to Korn [28], are free to set their own policies on laptop use in their classrooms and choose to ban them. This practice, while likely with good intentions based on instructional experiences and beliefs about learning, may be viewed negatively, at least by some. Students, particularly those who have become accustomed to CN and who have left P&P in the past, face challenges related to muscular endurance when writing (e.g., hand cramps, fatigue), legibility of handwriting, and an inability to decipher later abbreviations and paraphrases they made during the notetaking act [28]. As such, students have expressed complaints about rules limiting the use of laptops for notetaking, emphasizing that such policies limit their capacity for learning [28].

Despite this controversy, each notetaking method (i.e., P&P and CN) arguably brings with it benefits and drawbacks (e.g., [1]). P&P is familiar and flexible in that students can quickly change note location and format, go back and add to previously taken notes, etc. A personal element also exists, as each person has unique handwriting and preferences for strategies like drawing pictures, indenting, and marking important items (e.g., underlining, starring, etc.) (e.g., [60]; [50]). Fatigue and unreadable handwriting (e.g., [3]), along with losing notes, are potential drawbacks of P&P. Meanwhile, convenience and speed are viewed as benefits of CN, with some students reporting that they can capture more information with digital options (e.g., [17]). The laptop can be an attractive option, as one can have multiple functions open at the same time (e.g., a PDF of a pre-lecture reading, a web browser to check links the teacher refers to, and a Microsoft Word document in which to take notes). When one's typing speed and accuracy are adequate, effective and efficient notetaking can take place (e.g., [4]). Storage is another advantage of the laptop, especially with cloud computing options, which can eliminate situations where a student needs to keep track of multiple loose sheets of notepaper that can become disorganized.

However, CN can also negatively affect learning via distraction for notetakers and/or for students sitting near them, or both (e.g., [5,22,25]). As expressed by Voyer, et al.'s [55] metaanalysis of notetaking research, the distractive capacity of digital tools for notetaking at least partially explains apparent advantages of notetaking by hand. Digitalization can also cause a disruption in learning; for example, one interviewee in Emory, et al. [17] reported feeling dissatisfied with learning and disconnected from the course content when taking notes on a computer in contrast to using the P&P method (p. 240).

Further, the temptation to type verbatim what a speaker says may lead to less retention and learning of information than paraphrasing and/or taking notes by hand (e.g., [41]). Laptop options may be more constrained than the flexibility of a pen and paper in the sense that, generally speaking, the laptop notetaker is limited to the default functions of the keyboard and the word processing software they use: typing from right to left, top to bottom,

alphabetical and numerical characters only (unless one goes to the special "insert symbol" drop-down menu), etc. Font options also lack the personalized nature of a person's own handwriting. In sum, CN options may be limited in comparison to P&P [1], where one can easily utilize any part of the paper, write in any direction or organizational structure (e.g., [2]), choose to draw a picture or symbol instead of using letters (e.g., [13,57]), and make such decisions in a split second. Thus, those students who prefer CN to P&P most likely do so because of the convenience and speed factors.

1.3. Previous empirical research on notetaking methods in L1 contexts

The following paragraphs provide an overview of research on notetaking methods in L1 contexts. Given the visibility of laptop notetaking in the classroom and the impacts it can have on both institutional policies and the learning experience, several recent studies have aimed to determine whether P&P or CN leads to better quality notes and learning. One early study was conducted by Mueller and Oppenheimer [41], who compared P&P and CN among first language (L1) English college students. The study involved students taking notes while listening to TED Talks. Whereas the CN had more words in their notes, the P&P group scored better on some comprehension questions. This difference was ascribed to the digital notetakers' tendency to transcribe verbatim what the speaker said rather than manipulate and paraphrase the content, a practice theorized to improve depth of processing and recall [12]. The authors point out that processing information and expressing content in the notetaker's own words is likely more effective than a transcription approach, which can be implicitly promoted by the typing speed offered by digital notetaking. In other words, the laptop notetakers experienced "shallower processing" ([41], p. 1159).

In a replication and extension study, Morehead, Dunlosky and Rawson [39] failed to replicate the initial findings reported by Mueller and Oppenheimer [41]. Their research, conducted using the same TED Talks as in the original project, found that whether students took notes by hand or with a laptop had no significant impact on comprehension questions answered immediately after the notetaking. Additional findings showed that the quantity of words in notes was greater for the CN than the P&P group, adding support for the notion

that laptop notetaking generates more words due to faster typing than handwriting speed. Luo, et al. [38] also compared P&P and CN and found that the latter recorded more notes (measured by "information units" (IUs) and words) and more verbatim portions of the lecture than their P&P counterparts. The P&P group, however, recorded more visual images in their notes than the digital group.

In a later study, Artz, et al. [4] showed that CN does not disadvantage learners compared to P&P and that the effectiveness of notetaking regardless of method likely depends on individual learner characteristics more than notetaking method. Colliot and colleagues [61] investigated the results of different levels of note support along with notetaking method. In their study, groups of students received notetaking support in the form of graphic organizers at three levels of completeness: complete, partial or no organizer. These formats were then used to take notes with either P&P or CN while students listened to and watched PowerPoint-based computer-based lessons. Tests showed that those with complete graphic organizers performed better on a range of test items, while notetaking method did not play a significant role in performance.

Given these conflicting findings related to technology and notetaking, Morehead, et al. [40] argue that "the available evidence does not provide a definitive answer to [the question of whether longhand or digital notetaking is preferable]" (p. 773). There is currently no definitive evidence as to which method yields better notetaking results for those operating in L1 English contexts. For example, when Emory et al. [17] examined correlations between notetaking method and GPA, they found that notetaking method does not have an impact on academic performance. Similarly, Lorio, et al. [37] found no significant differences between notetaking method and course grades. The apparent lack of impact of notetaking method is further evidenced by Voyer et al. [55], whose metaanalysis of 77 effect sizes reported in 36 articles on notetaking research suggest no effect of notetaking method (i.e., P&P or CN) on performance outcomes. While such issues have been explored in L1 contexts, they have not been investigated in relation to L2 users; therefore, it remains unclear whether language of instruction impacts notetaking strategies.

Studies like the ones mentioned above focus on notetaking performance under set conditions (e.g., use of P&P or CN while listening to a specific text(s)). Furthermore, the data analysis centers on quantitative measurements of note content (e.g., total words, information units, etc.) and/or outcomes on comprehension tests. In other words, such research captures snapshots of notetaking performance at specific times; however, they tell us little from the notetaker's perspective about their preferences for one method or another and how that preference may influence views or habits related to notetaking more generally. Moreover, the studies are set in L1 contexts and do not account for the complexities of listening to and taking notes in an L2.

1.4. Previous survey research on notetaking preferences among L1 and L2 students

A number of studies have investigated L1 students' views on and habits related to notetaking, but do not always account for the important distinction in terms of preference for P&P or CN. In one recent large-scale study, Morehead, Dunlosky, Rawson, Blasiman and Benjamin Hollis [39] surveyed L1 English students ($N = 577$) at one university in the US about notetaking habits in classroom lectures. Among other interesting findings, their data demonstrated that notetaking remains a crucial part of academic learning, with 96% of respondents stating that they take notes. P&P notetaking in a notebook was the most commonly reported method (86%), with laptop notetaking the second most common at 46%. These two methods are clearly the most preferred, with some students presumably using one or the other method at different times, or blending the two methods. Emory et al.'s [17] survey of 217 L1 English students showed that nearly 70% preferred laptop notetaking, suggesting an increase in use of this option over time. Only 1% ($n = 7$) on Morehead et al.'s [40] survey reported using tablets for notetaking, indicating that this digital method has not yet caught on to the extent that laptop notetaking has despite the increasing availability of hybrid and digital pen options. One valuable feature of this survey is a comparison with previous research from the 20th and 21st centuries, which shows a gradual increase in laptop notetaking (as would be logically expected) as well as a slight but noticeable reduction in notetaking by hand from 100% in 20th century reports to between

97%-50% in studies early in the 21st century to 86% on the 2019 survey these researchers conducted ([40], p. 812).

A recent survey of L2 English users preparing to study in English at university (N = 486) showed that around three quarters of respondents prefer P&P notetaking and that a similar percentage believe P&P to be more efficient than digital notetaking ([2], p. 54). Meanwhile, 13% reported that they prefer digital methods (either a laptop or tablet), but nearly a quarter (24%) believe digital methods to be more efficient for notetaking than P&P. A similar survey conducted by Kusumoto [33] compared L2 English user data from Japan and Sweden in order to understand the extent to which students in these two educational contexts had similar or differing notetaking habits. Analysis of survey responses showed some statistically significant differences between the two populations, including the difficulty of taking notes in one's L1, understanding the purpose for taking notes, and the value of notetaking to aid concentration. In terms of method for notetaking, a significant result showed digital notetaking much more common among L2 English user students in Sweden than those in Japan; however, Japanese students were much more likely to use mobile phones to photograph information in lectures than students in Sweden.

Survey studies such as those mentioned in this section provide useful insights into the notetaking habits and perspectives of the respective populations they investigated. They help present to the field common views and typical behaviors, which provide a general overview for the current state of notetaking. However, none of these studies have intensified analysis to determine whether preference for P&P or CN methods may influence views about and habits related to notetaking. Such an extended analysis would provide further insights into the potential distinctions of these two L2 English user groups of notetakers in practice, particularly in light of the growing body of empirical investigations on the topic. If students' respective views and habits could be determined with more precision, they could be better accounted for in the classroom.

The writing steps of the literature review can be extracted as follows:

The first section discusses the concept of notes and notetaking, emphasizing that notes are shorter expressions of the source text generated by the listener and focusing on notetaking while listening. The theoretical benefits of notetaking, such as reducing cognitive load and aiding learning, are also discussed.

The second section discusses the cognitive and physical processes involved in notetaking, regardless of the method used, and how listeners prioritize and decide what to record. The decisions related to when, where, and how to take notes are also discussed, and the differences between P&P and CN notetaking are highlighted. Semiotic meaning making, involving various modes of communication, is also discussed.

Moves in this Literature Review

Move 1: Introduction and theoretical background on notetaking

includes sub-sections 1.1 and 1.2

Move 2: Empirical considerations and research questions

includes sub-sections 2.1, 2.2, and 2.3

It is possible to further divide the sub-sections into smaller moves, but this would depend on the level of granularity and organization preferred by the reader or the writer.

In some research articles, the Introduction and Literature Review sections may be combined into one section. This is often done when the literature review is relatively brief and the focus is on introducing the research topic and providing some context for the study. Combining the Introduction and Literature Review can help streamline the article and make it more concise. However, in other cases, separating the Literature Review from the Introduction may be more appropriate, particularly when the literature review is extensive and detailed. It ultimately depends on the preferences of the author and the requirements of the journal or publication.