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The Incorporation of Concept Mapping as a Pre-Writing Strategy to Improve English as a Foreign Language Learners' Writing Performance: The Case of Third Year Students of English at Biskra University

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Declaration

I, Meriem **HENOUDA**, hereby certify and confirm that this thesis entitled, “The Incorporation of Concept Mapping as a Pre-Writing Strategy to Improve English as a Foreign Language Learners' Writing Performance: The Case of Third Year Students of English at Biskra University” is entirely my own product, which has been written in my own words. This thesis has not been falsified or used for other educational purposes or examinations. Additionally, all sources used have been properly acknowledged

Meriem **HENOUDA**

Date: 20/05/2024

Dedication

وانوار التمام لنا تجلت ولولا الله ما كنا وصلنا

﴿وَأَخِرُ دَعْوَاهُمْ أَنْ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ﴾

In loving memory of the man who served as my inspiration, first-ever hero,

My dependable source of support

Your compassion, wisdom, and everlasting love still influence my life

Your warmth and laughter are engraved far in every cherished memory

I once promised you... and I hereby fulfil it...

With love and appreciation for everything you offered, **Dad**, this piece is first dedicated to
you.

Mommy, the blessing, the twin of soul

Your unconditional love, selflessness, and nurturing spirit are unparalleled

I appreciate your prayers, countless sacrifices, and endless patience

My confidant and best friend

Sister

You made the good times even more enjoyable

I cherish every single moment with you

I am grateful for your love and guidance

Thank you for being with me every step of the way

To my **Brothers**

Thank you for your assistance

To all those who truly love me

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Abstract

Writing is a multiplex and multifaceted activity, with content, organisation, and mechanics being critical component sub-skills of writing that help in producing pertinent and well-constructed text. Despite the significance writing holds, the majority of third year students of English at Biskra University were observed to possess basic writing difficulties, struggling with producing coherent and well-structured pieces of work. Operating within a pragmatic paradigm and adopting a Mixed-methods approach, the current investigation aspired to examine the impact of employing concept mapping as a pre-writing strategy on students' writing performance with respect to content, organisation, and mechanics. It also sought to identify their attitudes towards its implementation in the pre-writing stage of the writing process, along with the endeavour of exploring the fundamental obstacles faced by students while immersed in the writing task and the factors underlying these struggles. Adopting an embedded mixed-methods research design, this research used a student semi-structured pre-treatment questionnaire, a teacher semi-structured questionnaire, a pretest and posttest, and a student semi-structured post-treatment interview in order to collect adequate data from an experimental group of 31 third year students of English at Biskra University and from 10 teachers of the written expression course. Findings exhibited a number of writing difficulties and contributing factors. They also suggested that concept mapping can be an effective pre-writing tool for enhancing writing performance in relation to content and organisation, with its efficacy manifested through genuine interest and a favorable stance elicited by the participants.

Keywords: Concept mapping, content, mechanics, organisation, underlying factors writing performance, writing struggles

List of Abbreviations and Acronyms

FLL: Foreign Language Learners

ELT: English Language Teaching

EFL: English as a Foreign Language

ESL: English as a Second Language

ICC: Intraclass Correlation Coefficient

Cmap: Concept Map

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General Introduction

1. Background of the Study

The English language has a long historical development. Most notably, its position has shifted dramatically to preoccupy a universally prime status, thereby becoming the most widely used means of communication worldwide. As a matter of fact, and because of its role in the fast-moving world, English appears to take precedence over the mother tongue in a myriad of countries. It was for that reason that the number of non-native English speakers has far surpassed that of native speakers. In the current era, and since the scope of English has increasingly widened, it is not surprising that it maintains its dominance over a wide variety of real-life contexts, ranging from politics and commerce to tourism and education.

The role of English in today's educational settings has increasingly been brought to public consciousness. Therefore, students with higher-level language skills will have more chances of admission, promotion, and publication, as the language can potentially open the door for new opportunities either in academic or workplace settings. Apart from developing the ability of listening, speaking, and reading, becoming a proficient language learner mandates a strong foundation of writing skills. Encouraging students to become effective writers has been an integral part of education for centuries. Nevertheless, what has changed over time is the focus of writing instruction. To illustrate, the Greeks uniquely emphasised rhetoric, or persuasive writing.

It is now common knowledge that the writing skill is a predictor of academic success, for it is not only a tool for learning about the subject matter but also for communicating thoughts. For this reason, teachers often seek to provide long-needed guidance for students to become proficient and flexible writers who can typically produce a clear and logical piece of writing regardless of its format, context, and purpose. Just like reading, writing is not always a pleasant experience (Bai, 2016). Rather more often, it can be regarded as a daunting task not

only for non-native speakers but also for native speakers as well. This stems from the fact that writing is complex in nature (Bentley, 2013; Hyland; 2003; Klimova, 2013), involving the vital aspects of planning, composing, editing, and revising, along with the subskills of spelling, punctuation, capitalisation, grammar, word choice, and sentence structure.

Despite the fact that the beginning of writing is the most distressing part of the entire writing process, the literature accentuates that a good start may potentially save students time and guide them throughout the composing process. Pre-writing (planning) is the first and most critical stage of the writing process, for it establishes a solid foundation for the act of composing and guides writers through the exploration, generation, organisation, and clarification of their thoughts. Despite its significance, pre-writing is still one of the most neglected stages in the writing process. In this regard, the majority of students do not employ pre-writing strategies put at their disposal, such as concept mapping, which allows them to visually map and connect the initial generated ideas in the form of a hierarchical network.

2. Statement of the Problem

In order to meet the growing demands of tertiary education, there is a tremendous need for promoting and extending students' knowledge and abilities about basic writing skills. The conception of writing has evolved from a simplistic perception as the mere production of written sounds to a more sophisticated view that captures its complex and multifaceted nature, acknowledging that it involves higher-order thinking skills and abilities. This perspective regards writing as an intentional, purposeful, and social act that aims to produce a text by systematically undergoing the major stages of generating ideas, planning, drafting, revising, and publishing.

The fact that the practice of writing requires proficiency in and interaction between multiple interactive sub-skills, including content, vocabulary, organisation, audience, purpose, and mechanics, implies that any inefficiency in any of these areas or components will lead to poor writing performance and meaning dilution. This gives a good indication that the writing skill is more susceptible to multiple infelicities and complexities, which is particularly the case for EFL learners who, regardless of their overall language competence, collectively perceive writing as an especially demanding skill.

In this respect, despite the solutions proposed by the myriads of research studies carried out at Biskra University in pursuit of enhancing students' writing abilities, a great number of students still exhibit some writing difficulties and lack writing proficiency. Despite spending a significant amount of time learning to write effectively, along with teachers' persistent efforts to support students in getting through their writing struggles, the majority of third year students of English at Biskra University fail to produce informative, accurate, and coherent written work. Noticeably, they do not seem to possess a basic writing level that adequately meets the demands and requirements of tertiary education.

This majorly germinates from the researcher's active and careful observation of some writing situations when students were unable to convey their thoughts in a clear or cohesive manner, leading to uncertainty or confusion in the writing. This was fundamentally corroborated by the engagement in a thorough discussion with a teacher of written expression. This teacher, who is supposed to be an expert educator, served as a valuable source of information for endorsing that the writing behaviour of third year students is poor, indicating frequent and potential writing struggles. Fundamentally, according to him, some suffer from the failings of organising ideas, while others find it difficult to generate pertinent details. Some have trouble getting started; whereas, others cannot maintain the network of information.

These perspectives emphasise the need for employing more focused and efficient approaches and methodologies to help students strengthen their writing skills. In view of the fact that pre-writing is the most crucial stage in the writing process, the current investigation suggests applying a well recognised strategy known as concept mapping to potentially assist students to write masterfully and maintain the logical progression of ideas. Given the multicomponent nature of writing, the study's focus targets the precisely defined writing subskills of content, organisation, and mechanics. That is, more precisely, the researcher, throughout the present research, majorly strives to delve into the extent to which the implementation of concept mapping as a pre-writing strategy impacts the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics.

3. Research Questions

The current research seeks to answer the following research questions:

RQ1: What are the main difficulties encountered by third year students of English at Biskra University while engaged in the writing task?

RQ2: What are the most prevalent causes of writing difficulties among third year students of English at Biskra University?

RQ3: To what extent does the use of concept mapping as a pre-writing strategy impact the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics?

RQ4: What are the attitudes of third year students of English at Biskra University towards the use of concept mapping in the planning stage of the writing process?

4. The Research Hypotheses

Based on the aforementioned research questions, the following research hypotheses are formulated:

RH1: Potential writing difficulties encountered by third year students of English at Biskra University while engaged in the writing task may encompass the inability to generate pertinent ideas and connect them logically.

RH2: Possible reasons contributing to the writing difficulties of third year students of English at Biskra University may involve insufficient opportunities for practicing writing coupled with the disuse of effective writing strategies.

RH3: Implementing concept mapping as a pre-writing strategy may foster the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics.

RQ4: Third year students of English at Biskra University may have positive attitudes vis-à-vis the implementation of concept mapping in the planning stage of the writing process.

5. The Research Aims

The general objective of the current study is to investigate and foster the writing performance of third year students of English at Biskra University through the employment of concept mapping in the pre-writing stage.

More specifically, this research work aims to:

- explore the basic difficulties faced by third year students of English at Biskra University while immersed in the writing task,
- identify the factors underlying the writing struggles among third year students of English at Biskra University,

- examine the practicality of concept mapping as a means to promote the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics, and
- identify the attitudes of third year students of English at Biskra University with regard to the use of concept mapping in planning the writing activity.

6. The Research Methodology for this Study

The decision on the appropriateness of each research component or methodological selection is heavily shaped and driven by the researcher's philosophical orientations, study's nature, research objectives, and research questions. Within the scope of the current research project, the researcher strives to identify the principal writing hindrances, along with their leading factors, as well as examine the practicality of the concept mapping pre-writing strategy as a means to promote students' writing performance. At its core, and since the study involves the practical implementation of the concept mapping strategy, the researcher further seeks to explore the attitudes of participants with regard to its utilisation in planning the writing activity.

Reflecting on the study's nature, research questions, and objectives, this research is designed to intermix the quantitative stance with the qualitative perspective, thereby employing the pragmatic research paradigm. In essence, since a research paradigm provides a distinctive conceptual framework for structuring the multitude of research components and guiding the researcher throughout the research process, the research approach, strategy, data collection methods, and data analysis procedures will be subsequently specified. Since the inquiry works with a pragmatic orientation, it typically adopts a Mixed-methods approach, which combines quantitative and qualitative methodologies.

Seeking an in-depth investigation of the research problem, the current inquiry operates under an embedded mixed-methods research design through which the qualitative data can help explain or interpret the quantitative findings. This typically seeks to provide a more complete picture of the effect of concept mapping on writing performance and the way the participants experience the intervention. Practically, data collection comprises utilising an extensive range of instruments, following a multi-method procedure. This is made possible through triangulation, allowing us to cross-verify, compare, and contrast the results obtained from diverse data collection tools. This assortment of instruments represents a student pre-treatment questionnaire, a teacher questionnaire, a pretest and posttest, and a student post-treatment interview.

Such data collection methods are determined to be appropriate for directly measuring variables, with each data gathering method capturing distinct facets of the research problem, thereby gaining a thorough and deep grasp of the research phenomenon. Since this investigation reflects a Mixed methods-based study, the researcher combines objective measurements and quantifiable data along with textual and non-numerical data, the analysis of which requires a mixture of procedures from both approaches. As far as this study is concerned, data analysis is conducted by means of statistical analysis, using descriptive and inferential statistics, and qualitative analysis, embracing a thematic analysis method. Both procedures are characterised by the use of computer applications and software, namely SPSS (for statistical analysis) and MAXQDA (for qualitative data coding).

7. Population, Sample, and sampling technique.

The present inquiry is not geared towards drawing general conclusions and inferences beyond the realm of the study's context or simply about the larger population. Given that generalisation is not the focus of this research, working on a small-scale subset of units is more manageable and practical. In a broad sense, third year students of English at Biskra University and instructors of English at Biskra University define and constitute the population of the study. In the pursuit of collecting adequate and relevant data from a limited number of units of interest originally belonging to the study's targeted and defined population, the non-probability sampling approach was adopted. Following this, and to be more precise, non-probability convenience sampling was typically embraced to establish the study sample, which particularly comprises 31 third year students of English at Biskra University, along with 10 teachers of the written expression course.

This sampling technique is based on a pre-planning process-driven approach under which participant selection was guided by the researcher's subjective judgement and not on a statistically random basis. In view of the convenience sampling technique, the researcher selects the participant group that is readily available and convenient to be included in the study. That is, the participants are chosen based on their accessibility and availability for research purposes. This derives from the researcher's direct engagement and interaction with them as their classroom instructor. In this regard, it is perceived as the quickest and easiest way to gather data and the best-suited sampling technique to achieve the study's purposes. Since this method may bring about the problem of bias, it is unlikely to produce a representative sample or generalise the obtained findings.

8. Significance of the Study

The current research project brings to light insights into the nature of the relationship between the so-called concept mapping and writing performance. Notably, this research serves to uncover some of the fundamental writing difficulties and whether the chosen participants suffer from poor planning. It also guides us to determine the contributing factors underlying students' writing struggles, thereby drawing appropriate conclusions and deriving adequate recommendations. This implies that the results of this study, in particular, may potentially be advantageous in the area of research on writing, serving as a reference or existing literature for further research projects and endeavors to build upon.

Most importantly, the present study provides long-needed guidance for any individual who suffers from failings in planning the writing task, putting ideas on paper, and keeping track of their thoughts. In addition, it may be of great importance to low-achieving writers, for it strives to promote their writing performance through the employment of the concept mapping strategy in the pre-writing stage. This may likely assist them in getting started and producing coherently organised essays. This study provides insights and guidance for teachers who may wish to use the concept mapping strategy for the purposes of content knowledge organisation, course content delivery, project-based learning, data analysis, curriculum and lesson planning, project management, cross-curricular connections, assessment, and evaluation.

In broad terms, this research may potentially help anyone who attempts to utilise graphic organisers, in general, and concept mapping, in specific, as it aspires to build a strong foundation of the concept mapping approach, including its components, creation, and applications. In particular, and irrespective of their age, language proficiency, discipline, academic orientation, and profession, people in the world can consult this thesis for any detail or explanation about when, where, and how to plan, construct, and finalise a concept map.

Clearly said, since this visual organiser is meant to accomplish varied tasks, it can essentially serve as the basis for introducing new materials, conceptualising relationships, planning instruction, clarifying complicated relationships, and disseminating new information. It can also guide those who are interested in employing concept mapping in the areas of brainstorming and idea generation, prior knowledge activation, note-taking, strategic planning, reading comprehension, listening comprehension, speaking performance, knowledge organisation, problem-solving, exam revision, memory enhancement, strategic learning, and planning studies/term projects. In view of the aforementioned points, it can be said that this study merits consideration.

9. Delimitations of the Study

The current research work examines the impact of the concept mapping prewriting strategy on writing performance in terms of content, organisation, and mechanics, with certain delimitations and restrictions to maintain the study feasible and focused. Third year students of English at Biskra University are uniquely selected as the population of this study since they are in their final year of undergraduate studies and in the course of learning and developing the necessary skills required to write their master's dissertations. This involvement in academic writing makes them an appropriate group for studying the effect of implementing concept mapping.

Principally, instead of spreading attention across several components criteria, the present study purposefully limits its scope to three elements of writing performance, namely content, organisation, and mechanics. This enables a more thorough examination of every selected element, maintaining that students' development could be closely tracked and precisely evaluated during the course of the study. The present investigation is geographically confined to Biskra University, enabling more effective data collection and easier access to the study's targeted participants.

10. The Referencing Style for this Dissertation

It is widely accepted that the primary determinant of the writing style (referencing style) to be employed throughout the research process is the area of research. Consequently, and given that the present investigation falls under the category of educational research, with its origins in the social sciences, the APA 7th edition (American Psychological Association) is consistently applied to compose the various sections of this research project. Notably, the supervisor's guidelines and rules with regard to some elements, such as the cover page layout and text justification, control and pertain to some choices.

11. Structure of the Dissertation

The following outline guides the structure of this thesis:

Chapter One is an overview of the skill of writing, providing a detailed and comprehensive description of its definitions, approaches, components, and stages. It also focuses on language learning strategies, writing strategies, and pre-writing strategies.

Chapter Two illustrates and overviews Novakian concept mapping, along with its characteristics, theoretical underpinning, types, components, creation process, and applications.

Chapter Three overviews the widely accepted methodological elements that form the basis for research studies before moving on to elicit the entirety of the methodological components that constitute the framework for the present study. This includes the research paradigm, approach, design, data collection methods, analysis procedures, and sampling techniques. It further provides the necessary rationale for each methodological selection and decision.

Chapter Four is designed to exhibit, summarise, analyse, and interpret the mass of datasets collected throughout the course of the inquiry. It manifests data analysis procedures, statistical instruments, and computational software applications employed to analyse quantitative and qualitative data.

Chapter Five synthesises the results and data obtained from all data collection methods to draw conclusions about the raised research questions and formulated hypotheses. It also sets out to offer some strategic recommendations and pedagogical implications, along with suggestions for future research exploration and endeavors.

Chapter One: English as a Foreign Language Writing

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Conclusion

Introduction

The purpose of this chapter is to theoretically ground the skill of writing in a foreign language, by attempting to provide a detailed and comprehensive description of its major aspects and basics. First, it explains how writing is viewed by different educationalists by critically highlighting diverse definitions. Since writing is a multiplex activity, the chapter, then, provides insights into the range of sub-elements of quality writing, as well as the stages central to the writing process, without forgetting to shed light on the most common approaches used in writing instruction. Second, it also elucidates common language learning strategies, writing strategies, and pre-writing strategies. Third, this chapter also gives an overview of concept mapping and its significance as a pre-writing strategy. Finally, since most individual writers produce lower-quality writing as evidence of their writing struggles, a view regarding the most frequent writing difficulties, along with the factors affecting writing performance is documented.

1.1 Definition of Writing

The understanding of writing, like many other language skills, has evolved and developed over time. Chiefly, it can be approached and interpreted from distinct scholarly perspectives. In this respect, its explanation is guided by various scholars, disciplines, and schools of thought, leading to diverse definitions. The following section accentuates a few examples of how writing is viewed. As such, Crystal (1995) simply views writing as the act of creating, organising, and putting a set of visual marks onto a surface. Following this, Bentley (2013) defines writing as a way that entails producing signs on the page to convey a message. Writing, for Widdowson (2001), is seen as the application of visual elements to manifest the different systems of language, such as graphology and grammar.

These definitions highlight that writing has been simply used to refer to a system of graphic symbols and grammatical rules. To explain, it is seen as a means of expressing thought via the letters or symbols that are written or inscribed on a surface and through the use of rules governing the construction and organisation of sounds, words, and sentences. It is important to note that these definitions do not explain the complexity of writing as this skill is not simply a matter of communicating ideas by producing graphic symbols and using grammatical rules.

Some authors appear to introduce other insightful viewpoints on the essence of writing. Accordingly, they directed attention to different elements other than basic mechanical skills (handwriting, grammar, vocabulary, spelling, and punctuation). By way of illustration, some view it as a complex activity through which the writer can be well engaged in specific thinking processes (Flower & Hayes, 1981) or interact individually and socially (Hyland, 2003). Hedge (2000) avers that writing can be understood as a skill that requires the employment of specific strategies, along with distinctive activities, examples of which are defining objectives, structuring information, idea generation, drafting, reviewing, revising, editing.

In accordance with these definitions, it is critical to consider that writing is in principle an intentional, complex, and multifaceted cognitive activity, requiring a huge mental task. It involves higher-order thinking skills based on diverse mental processes and abilities. To produce a coherent and well-structured piece of work, writers must typically plan and organise their thought, thereby undergoing the major stages of generating ideas, planning, drafting, revising, and publishing. Hyland (2003) makes the very useful point that writing is not only a personal activity but also a social task and endeavour. This gives a good indication that considering a specific audience and purpose are fundamental principles of effective writing. The style, tone, and writing topic are significantly determined, to some extent, by the audience for whom writing is addressed.

1.2 Approaches to Teaching Writing

Writing is an essential language skill, for it yields a significant impact on academic and professional success. Educators often seek out the most relevant ways that can best be used for writing instruction. In this regard, they often embrace methods that align with their teaching philosophy, student needs, and the aims of teaching. Some aspects of the writing process received more attention than others. Therefore, different writing approaches came into existence. Some approaches are the controlled-to-free approach, the free-writing approach, the grammar-syntax-organisation approach, the paragraph-pattern approach, the communicative approach, etc. (El Ouidani, et al., 2022). This section, however, discusses some of the most common approaches to the teaching of writing namely the product approach, the process approach, and the genre approach.

1.2.1 The Product-Oriented Approach

The product-oriented approach is a well-established approach that gained attention in the 1960s, when the audiolingual method of teaching foreign languages was eminent. It focuses on the quality of the final written piece of work, placing less importance on the process of writing itself (Harmer, 2007; Kumar, 2020). To explain, students write with the end product in mind, without interest in the steps taken towards the finished product. It is important to note that such elements as meaning, purpose, audience, and context are essentially ignored while grammar, spelling, and punctuation are emphasised. The writing classroom focuses on language structure; therefore, students are expected to produce error-free and neatly presented pieces of writing (Harmer, 2007; Kumar, 2020). Within the framework of this approach, the grading system is structure-oriented, focusing highly on language form and grammatical accuracy.

Students, unlike in process writing, are not supposed to spend time brainstorming ideas. Instead, the classroom activities are designed to help students thoroughly read a model text (emails, reports, recipes), and discover and analyse its generic features (lexis, grammatical patterns, vocabulary, text organisation) (Kumar, 2020). To help guide instruction, teachers' feedback is encouraged throughout varied steps. His role is utterly restricted to assigning grades by checking whether the linguistic features of students' writings are appropriate and grammatically sound. Through controlled activities and carefully planned exercises, students have to practice the essential features of the text genre they are required to write about. The product approach encourages students to brainstorm and organise the content, as well as the language structures that might be essential for producing the text. Nevertheless, multiple drafts are not required.

1.2.2 Process-Oriented Approach

The process-oriented approach is yet another well-founded approach to writing instruction. It perceives writing as a collaborative task rather than a mechanical activity that adopts and imitates a model text in the interest of constructing a similar structure-based written product. The development of language use takes precedence over the linguistic features and structure of ideas (Harmer, 2007; Klimova, 2013). Aspects such as meaning, purpose, and audience are all taken into account. The primary focus is on the steps that a writer takes towards the end product. This gives thoughtful attention to possible skills and stages that writers typically go through to produce good finished products of writing.

The stages, according to Harmer (2004) may well involve, but are not exclusively limited to, four major phases: planning, drafting, editing, and writing the final draft. Compared to the product approach, the process approach to writing advocates the use of multiple drafts, therefore, considering 'editing' as an essential part of the writing process. Within this framework, not only will the final product be marked by the teacher, but also various drafts and

outlines. That is to say, in the grading system, the drafts and outlines are more valuable than the finished product.

1.2.3 Genre-Oriented Approach

The genre-oriented approach is one of the most commonly used approaches in ELT. It is considered popular and new in teaching writing. Badger and White (2000) report that there are remarkable similarities between product approaches and genre approaches, with the latter often viewed as a progression and enhancement of the former. To explain, both approaches share certain fundamental methodologies and principles. This implies that the genre approach may build upon the foundation of the product approach, and to well understand genre-focused elements, one might need to draw from product-focused knowledge. In spite of the fact that a genre-based approach views writing as primarily linguistic, highlighting that it is contingent upon the social environment in which it is generated. It is clear then that varied genres are associated with various contexts.

It is important to note that the primary focus of the genre approach is the social context, focusing on the communicative purpose underlying it. Fundamentally, diverse genres of writing, such as recipes, reports, or, stories, serve various purposes and meet specific needs (Badger & White, 2000). With this in mind, and as with the product approach, students research works and read model texts of the genre they plan to write in before starting the composition process. For example, if the teacher wants students to write scientific book reviews, s/he should expose them to scientific book review samples first before asking them to create their own, considering the social purpose. Similar to the product approach, the students would, in light of the genre approach, conduct an examination of the text, searching for specific vocabulary patterns and grammar constructions.

The debate over which approach is better to use or be dominant in writing classrooms has been ongoing for many years. Some concentrate on the end result of the writing process while others focus on the process of writing itself. It seems that each writing approach yields a set of advantages and disadvantages. While it helps students learn what good writing looks like by focusing on the accuracy of their writing, the product-oriented approach gives less importance to the process stages and skills brought to the writing task. Likewise, the process-oriented approach can sometimes be considered time-consuming, for it pays attention to the different stages and processes involved in producing a text.

The genre-oriented approach, on the other hand, makes the very useful point that writing is contingent on the social environment; however, it overlooks the skills required in the writing activity. It should be noted that all approaches are, to a certain extent, valuable. The efficacy of an approach can be substantially decided by various factors, including the goals of the writing instruction, students' needs, and the context of the classroom. Teachers, as a result, may feel the need to adopt a generic and eclectic approach to writing instruction by drawing upon the strengths of each approach.

1.3 Writing Components

Writing serves as an appropriate tool for expressing ideas, thoughts, and feelings. To effectively transmit a specific message and convey a given meaning, the practice of writing strives to produce pertinent and well-constructed texts that are predominantly the end result of a collection of component skills. It is for this reason that the act of writing is principally perceived by most educationalists as a complex mechanism. It is well established that these elements are fundamental, interactive, and complementary in the sense that any inefficiency in any one of them will result in distracting and diluting the meaning. Klimova (2013) posits that the elements of quality writing are content, vocabulary, organisation, language use, and mechanics.

As stated by Hyland (2003, p.32), skilled writers must reveal at the very least four fundamental competences that are essential for effective writing in English. These comprise:

- Grammatical competence: knowledge of grammar, vocabulary (lexical items), and the language system.
- Discourse competence: understanding of genre and ability to produce coherent and cohesive utterances.
- Sociolinguistic competence: rules of language use in terms of formality, politeness, and relevance of meaning to context. This means knowing how and when to use language effectively and appropriately in various situations.
- Strategic competency: capacity to employ a number of communicative strategies to effectively communicate meaning.

Bentley (2013) lists a range of sub-skills that fall into two large constructs, namely accuracy and communicating meaning. For them, accuracy, which directly relates to language form, involves spelling, handwriting, punctuation, layout, vocabulary, grammar, and syntax. The successful communication of meaning requires both sufficient ideas and an appropriate way of organising them. Harris (1969) recognises content, form, grammar, style, and mechanics as the general component skills of writing. Reflecting on the above views, and considering Figure 1.1, the components criteria of effective written text include at least the following elements:

Figure 1.1*Elements of Writing*

Note. From *Different Approaches to Developing Writing Skills*, by I. A. Dragomir And B. O. Niculescu, 2020, *Land Forces Academy Review*, 3(99), p. 203, DOI: 10.2478/raft-2020-0024

1.3.1 Mechanics

Mechanics refer to graphic rules, technicalities, and conventions that should be considered when making up accurate and readable language. Writers should pay attention to avoiding errors and mistakes that may obstruct the transmission of meaning or communication of ideas Bentley (2013). Simply, they need to check and proofread the work for any problems with regard to capitalization, punctuation, abbreviation, layout, spellings, and handwriting. Simply knowing the mechanisms and standards does not provide learners with enough knowledge about learning how to write effectively.

1.3.2 Grammar

Grammar refers to the employment of grammatical knowledge of the language governing word formation and sentence construction. Good writers should be comprehensively knowledgeable about how words are formed (morphology) and how these words are arranged to structure phrases, clauses, and sentences (syntax). Bentley (2013) explains that grammatical forms describe three aspects. These are parts of speech (nouns, verbs, adjectives, adverbs, determiners, prepositions, pronouns, conjunctions, and exclamations), grammatical structures (a specific arrangement of words produces a structure -form- that yields meaning -use), and how words are formed (new words can be created when prefixes and suffixes are added to base words). It is evident that well-formed words and well-structured sentences help convey ideas clearly and accurately, allowing readers to keep the writer's track of thought.

1.3.3 Audience

Just like the way oral presentations or speeches are tailored and adapted to fit the interests of the audience, the decisions concerning the style and structure of written work should also correspond with the targeted audience. Although the audience can simply and most of the time be the teacher, writers can further write to peers, parents, experts, and technicians, or a mix of these. Writing is a thoughtful and carefully crafted process. Knowing who you are writing for from the early stages of writing is crucial to producing reader-based prose. A written production that conforms with the readers' expectations encourages them to effectively capture the message and meaning of the text, as well as keeping their engagement high. Nevertheless, developing a sense of audience can be a demanding task. It is sometimes challenging for writers who do not closely know the audience to decide about their features. Student writers need to learn to develop their ability of considering audience awareness. This is because audience awareness is one potential feature of qualified writers (Rahmat, 2016).

Audience awareness means understanding and reflecting on the reader's background, including such considerations as gender, age, social class, nationality, ethnicity, religion, economic status, sexual orientation, education level, attitudes, and beliefs. In that sense, under the framework of what they called the 'parameters of audience influence model', Grabe and Kaplan (1996) explain that texts can vary in response to changes in five elements (as cited in Rahmat, 2016). These are the number of text readers, social closeness, social status, background knowledge, and topical knowledge. Finding out and becoming conscious about these parameters serves to guide writers in shaping the text in terms of content, tone (degree of formality and politeness), style, structure, and language (Dragomir, 2020; Kalfut, 2021; Rahmat, 2016). For example, knowing that the intended audience might be specialists in physics triggers the writer to come up with a highly informative expository text that aims to provide readers with a more extensive base of knowledge about a scientific subject. Accordingly, it requires scientific and formal language, style, and vocabulary.

1.3.4 Purpose

Probably one of the most central questions authors should consider before engaging in any writing project is 'why am I writing?'. Writers tend to write to realise and fulfill a specific aim (Hyland, 2003). Scholars have long determined concern about the issues of purposefulness in writing, pointing to the fact that varied written texts (genres) yield a multitude of communicative purposes. Notably, genres may include poems, novels, advertisements, lectures, biographies, articles, tickets, letters, scientific reports, and many of these. The purpose reflects the reasons for writing or, simply, the intentions of authors who may wish to communicate ideas for the sake of informing, persuading, instructing, entertaining, inviting, describing, apologising, narrating, offering, evaluating, suggesting, and many others (Dragomir & Niculescu, 2020; Harmer, 2004). Writers should consciously develop a sense of purpose so

as to guide the choice of what to include and how to say it. This is in terms of content, form (structural pattern of text), register (type of vocabulary), grammar, and tone.

1.3.5 Content

Another element the writers need to be attentive to is the content knowledge they are required to write about. To write meaningfully about a particular subject area, authors endeavour to generate relevant, clear, and detailed initial notes that will result in a logical progression of ideas. However, they are likely to find it arduous to proceed with planning and drafting about a theme or topic they have little or no background knowledge about. The teacher may serve as an appropriate guide for students to develop good knowledge about the assigned topic (schemata). As such, Harmer (2007) suggests the use of schema development tasks such as brainstorming activities to stimulate ideas for writing. The students may also read books to seek relevant information, work collaboratively to generate early thought, as they may conduct further research to supply useful support.

1.3.6 Word Choice

Word choice denotes the accurate and appropriate employment of specific vocabulary (diction) to help achieve a well-determined communicative purpose and transmit a particular message to a specific group of readers. It is accepted that vocabulary is a fundamental predictor of writing skills, just as it is for language proficiency and EFL learning. Vocabulary usage and word choice are predominantly determined by the purpose, audience, and tone (Harmer, 2004). The topic of the writing may also affect the selection of text words. As such, the lexical items used to write a business report will be distinct from those associated with writing a friendly letter. Learning an individual word does not only entail comprehending its meaning, but it also comprises being aware of its structure/form (what part of speech it is), pronunciation, spelling, and grammatical function (Bentley, 2013).

As a matter of fact, lexical knowledge is one of the most common English difficulties. Any vocabulary misuse will likely change and diffuse the message, resulting in confusion or miscommunication. Hedge (2000) affirms that errors in vocabulary are more prone to cause confusion compared to those in grammar. Therefore, effective writers need to emphasise the selection of the best-suited and most fitting lexical units from a wide range of vocabulary items. Scholars, like Johnson (2008), suggest the use of a myriad of strategies for fostering vocabulary learning, among which he lists: semantic maps, word interest, journals, wide reading, teacher language, and word walls.

1.3.7 Organisation

Producing well-formed and high-quality writing stresses the need to focus not merely on word choice, audience, purpose, and content but also on text construction patterns. The successful and effective communication of meaning requires an informed selection of adequate text structure and content organisation. Each genre has specific formats and a strict way of designing its organisational structure and layout. That is, varied genres of writing employ distinct textual structures (Harmer, 2004). Therefore, the writer needs to plan as to which form the text should appear. A recipe, as an illustration, should not look like a poem or like a scientific report.

Text organisation is in principle at the level of sentences, paragraphs, and the overall text (Dragomir & Niculescu, 2020; Harmer, 2004). Thoughts, evidence, and sentences have to be ordered and sequenced in a planned and meaningful manner to help demonstrate a more logical flow of ideas. The importance of building clear and orderly body paragraphs on the basis of individual sentences is also highlighted. Good paragraphs should be developed and arranged in a progressively systematic way, with one section naturally leading to the other. This is important to properly achieve a structured and unified piece of writing that facilitates the readers' understanding of the content and guides them to move smoothly between sentences

and paragraphs. Connectives and transitions are essential in connecting ideas and ensuring the logical transition between sections.

1.3.8 The Writing Process

Writing is more than putting words on paper. It typically implies a number of meaningful activities and underlying processes. Scholars in education have delved into the intricacies of the writing process as to which stages are central to the writing activity. As a matter of fact, there is no single universal classification of stages. Some stages were embedded in others while other stages came to be called differently by different scholars. This section, however, seeks the five-step writing process approach described by Risinger (1987), who describes pre-writing, drafting, revising, editing, and publishing as the most common steps or stages that effective writers often follow. Such stages have been described by Levstik (1999) as experiences of the composing process (as cited in Lipson & Wixon, 2009).

Traditionally, under the framework of the linear stage model of writing, the composing process was thought to be linear. Later, studies such as Flower and Hayes (1981) perceived it differently. In reality, the writing process is a non-linear activity that proceeds in a recursive way. Any of the stages can reoccur and be revisited several times. For example, the writer may wish to go back to the planning stage while s/he is editing the work. The mental activities can spontaneously take place at any point in the composing process, as the writer can move freely through different writing stages.

1.3.8.1 Pre-writing Experiences

Pre-writing (planning) is the first and most critical stage of the writing process, for it establishes a solid foundation for the act of composing and guides writers through the exploration, generation, organisation, and clarification of their thoughts. To clarify, pre-writing involves making detailed and initial notes about what it is they are going to write before they actually start composing a draft. Flower and Hayes (1981) capture that pre-writing is a

preliminary stage before the actual composition of words takes place. Eventually, when planning, writers think about creating a tentative plan through which they can particularly generate ideas, gather information, and plan their work. In addition to its practicality in generating early thought, the preliminary plan is also thought to be viable in promoting creativity and activating writers' prior knowledge, allowing them to tap into what they already know about a given topic.

It is worth remembering that the pre-writing phase stresses the need to clearly define and consider the topic for the writing task, its purpose, content, and target audience. This stage can be effectively achieved using multiple techniques, some of which include listing, traditional outline format, brainstorming (individually or as a whole class activity), and visual diagrams or maps. Johnson (2008) adds silent thinking, power writing, and conversation with a neighbor as ways to generate ideas. Following this, Brown and Hood (2007) recommend the use of a set of pre-writing classroom activities such as reading a passage, clustering, skimming and/or scanning, and free-writing.

1.3.8.2 Drafting Experiences

Drafting, or the actual writing stage, as Risinger (1987) refers to it, is another important step in the writing process. During this stage, the students start writing by transforming the initial thoughts generated in the pre-writing stage into a draft document. The draft stage is, especially, crucial for creating a rough version of the text by putting content knowledge and translating ideas digitally or down on paper. The end result of the actual writing stage is a draft with a disjointed collection of thoughts. To be specific, the aim of this stage is not fundamentally to achieve error-free writing. It is important to remember that linguistic features are less of a concern than ideas in this phase. Chiefly, and at this level, writers concentrate and place emphasis on the content and its elaboration, without worrying about the mechanics of their writing (El Ouidani et al., 2022). In this sense, quantity should be prioritised over quality

(Johnson, 2008). That is to say, to maintain the flow of thought, it is essential to keep producing and sequencing the content without primarily worrying about grammar, punctuation, spelling, and capitalisation that will be revised and edited in later stages.

1.3.8.3 Revising Experiences

Producing a well-structured and insightful piece of writing stresses the need to go over and reflect on the draft document as part of the writing process, in a stage called 'revising'. Johnson (2008) avers that revising is the core of the composing process. This stage involves reading, reviewing, and revising the written product for any appropriate changes in content, organisation, and structure without paying too much attention to grammar and mechanics. Harmer (2004) stresses out that experienced writers are aware that the general meaning and organisation of their writing should take precedence over grammatical accuracy. Revision can be realised through self-correction or by receiving feedback from instructors or peers. It primarily addresses improving the draft in terms of clarity, coherence, wordiness, and effectiveness

The writer may work on adding, modifying, rearranging, or removing some sections, such as paragraphs or sentences. This may encompass, for instance, rewriting parts, revising thesis statements, adding or eliminating content, and rearranging ideas. One may come up with new thoughts and opinions that s/he did not consider during the first planning (El Ouidani et al., 2022). It is additionally essential in the revising stage to examine whether the objectives of the writing have been achieved and whether the piece of work is relevant to the intended audience. The revising phase aims to supply useful support for student writers who wish to improve the quality of their work, for it serves to minimise errors, enhance clarity, improve insights, and maintain smooth transitions between ideas.

1.3.8.4 Editing Experiences

Editing, which has been distinctly separated from revising, is a detailed and focused stage that precedes publication in the process of composing. Editing places effort on refining, proofreading, and correcting the work with regard to the mechanics of writing. The writer addresses the mistakes, errors, and irrelevancies appearing not only at the level of grammar but also in spelling, punctuation, capitalisation, referencing style, and formatting (Risinger, 1987). In this step, more than content, form, and structure become the sources of attention. Johnson (2008) claims that editing should not be part of the previous stages, for it disrupts the logical progression of thoughts and the overall quality of the text. In editing, the writer wishes to ensure high-quality writing that conforms to the writing conventions and formatting guidelines. Producing well-structured, error-free written work adds to its readability, making it sound more professional.

1.3.8.5 Publishing Experiences

Publishing is considered the final phase, where the revised and edited work is prepared for distribution, sharing, and publication. This involves submitting the piece of writing to the intended audience, who can be anyone interested in reading it, including the teacher, peers, family, community, or public. Depending on the writer's objectives, publication can potentially vary, entailing turning in the finalised product as a classroom assignment, uploading it online, submitting it to a publisher, or sharing it on social media (El Ouidani et al., 2022; Johnson, 2008). It is important to note that writers need to be aware of ethical issues and legal considerations, such as copyright, plagiarism, conflict of interest, and authorship before setting the document for publication.

1.4 Introduction to Language Learning Strategies

Almost all learning tasks place great emphasis on particular methods (what to use) and the ways these methods are employed (how to use them) in order to achieve their ultimate purposes. Along the way, and to approach instructional tasks, students may wish to potentially choose from a broad range of systematic ways. Some refer to these commonplace actions as ‘strategies’, ‘tactics’, or ‘techniques’. There is a general consensus among researchers regarding the effective and vital role of learning strategies in the learning process (Cohen, 1998; O’Malley & Chamot, 1990; Oxford, 1990; Rubin, 1975; Rubin, 1987; Stern & Patrick, 1992). A strategy, however, is the most commonly used term in second language acquisition research. Research into learning strategies was initiated with the work of Rubin (1975) who suggested that the characteristics of a good language learner could be determined by the careful examination of the strategies used by successful second language learners.

The term strategy lacks a universally accepted definition. Thus, to different scholars, a strategy means diverse things. In a broader sense, learning strategies have been perceived by Wenden (1987) as the numerous operations employed by learners to derive meaning and comprehend their learning while by Weinstein and Mayer (1983) as behaviours involved in learning. In her definition of learning strategies, Oxford (1990) spotlights the value of learning strategies in making a more efficient and meaningful learning experience. She adds that learning strategies maximises learning productivity, effectiveness, and outcomes, thereby making it more efficient, smoother, faster, and more pleasurable.

Other prominent researchers endeavoured to bring to light the issue of consciousness with regard to the use of strategies. Some claim that the use of strategies is completely automatic without consciously realising them. Others, however, conceive that students are consciously and explicitly aware of the strategies they tend to employ in performing learning tasks; therefore, they can easily identify and indicate them. In consideration of this, and

focusing on this point, Cohen (1998) and Chamot (2005) regard learning strategies as conscious plans adopted by learners to optimise learning outcomes and bolster language learning.

Reflecting on these definitions, learning strategies can be regarded as steps or practices consciously selected by learners in the learning process with the purpose of reinforcing acquisition, storage, retrieval, as well as boosting language competencies. As such, there are strategies for learning vocabulary, retrieving information, reading comprehension, rehearsing, writing, communication, and many of these. It is also worth bearing in mind that some strategies are often deemed more advantageous for a specific group of learners than others, as some are thought to be better suited for accomplishing given tasks than others. Some strategies are thought of as being generic and transferable in the sense that they are not specific to a distinctive task or domain. In fact, such strategies are applicable to an extensive array of tasks, skills, and domains.

1.5 Taxonomy of Language Learning Strategies

To better develop an understanding of language learning processes and to accurately gain insights about learning strategies, Chamot (2005) suggests the use of self-reports through one of the most commonly used methods that is questionnaires. An example of the latter is the Strategy Inventory for Language Learning (SILL) developed by Oxford (1990) as a tool to gather information on many language learners. Other methods, such as written diaries, stimulated recall interviews, and think-aloud protocols may also be used to indicate students' learning strategies (Chamot, 2005). It is pivotal to note that different students are more likely to approach the learning tasks and practices dissimilarly and uniquely, impacting strategic choices. Clearly, variation in strategy use is expected as it is indicated by a multiplicity of factors, including the learner's age, gender, learning styles, proficiency level, cultural differences, task, and context.

In one example of many, and unlike children who can be more influenced by concrete tactics and hands-on activities, older individuals have typically developed advanced cognitive capacities that help to accumulate knowledge using abstract thinking and make connections with pre-existing structures. Several researchers have been interested in describing and grouping learning strategies utilised by students of English as a second/foreign language (O'Malley & Chamot, 1990; Rubin, 1987; Stern, 1992). Although there is a distinct lack of consensus among many of them as to the precise classification of learning strategies, such taxonomies still reflect in some way or another the same types of strategies. To put it clearly, language learning strategies are classified into several general types, which have fundamental and complementary roles.

In one example of many taxonomies, Rubin (1987) appears to classify strategies into typically two primary categories: strategies contributing directly to learning and strategies contributing indirectly to learning. Rubin further identifies three groups of strategies that can influence language learning either directly or indirectly. These classes are as follows:

- Learning strategies
- Communication strategies
- Social strategies

Stern (1992) had a drive to direct attention towards five classes of language learning strategies that he names:

- Management and planning strategies
- Cognitive strategies
- Communicative-experiential strategies
- Interpersonal strategies
- Affective strategies

O'Malley and Chamot's (1990) classification of language learning strategies has gained ground in English language teaching, with an emphasis on such major categories as metacognitive, cognitive, and social/affective. It should be pointed out that there is not a clear-cut distinction between metacognitive and cognitive strategies because, in a sense, they are dependent on each other. Thus, one way that may help to distinctively understand each of them is through the goal/purpose of the activity.

1.5.1 Cognitive Strategies

Cognitive strategies are those techniques used by students to learn more effectively and that involve different aspects of acquiring, processing, and retaining information. They fundamentally entail the manipulation of language, either physically or mentally, to improve learning. O'Malley and Chamot (1990) remark, "cognitive strategies operate directly on incoming information, manipulating it in ways that enhance learning" (P. 44). Examples of cognitive strategies are skim reading, visualisation, repetition, summarising, note-taking, grouping, guessing meaning, using imagery for memorisation, organisation, deduction, inferencing, and linking new concepts to prior knowledge.

1.5.2 Metacognitive Strategies

Being described as thinking about thinking, metacognitive strategies are more concerned with understanding, regulating, and evaluating comprehension and the quality of learning, including the cognitive strategies employed. To this end, O'Malley et al., (1987) state that metacognitive strategies are the techniques that actively encompass the actions of planning, monitoring, and evaluation of the effectiveness of learning. Such a type of strategies is, then, essential in directing learners to reflect on and identify their abilities and approaches to learning. For instance, students may reflect on how effective they were throughout a task, which strategies they employ, which they find most beneficial, and what they might do to improve

future performance. To do so, students may use O'Malley and Chamot's (1990) suggested metacognitive strategies, namely selective attention, planning, monitoring, and evaluating. Chiefly, such strategies work on raising students' awareness of both their strengths and weaknesses, thereby encouraging them to become increasingly autonomous in their learning.

1.5.3 Social/Affective Strategies

Social/affective strategies represent the techniques employed by the learner that necessitate the involvement of another individual as a source of interaction with the learner or by taking control of one's own feelings in language learning. By way of explanation, O'Malley and Chamot (1990) declare that social/affective strategies are "a broad grouping that involves either interaction with another person or ideational control over affect" (p.45). According to authors, cooperative learning, peer work, questioning for clarification, and self-talk are some examples of social/affective strategies.

1.6 Writing Strategies

Although there is an ample body of literature exploring the wide range of language learning strategies, a limited number of research projects aspires to examine the various aspects of writing strategies. Generally, writing strategies are considered to belong to language learning strategies in that they are thought to be any conscious plan or action purposefully used by writers in the act of producing a written work. They can be useful tools for writers who wish to write more effectively and overcome writing difficulties. It is important to note that strategy use is a characteristic of process writing theory. Chiefly, proficient writers tend to be more strategic, using multiple strategies regularly (Hyland, 2003).

It is well established that such operations are necessary in the sense that they foster the development of the quality of students' written productions since they are particularly advantageous for generating ideas, planning, drafting, and revising their writings. It seems exceedingly significant, therefore, to focus on writing strategy instruction that significantly

benefits students in becoming more proficient writers. Many empirical studies have found that the use of writing strategies correlates fairly well with students' writing proficiency (Belén & Peñuelas, 2012; De Silva, 2014; Mastan et al., 2017; Sicat, 2022). Silva's (2015) longitudinal intervention study follows an experimental research design to examine the effect of applying writing strategy instruction on a group of undergraduate students in Sri Lanka. The findings revealed considerable improvements in strategy use and performance following strategy instruction.

Similarly, Mastan et al. (2017) conducted a study on applying writing strategy instruction to enhance 36 intermediate ESL learners' writing performance. Only the experimental group was exposed to the Self-Regulated Strategy Development (SRSD) approach. Results indicate that the intervention yielded a positive effect on students' writing achievement, with a significant increase in posttest scores. Likewise, the statistical analysis of Sicat's (2022) investigation also manifests a significant improvement in learners' paragraph writing performance after exposure to writing strategies. Understanding writing strategies may sometimes be a source of confusion for many ESL/EFL learners and instructors as to the existence of numerous studies each providing a specified classification and label. In this sense, the way they should be grouped is a source of debate (Hsiao & Oxford, 2002).

Leki's (1995) taxonomy of writing strategies consists of ten categories, namely: (1) clarifying strategies, e.g. Talking to peers about the assignment; (2) focusing strategies, e.g. Placing the essay exam question at the top of the essay; (3) relying on past writing experiences, e.g. Considering previous writing experiences to complete the new writing task; (4) taking advantage of the first language/culture, e.g. Referring to knowledge and experience of L1; (5) using current experience or feedback to adjust strategies, e.g. Giving feedback; (6) looking for models, e.g. Looking for models in articles; (7) using current or past ESL writing training, e.g. Using strategies taught in the previous writing class; (8) accommodating the teachers' demands,

e.g. Meeting the teacher's requirement; (9) resisting the teachers' demands, e.g. Resisting the assignment by ignoring the criteria that are given by the teacher; (10) managing competing demands, e.g. Managing course loads (Abas & Abd Aziz, 2016).

Yang's (2002) inquiry looks into how students apply strategies during the writing process. Yang discovered that effective writers are characterised by planning, focusing, and revising (as cited in Chen, 2011). Petrić and Czár (2003) validated a well-established writing strategy questionnaire that has yielded interesting results with regard to the analysis of participants' use of strategies. The questionnaire substantially manifests that writing strategies are subdivided into planning strategies (e.g. I write an outline of my paper), while-writing strategies (e.g. I reread what I have written to get ideas on how to continue), and revising strategies (e.g. I read my text aloud).

Mu (2005) builds his taxonomy of writing strategies on the basis of the analysis and synthesis of several classifications drawn from earlier studies on ESL writing strategies (Arndt, 1987; Riazi, 1997; Sasaki, 2000; Victori, 1995; Wenden, 1991, as cited in Mu, 2005). Reflecting on ESL writing theories, the author explicitly grouped the writing strategies into 5 broader categories (rhetorical strategies, metacognitive strategies, cognitive strategies, communicative strategies, and social/affective strategies), and 30 ESL writing strategies. Similarly, a 2012 study by Peñuelas sought to explore the strategy use of 231 American students when composing texts. The survey covered six writing strategy subgroups: memory, cognitive, compensatory, metacognitive, affective, and social strategies. The findings show that less proficient writers use several strategies with less frequency compared to expert students. In addition, proficient writers were found to utilise a wide range of techniques, with supremacy given to cognitive, metacognitive, and compensatory strategies, followed by affective, memory and social strategies.

The writing strategies indicated in the investigation carried out by Abas and Abd Aziz (2016), and which were employed in the writing process stages are linking the topic to prior knowledge and experience, considering the readers, outlining, talkwriting, freewriting, listing, text organisation, seeking help, concentrating on writing mechanics, and using online materials. To summarise, the aforementioned studies reveal a multiplicity of categorisations and a noticeable variation in writing strategies. This serves to help gain insights into the writing behaviour of students during the writing process stages. On this account, teachers may need to provide students with initial support to help them develop a variety of effective composition skills and writing techniques that may potentially be employed in accomplishing certain writing tasks and to guide them to internalise and use them independently.

1.7 Pre-writing Strategies

Although its stages can vary from one writer to another, the writing process generally embeds the steps of creating and refining the written product, starting from planning and organising thought to drafting and editing the text. Although some writers wish to dive right into drafting instead of beginning with pre-writing, the ones who appear to spend more time in this stage are more likely to produce a good finished work (Roberts, 2004). Pre-writing is the first and most important phase in the writing process, where authors gather information, generate ideas, and make a preliminary rough outline of what it is that they want to write about.

Such a stage considers the use of specific plans prior to the actual writing, as reported by Hyland (2003) when he says, “learners should be provided with a variety of ways of getting started in their writing and bringing it to fruition. This is perhaps most obvious with pre-writing activities” (p. 130). Gathering material and collecting information about content and structure are often achieved through setting idea-generating activities or simply pre-writing strategies such as brainstorming, freewriting, writing assertions, questioning, clustering, using the patterns of development, looping, and graphic organisers.

1.7.1 Brainstorming

Brainstorming is a creative pre-writing strategy that involves listing whatever comes to mind as quickly as possible. It is a strategy commonly used to produce a wide range of ideas, keywords, impressions, facts, thoughts, and concepts on a given topic or writing task. The major focus of brainstorming is quantity, with the attempt to generate a large number of ideas without initially evaluating or critiquing them (Johnson, 2008). Therefore, all ideas are welcomed and accepted without any selection between correct and wrong concepts. One characteristic feature of brainstorming is the use of a list of words or phrases (instead of a sentence) to capture and represent thoughts (Mcwhorter, 2010). Brainstorming is a focused activity that uniquely restricts writers to expand upon a specific topic and solely generate ideas relevant to that topic. This makes it different from freewriting, which encourages an unrestricted flow of thoughts. As with many pre-writing strategies, brainstorming is a task that can be performed either individually, or in pairs, as it can be carried out in groups where students build upon each other's thoughts.

1.7.2 Freewriting

Freewriting is another commonly used pre-writing strategy among students, writers, and professionals. As its name suggests, freewriting involves the deliberate effort to write everything that comes to mind, usually for an allotted period of time (e.g., 10 minutes). Following this strategy, the authors keep writing a string of sentences freely and continuously, without regard to editing the irrelevancies, even if what is written appears incorrect and disorganised (Brown & Hood, 2007; McWhorter, 2010). That is, the primary goal is to generate as much content as possible about the topic at hand, with less emphasis on correctness and grammatical, punctuation, spelling, and formatting errors. This permits the thoughts to flow naturally, just as they occur in the mind, regardless of whether students engage in freewriting using traditional pen and paper or a computer.

1.7.3 Questioning

Another way that can best work as a useful pre-writing strategy is questioning. Authors seeking this strategy have a strong drive to generate and collect content by asking a series of questions about the subject (e.g., who, what, where, and when). This helps them discover ideas and gather information, thereby guiding them to what they need to include in the text. More importantly, questions can stimulate critical thinking, resulting in a deeper exploration and understanding of the topic at hand. In such a manner, this strategy serves as an appropriate tool, particularly for analytical learners (McWhorter, 2010). Raising multiple questions before diving into the writing process helps to uncover new insights about the subject and explore it from multiple perspectives. It is for this reason that this pre-writing strategy can be versatile to be deployed for various writing purposes.

1.7.4 Clustering

Clustering has also been called mind mapping, idea mapping, or webbing. It represents a nonlinear brainstorming that is characterised by the flow of connections and the grouping of similar ideas. It is a process wherein the main concept, ideas, sub ideas, and supporting details are visually displayed, expanded, and shaped to form a web-like diagram (McWhorter, 2010). Clustering starts with the main topic or concept placed in the middle of the page after being circled or underlined. The writer should, then, think of more subsequent ideas related to the topic and rapidly place them in additional circles that relate to the central theme with lines to form a cluster of ideas (Steele & Steele, 1991). Clustering is particularly beneficial for generating a wide range of ideas, visualising possible relations, and establishing connections between concepts. Fundamentally, this strategy works better when the writer already has some knowledge or experience with the topic of the writing task. Generally, writers can use clustering with other pre-writing strategies, such as that when it follows brainstorming activities.

1.7.5 Researching

Conducting research on a topic is an important pre-writing activity that learners may need to use when the writing assignment or activity is about an unfamiliar subject or demands specified knowledge or facts. Collecting appropriate resources and materials is essential to back up ideas (McWhorter, 2010). Making research in the library or on the internet potentially reveals new perspectives, issues, and controversies. It has to be stressed that, for scientific integrity and rigour, writers must acknowledge other's work and maintain accurate references, providing credit to the original source of information.

1.7.6 Graphic Organisers

Graphic organisers, known as visual displays, are typically one of the most essential tools used in education for teaching and learning purposes. They are visual and spatial diagrams designed to manifest and clarify the connections between related ideas and concepts. These connections may be different in nature, being temporal, spatial, sequential, comparative, semantic, or hierarchic (Hughes et al., 2003). Overall, graphic organisers appear to help students improve organisational abilities and language skills. Upon pertinent literature, such tools have been proven to help understand complex relationships, acquire abstract concepts, and communicate main ideas (Dexter & Hughes, 2011; Forte & Schurr, 2001; Miller & Ann, 2023). Through the use of organisers, information can be structured in a comprehensible manner, following a specific pattern of organisation.

Above all, graphic organisers are thought to be effective tools that can help students in pre-writing, drafting, revising, and publishing (Meyer, 1995). According to Alber-Morgan (2015), visual organisers can help less skilled writers improve the skills of planning, organisation, word choice, and coherence. More importantly, they can assist students and writers to visualise and organise their thoughts and ideas before they begin writing. A review of the literature reveals many variations of graphic organisers that come in multiple forms and

types, each targeting a particular task. Some of the most prevalent types of graphic organisers cited in the literature are as follows: mind maps, flowcharts, Venn diagrams, t-charts, timeline charts, tree diagrams, KWL charts, cause and effect maps, story pyramid, spider maps, character maps, persuasion maps, problem-solution maps, sequence charts, hierarchy charts, main idea web, fishbone planner, hexagonal thinking, Cornell note-taking, story map, double bubble map, concept maps, and many of these.

1.8 Concept Mapping as a Pre-Writing Strategy

Concept mapping has recently gained ground as a versatile graphic organiser that may best work as a creative pre-writing strategy employed in outlining and planning written compositions or oral tasks. The use of concept mapping, as a graphic organiser, has been advocated and supported by several educators, under the framework of three cognitive learning theories (Lorenz et al., 2009).

- The dual coding theory describes that human brains represent and process information using two primary systems. One involves representing and encoding information verbally using language while the second operates non-verbally using mental imagery or visualisation. The combination of both verbal information and visual imagery leads to better learning and memory. This is easily achieved through the use of visual aids such as concept mapping.
- The schema theory suggests that our knowledge is organised and stored in the form of schemas. A schema is a mental representation that stores knowledge about the world (a specific object, person, or situation). In this connection, concept mapping provides a means of improving and maximising meaningful learning by activating learners' prior knowledge and schema and connecting them along with new information.

- Cognitive load theory describes the working memory as having a limited capacity for information processing; therefore, overloading it can impede effective learning. Concept mapping was credited with being useful in reducing the cognitive load and minimising the demands on students' working memory (p.118).

Concept mapping ranges from simple paper-based handwritten representations to elaborated computer-assisted maps. Despite this variation in complexity and form, such a tool is uniquely characterised by its distinctive hierarchical structure, which comprises a series of linked nodes (representing concepts or ideas) connected with labelled lines or arrows (representing connections between nodes) in order to form propositions (Novak & Cañas, 2015). Serving as a fundamental pre-writing planning tool, concept mapping intends to generate, lay out, and arrange key concepts and supporting details in a visual and logical framework that manifests how ideas are correlated.

1.9 Importance of Concept Mapping as a Pre-Writing Strategy

A wide spectrum of research studies has investigated and proposed the use of concept mapping for a variety of purposes across multiple educational fields and settings. Notably, however, there is a limited number of inquiries aiming to support its application as a pre-writing strategy that helps make the writing process more structured and organised (Al-Shaer, 2014; Flanagan & Bouck, 2015; Lee, 2013; Muhammad, 2015; Ojima, 2006). Concept mapping is, especially, helpful in the early stage of generating ideas and developing a preliminary plan for the work before the actual writing starts. The appropriate implementation of such tools in the pre-writing phase of the writing process results in considerable improvement in the writing performance of students by helping them maintain the correct sequential order of the text's content.

For the most part, concept mapping provides a visual representation of the central topic, making it easier for writers to visualise relationships, organise information, and connect concepts. By observing these relationships, authors can identify further areas or gaps that, in turn, stimulate the discovery and production of more new ideas for each sub-concept. In this way, the map expands into a more developed and detailed diagram. Flanagan and Bouck's (2015) inquiry indicated that there is no statistical difference between the mean scores of the participant students when using paper- or computer-based concept mapping to write compare-and-contrast essays. Principally, the quality of the students' essays was improved, particularly in respect of relevance, cohesion, and structure, regardless of the concept map form used.

Ojima (2006) carried out an inquiry, questioning the effect of concept mapping as a pre-task activity on three Japanese ESL learners' written performance and processes. Data were collected by means of retrospective interviews, logs, and questionnaires. It was found that the use of such a tool as a pre-writing strategy resulted in a significant improvement in learners' composition abilities and written production in terms of fluency and complexity. Similarly, these conclusions were also aligned with the results arrived at by Muhammad (2015) who found that the concept mapping experimental group outperformed his counterpart that initially taught following the conventional lecture-based method. He concluded that concept mapping could maximise Iraqi EFL college students' writing ability with regard to organisation, content, style, and quality of expression.

1.10 Common Writing Difficulties

The process of composing texts, whether simple or complex, is so complicated that novice or beginning writers find it a challenging experience. In fact, this can be the case for most native writers, who may also suffer from the complexities of the writing activity, thereby requiring formal instruction on writing skills. Writing in a second or foreign language is a rather more mentally and physically demanding task. This complexity is attributable to the multifaceted nature of writing as a skill, comprising a rich mix of a group of component skills and mental abilities that collectively interact with each other to help produce high-quality writing. Inefficiencies or infelicities in any of the constituent skills will likely distract meaning, resulting in lower-quality writing. The literature is replete with studies attempting to uncover the different failings and troubles of struggling writers (Alisha et al., 2019; Bai, 2016; Farooq et al., 2012).

Simply put, writing difficulties serve to describe the students who lack the necessary abilities to write in the manner expected of them (Solagha, 2013). In other words, writing difficulties simply represent the challenges and problems experienced by writers within the process of producing a written work. Some of the most common writing difficulties among writers are challenges in relation to content, organisation, mechanics, grammar, audience, purpose, word choice, language use, and the writing process. Bai (2016) manifests that learners' writing performance can be affected by little or no pre-writing planning, use of few writing strategies, problems in generating ideas, and little revision. Weigle (2002) delineates that the act of searching for relevant lexical and syntactic choices may hamper writing while Seely (1998) draws attention to the writing problem related to native language interference, Basturkmen and Lewis (2002) explain that ESL learners face constraints when writing academically in terms of enjoying the writing process, expressing themselves, and keeping the flow of ideas.

Al-Sawalha (2012) and Flower and Hayes (1981) agree that cognitive overload can further affect the writing process by impeding the generation of ideas, on the one hand, and maintaining their relevancy and order, on the other hand. Therefore, they suggest the use of writing strategies as to reduce cognitive demands while composing. Mohammad et al. (2020) study adds to the above-mentioned writing difficulties other items such as the lack of ideas, lack of teacher's help, lack of materials for consulting unsuitable methods of teaching writing, lack of assessment rubrics, topic inappropriateness, and time restriction. The above-cited studies indicate that writing difficulties are not exclusively limited to one specific category. As a consequence, providing targeted support for struggling writers and addressing their writing challenges involves identifying the specific factors that can contribute to and lead to writing difficulties.

1.11 Factors Affecting Writing Performance

Student performance in the area of writing is dynamic and changing, being affected by several variables of different nature. In this vein, and although they are scarce, some research studies have sought to investigate and uncover the set of determinants influencing writing in pursuit of helping writers control them and foster their writing abilities. According to the results of their study, Vacalares et al. (2023) identify learners' motivation, classroom environment, reliance on writing applications, and feedback system as the factors that cause difficulties in English writing. Dema' (2022) study finds that intrapersonal, interpersonal, and institutional aspects all had an impact on students' writing abilities. For the same purpose, Herdi (2015) maintains that there are six factors affecting writing performance namely, classroom management, teacher's strategy, teacher's approach, classroom activities, materials, and media.

In the same way, and following the analysis of the study data, Alharthi (2018) indicates that English writing strategies, L1 writing proficiency, motivation, writing anxiety, teaching methods, curriculum, and past learning experiences are among the contributing factors to writing difficulties. The a forementioned investigations imply that writing performance can be significantly influenced by factors correlated with writers, teaching practices, and context. Such aspects affect strategy usage, the component elements of the writing process, or the way thoughts and ideas are conveyed, thereby impacting the quality and accuracy of the resulting written work. To produce successful and meaningful written communication, writers need to frequently take into account and control these variables.

Conclusion

The present chapter attempted to reveal concerns about understanding the skill of writing, with special attention given to its definitions, component elements, and stages. Not only did it address language learning strategies and their taxonomy, but it also portrayed the most prevalent and widespread writing and pre-writing strategies. Most importantly, the effective and vital role of the concept mapping pre-writing strategy was described and displayed. The chapter was further concerned with eliciting information on potential struggles or challenges experienced by writers within the process of composing texts, along with the contributing factors leading to difficulties in English writing. The subsequent chapter will be directed at providing a detailed description of Novakian concept mapping, covering its categories, components, and usage.

Chapter Two: An overview of Concept Mapping

Introduction

2.1 Introduction to Graphical Displays

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2.8.6 Concept Mapping for Academic Achievement

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2.8.8 Concept Mapping for Assessment and Evaluation

2.8.9 Concept Mapping for Brainstorming and Note-Taking

2.8.10 Concept Mapping for Conducting Research

2.8.11 Concept Mapping: Theory and Practice

2.9 Concept Mapping Assessment and Scoring Rubric

Conclusion

Introduction

The present chapter will try to focus on providing a substantial description of Novakian concept map to be able to get an in-depth understanding of its applications and uses. To address this concern, the chapter begins with an overview of graphical displays, their categories, and their value. It, then, portrays the connection between graphical displays and concept mapping, explaining it as a representational tool that records, organises, and conveys information graphically. To explain, the chapter goes on to describe the concept map, its types, components, and scoring rubric, along with the process and instructions followed to generate a systematic and focused diagram. A wide-ranging account of the emergence of the concept mapping theory is also provided. To better understand the uniqueness of the concept map, mind mapping is also brought into discussion. Likewise, the applications of instructional concept maps in educational contexts are documented, with evidence from relevant existing studies in the literature.

2.1 Introduction to Graphical Displays

Graphical displays, which can also be addressed as graphical organisers or knowledge graphs, are education and learning tools for structuring and arranging ideas related to a topic. They allow the externalisation of conceptual and relationship knowledge of a domain in a form of graphical representation that shows the connections between facts and concepts (Kalmamatovam et al., 2020). There is a growing need to use such tools in a variety of disciplinary contexts and educational settings, as they have been repeatedly demonstrated to have a positive impact on the quality of teaching and learning. To address this concern, graphic organisers can be employed as activities for pre-teaching, introducing a topic, teaching a topic, independent learning, study and revision, and preparing answers to examination questions (PDST, 2016).

The application of graphical displays to foster engagement, autonomy, understanding, attention, organisation, and retention is well-entrenched across the literature. This is thought to be viable for helping students gain more control over their learning (Kalmamatovam et al., 2020). Since they are forms of expression, graphic organisers have a promising effect on generating ideas, sequencing information, and structuring content (Qi & Jiang, 2021). They draw students' attention to important concepts and conceptual relationships, enabling them to develop the skills to reduce the complexities of information overload.

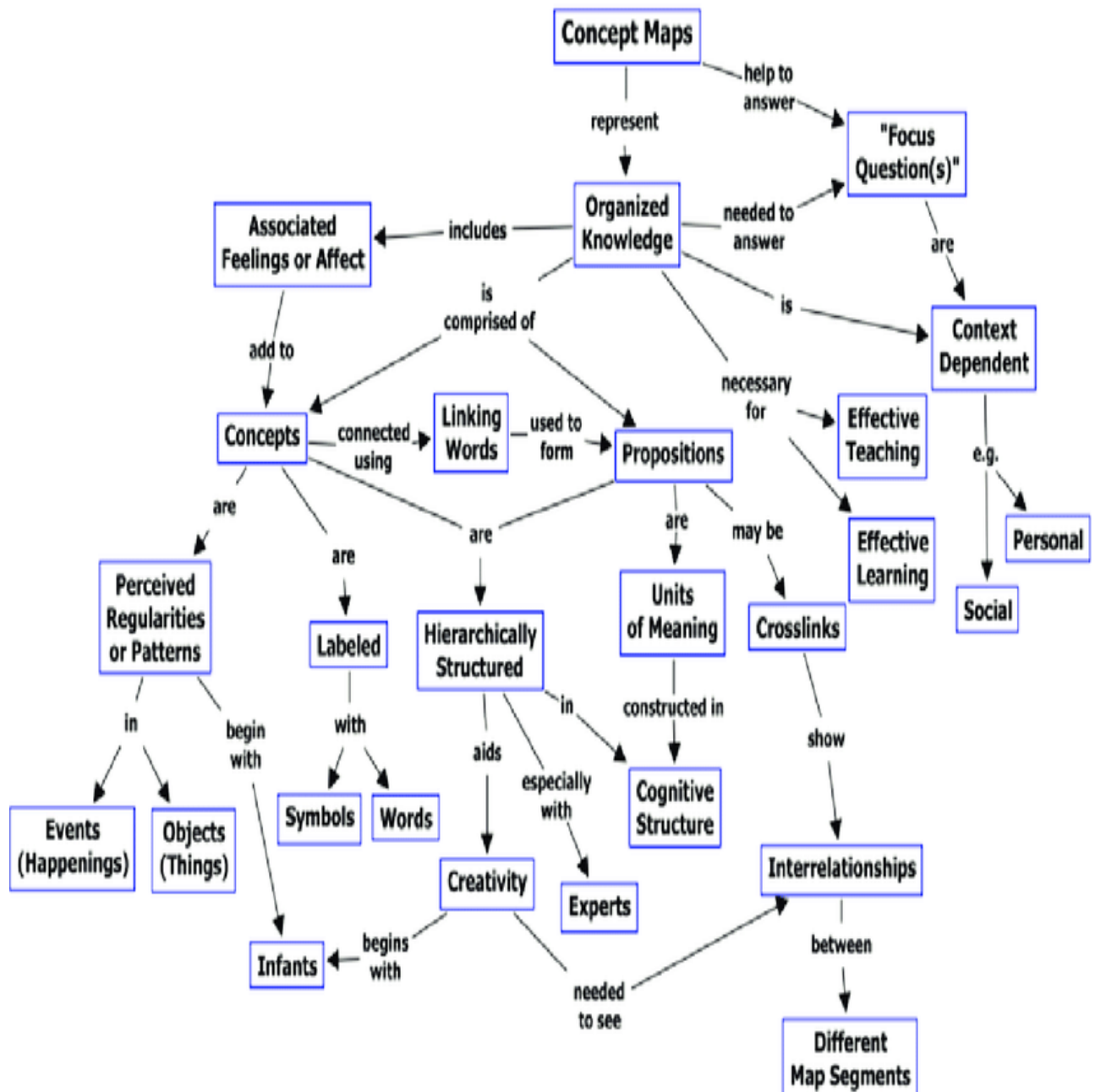
In this respect, depending on the purpose of the activity, graphic organisers come in different forms and shapes. To clearly visualise content, numerous diagrams are used to typify graphical displays, such as story maps, timeline charts, mind maps, biography graphic organisers, KWL charts, problem-solving organisers, double bubble maps, flow charts, tree diagrams, sequence charts, Venn diagrams, concept maps, and more. As an educational tool, concept mapping has recently gained ground, and its efficacy has brought it into the limelight.

2.2 Understanding Novakian Concept Mapping

A Novakian concept map is a representational tool that records, organises, and conveys information graphically. It is one of the teaching and learning visual displays that potentially helps explain bodies of knowledge in explicit and concise words (Cañas & Novak, 2015). This mind tool demonstrates the relationships and connections between various ideas, concepts, and elements belonging to the same theme or topic. It is commonly constructed to answer a question called the focus question. In the form of a network, a concept map consists of a series of linked concepts connected with labelled lines, thus forming propositions. Novak and Gowin (1984) maintain, “a concept map is a schematic device for representing a set of concept meanings in a framework of propositions” (p. 15). In this respect, the basic properties and components forming this diagram are the focus question, propositions, concepts (also called nodes), linking words, and links /cross-links. Figure 2.1 displays the key features of a concept map.

Figure 2.1

A Concept Map Representing the Structure and Characteristics of Concept Maps



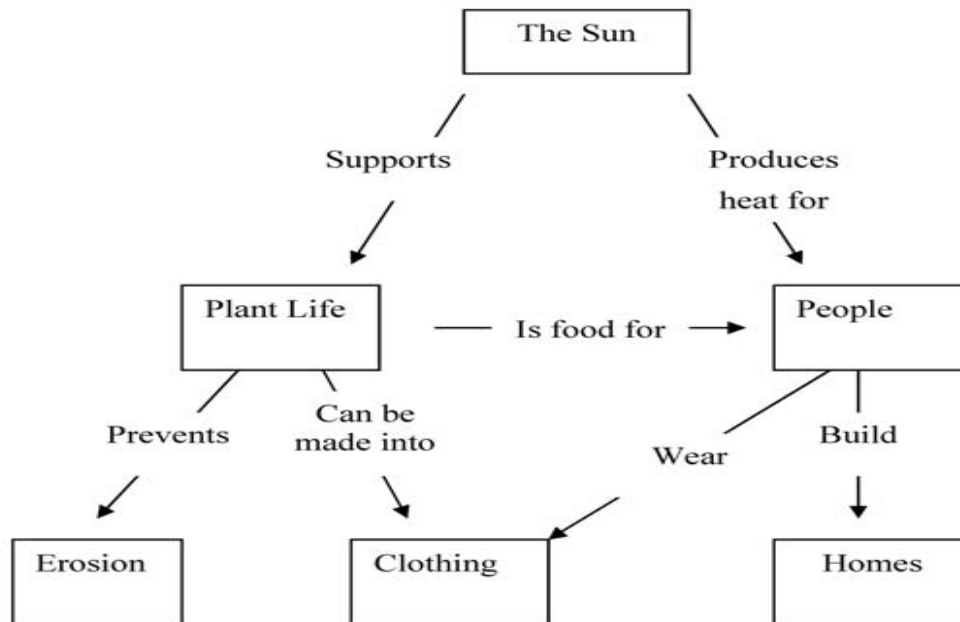
Note. From “The Theory Underlying Concept Maps and How to Construct Them”, by J. D. Novak, and A. J. Cañas, 2015, p. 2.

To explain, a proposition is made up of two or more concepts and a linking description to form a meaningful statement or a unit of meaning. Concepts, which are perceived as subjects, objects, or events, are designated by words, pictures, symbols, formulas, etc (Novak & Cañas, 2015). They may represent brief descriptions or definitions, often included in shapes (usually circles or boxes). Concepts are arranged and organised systematically and in descending order of importance or specificity (Novak & Cañas, 2015). That is, the most important or general concepts are listed at the top, while the least inclusive and most specific are at the bottom, forming a hierarchical tree structure. The focus question, which guides the development and direction of the map, is defined as the central theme, idea, or question around which the concept map is being built.

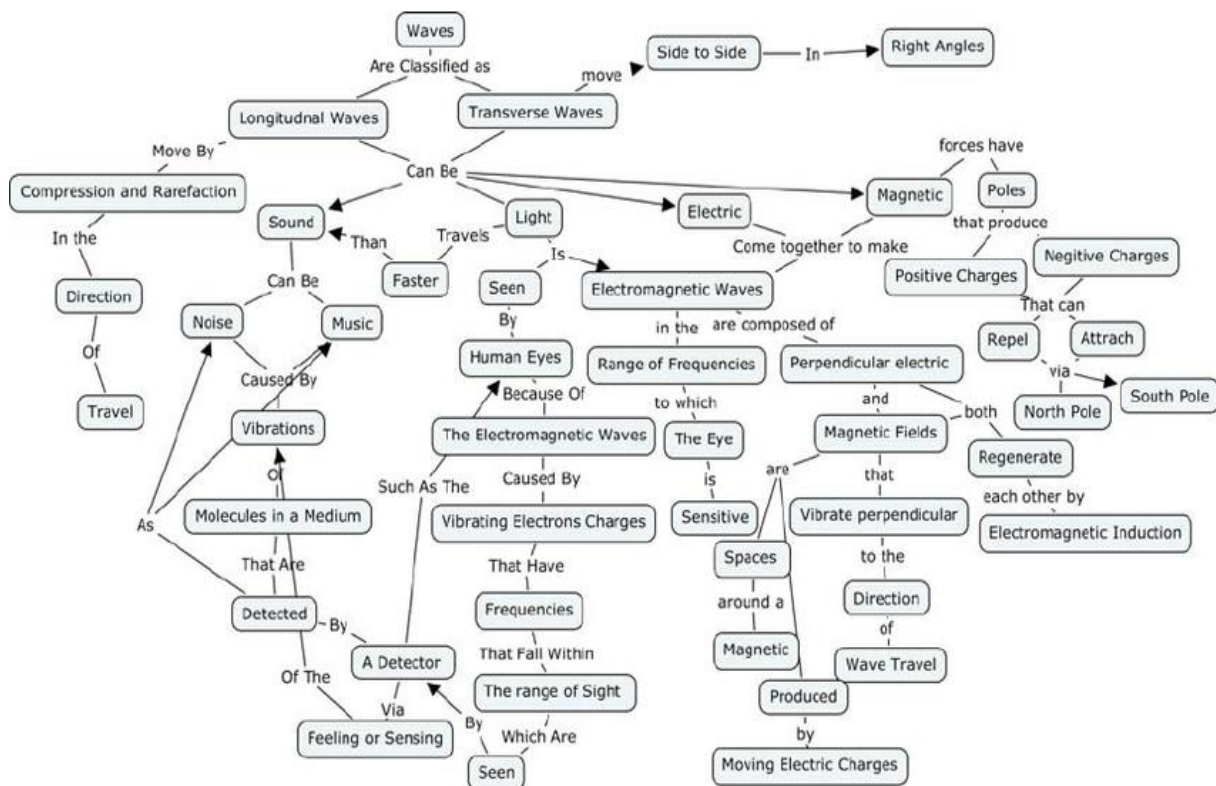
Links, or crosslinks, are connection lines or arrows that permit the visualisation of the interconnection between concepts. Linking words/phrases, which can be verbs, adverbs, phrasal verbs, or prepositions, are distinctive connective terms placed on the lines to clearly specify the nature of the conceptual relationship (between and among concepts). The inclusion of examples in the concept map is thought to help clarify the meaning of some concepts (Novak & Cañas, 2015). In particular, since they do not represent concepts, the examples should not be enclosed in circles or boxes. To illustrate, simple and complex concept maps are demonstrated in Figures 2.2 and 2.3, respectively.

Figure 2.2

An Example of a Simple Concept Map



Note. From “Framing Experience: Concept Maps, Mind Maps, and Data Collection in Qualitative Research”, by J. Wheeldon and J. Faubert, 2009, *International Journal of Qualitative Methods*, 8(3), p.70, DOI: 10.1177/160940690900800307

Figure 2.3*An Example of a Complex Concept Map*

Note. From “Concept Mapping in the Teaching of Physical Science: Assessment of Real World Applications of Wave Energy by Pre-Service Teachers Negotiating Concept Understanding”, by S. Himangshu, 2012, *Concept Maps: Theory, Methodology, Technology*, p. 6.

2.3 Kinds of Concept Maps

There is a limited research base on the types of a concept map. Some categories are available under names such as linear, circular, tree, systems, hierarchy, flowchart, and spider (Strautmane, 2012; Yin et al., 2005). Nevertheless, the most commonly agreed upon taxonomy is that proposed by Ian Kinchin in 2000, which embraces three morphological types. The structures are denoted as ‘spoke’, ‘chain’, and ‘net’. This framework is characterised by its simplicity, as it is thought to help teachers develop scoring rubrics for concept mapping analysis.

2.3.1 Spoke-Type Maps

The most fundamental type of the three structures is the spoke graphical structure. In general terms, it is uncomplicated, with a one-level hierarchy and simple links (Kinchin et al., 2000). Primarily, all the related concepts of the topic are directly linked to the root idea but not directly associated with each other (neighboring concepts) (Ullah, 2020). That is, the key to this structure is the absence of cross-linkages. Therefore, adding or deleting any subordinate concepts will not cause any disturbance, thereby maintaining the overall existing meaning or structure.

2.3.2 Chain-Type Maps

Another category of the scheme is the chain-type map. Like a chain, this type comprises a series of concepts listed from the broadest to the most focused. In a linear and logical sequence, single concepts are only associated with those items directly above and below (Kinchin & Alias, 2005; Ullah, 2020). It is inflexible, meaning that any change in concepts or links may likely make the entire structure nonsensical and invalid. Therefore, the mapper will have to consider restructuring the whole map. Given that the chain structure frequently depicts the same sequence and order in which concepts were delivered in the lecture, it can be typically conceived as a sign of rote learning.

2.3.3 Net-Type Maps

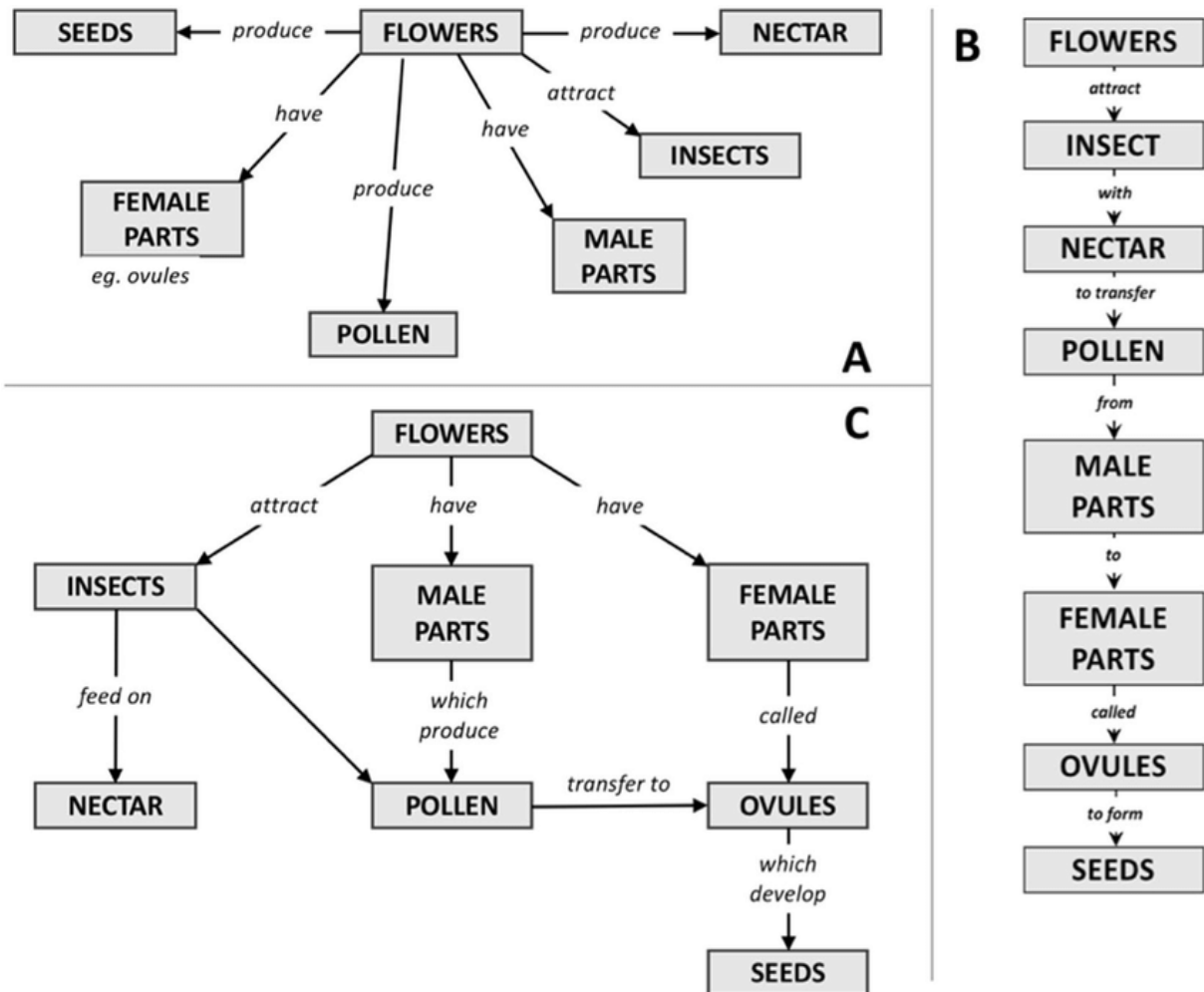
The third concept map type is the net. Concepts are arranged in descending order from the most general to the most detailed, just like the previous two concept map categories. Particularly, however, the branches are what distinguish net-type maps (Kinchin & Alias, 2005). Branches can be found on every level of the net. Nets comprise several hierarchies and interconnections to form a network, thus coming to be called a net-shaped map. Notably, multiple highly integrated levels and links are manifested, and each concept can be conjoined

with any item at any level on the map (Kennedy-Jones et al., 2015). With this in mind, the net is deemed the most complex and interactive type of concept mapping.

As a matter of fact, such a structure is characterised by its flexibility in accommodating change (Ullah, 2020). Accordingly, the general structure is unaffected by the addition or deletion of concepts. In light of its features, the net-type map is often indicative of meaningful learning, thereby demonstrating a deep understanding of the topic. It should be noted that each of the concept map types is highly indicated by concept-related knowledge. If the mapmaker has a shallow, moderate, or deep understanding of the topic, s/he will likely end up generating a spoke, chain, or net, respectively. Besides, each type plays a pivotal role in framing students' learning. As students' comprehension and learning develop, one structure may evolve and change into another one over time, such that a spoke structure may turn into a chain or a network. Figure 2.4 represents the three main types of concept mapping.

Figure 2.4

The Three Main Concept Map Structures



Note. From “How a Qualitative Approach to Concept Map Analysis Can Be Used to Aid Learning by Illustrating Patterns of Conceptual Development”, by I. M. Kinchin, D. B. Hay, and Adams, A., 2000, *Educational Research*, 42(1), p. 47. Copyright 2000 NFER.

2.4 Development of Instructional Concept Maps

In 1972, at Cornell University, concept mapping was designed and proposed in the course of Novak's research program. The latter, which was later published in nine languages, originally strived to track and comprehend changes in children's conceptual knowledge of science. Nevertheless, the researchers found it challenging to collect data and specify children's understandings of scientific concepts by means of examining interview transcripts. This obstruction encouraged Dr. Novak to find a new assessment tool through which the degrees of conceptual understanding can be easily and practically tracked over time (Novak & Cañas, 2015). This gave rise to the Novakian concept map, which, since then, has become a well-established technique that fosters learning and teaching.

Concept mapping is grounded in David Ausubel's Assimilation Theory of meaningful learning (1963) and constructivism theory. Ausubel stresses the interaction of new ideas with past experiences possessed by learners. Simply put, the fundamental idea in this theory is the conscious assimilation of newly acquired information with already-known pre-constructed cognitive structures (Novak & Cañas, 2015). This gave rise to the psychology of meaningful learning, which has long been differentiated from rote learning, being based solely on memorisation and repetition. Unlike rote learning, meaningful learning rests on the premise that effective and successful learning occurs when actively connecting and relating new concepts or propositions to relevant prior concepts or propositions, resulting in a structured and hierarchically organised framework of knowledge in a domain.

The key to Ausubel's theory is the idea of subsumption. In simple terms, subsumption means that more detailed concepts are embodied and subsumed under more general ones. Another theory underpinning concept mapping is constructivism, which posits that learning is a dynamic and active process of knowledge construction and reconstruction (knowledge is not discovered but created). In this connection, learners' active engagement in the learning process,

their feelings, past experiences, and thinking are particularly important for knowledge creation (Novak, 1998, as cited in Tajeddin & Soudabeh, 2016). Within this framework, and to operationalise the principles of both theories, concept mapping was created as a visual thinking tool to present and structure conceptual information by actively drawing and showing meaningful connections between concepts and ideas.

2.5 Concept Map Creation and Process

Concept mapping is a way of organising, exploring, and expanding knowledge and understanding of a topic. With this in view, having students construct such a visual organiser will help identify misconceptions and recognise gaps in knowledge. This is simply because concept mapping visually represents cognitive knowledge structures. Importantly, and although there is no specific predetermined set of rules for concept mapping creation, Novak and Cañas (2015) highlight some guidelines for generating good concept maps. Initially, and to avoid text-heavy and unfocused maps, it is necessary to start with a central concept or a focus question before branching out to superordinate and subordinate parts. The focus question specifies the issue addressed in the map, and it can be a study topic, a research question, or a business problem.

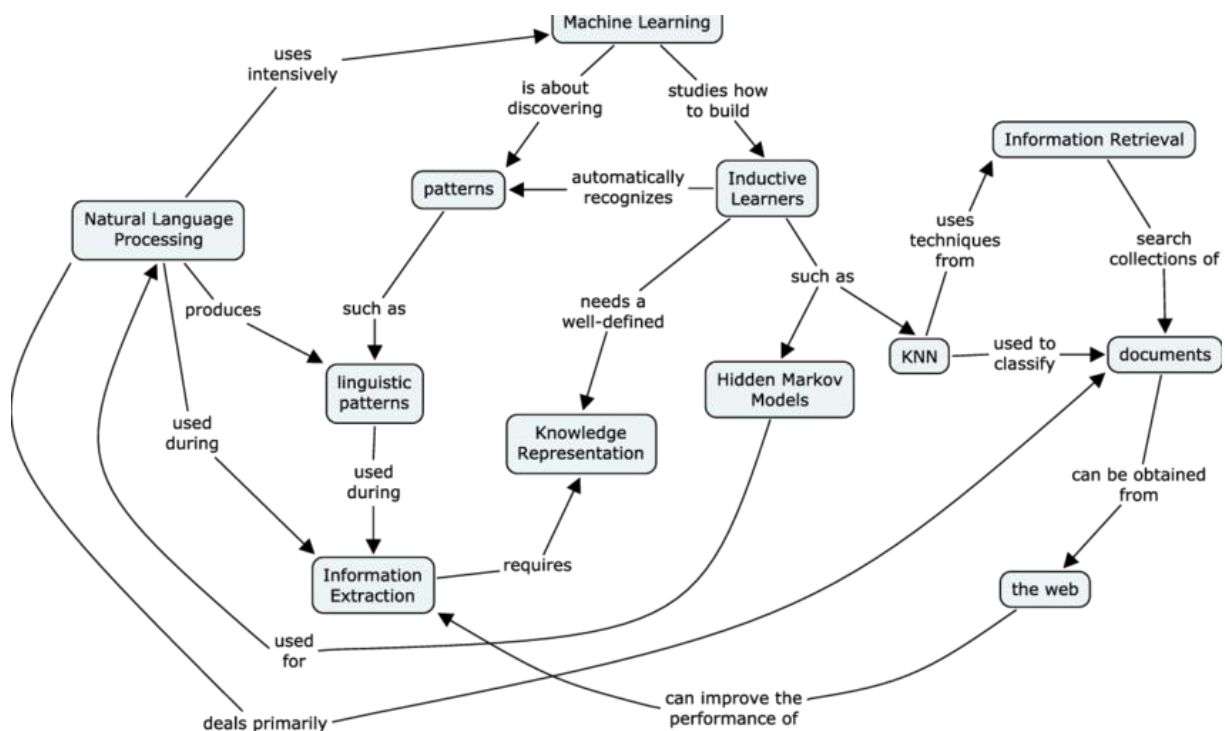
In a list called the parking lot, the concept builder should list out and brainstorm all the ideas and concepts that may fall under the main concept and potentially help answer the focus question. It usually comprises around 15–25 concepts. Concept maps are then constructed by actively picking the relevant items from the parking lot, placing them progressively from top to bottom to form a hierarchy, tying them together with links, determining the direction of the arrows, and adding adequate linking words written along the lines. It should be pointed out that there is no a limited array of linking words (Novak & Cañas, 2015). Therefore, any explanatory phrase/word can be chosen as long as it elucidates the true interrelationship

between concepts and forms an expressive proposition. By way of illustration, the linking words might be 'leads to', 'caused by', 'results from', 'because of', and 'is part of'.

The concept map is never finished. As knowledge expands, and to reflect a better understanding of the topic, the concept map needs to be constantly revised and updated. For the most part, some concepts can be added, moved around, or even taken away. In this regard, there is no one common or formal skeleton for the concept map to be correct. To clarify, although relying on the same focus question, people are more likely to draw differently structured concept maps. This is illustrated by Kinchin et al.'s (2000) statement that, "the structure of a map is unique to its author" (p. 44).

2.6 Computer-Assisted Concept Map

Concept maps have been predominantly constructed using paper and pencil or chalkboard. With the growth of technology, several digital education tools and applications have been created, thereby introducing new possibilities for effectively creating computer-generated concept maps. Such programs and platforms as Cmap Tools, FreeMind, MindMup, Mindomo, Inspiration, and Bubbl.us have evidently yielded potential benefits (Aşıksoy, 2019). Not only do computer-assisted tools facilitate concept map construction, but they also support concept map revision and modification (Ban Shihab, 2020). Cmap Tools, for instance, is a highly flexible tool that allows users to automatically shape and restructure maps by adding, correcting, changing, rearranging, or deleting nodes or links. To exemplify, Figure 2.5 portrays a concept map generated by Cmap Tools.

Figure 2.5*A Concept Map Generated by Cmap Tools*

Note. From “Automatically Associating Documents with Concept Map Knowledge Models”, by A. Valerio, D. Leake, and A. J. Cañas, 2014, *Connecting Educators: Proceedings of the Third International Conference on Concept Mapping*, p. 3.

Compared to hand-drawn maps, computerised concept maps can best be easily shaped in terms of colours, lines’ types, background images, fonts, and text alignments. Computer-generated concept maps can possibly be linked to other maps, saved, and exported into different file formats (Baylen & D’alba, 2015)). They can also be shared and published digitally so that anyone can easily access them. It is important to note that software systems also enable collaboration in the construction of concept maps, allowing concept mappers to track changes as their projects develop (Moon et al., 2011; Novak & Cañas, 2015). In this case, participants

may be in the same room or from distant locations and concept mapping building may be synchronous or asynchronous.

Computer- based tools are even better in that they permit to hyper-link diagrams, therefore, adding link resources (photos, videos, charts, texts, web pages, or notes) to their maps. This process makes it possible for mappers to delve deeper into the content and further explain complex concepts and relationships. Because of its efficacy, computerised-concept mapping has been subjected to empirical evaluation (Aşıksoy, 2019; Chang et al., 2001; Chang et al., 2016; Chiou et al., 2020; Hassanzadeh et al., 2021; Liu et al., 2010).

2.7 A Comparison of Concept Maps and Mind Maps

The idea of translating complex ideas into visual-graphical diagrams is not new. For example, dating back to 1972, flowcharts were created. Even more importantly, pie charts date back far further (Davies, 2010). The need for developing additional easy-to-understand visual mapping tools has become progressively greater. Variants of these tools are 'mind maps', 'argument maps', 'evidence maps', 'knowledge maps', and 'concept mapping. It is critically important to note that concept mapping has been created to address the limitations of mind mapping (Davies, 2010). It is sometimes hard to differentiate between them that, in many sources, they are often used interchangeably. Nevertheless, the features of the concept map set it apart from all visual tools.

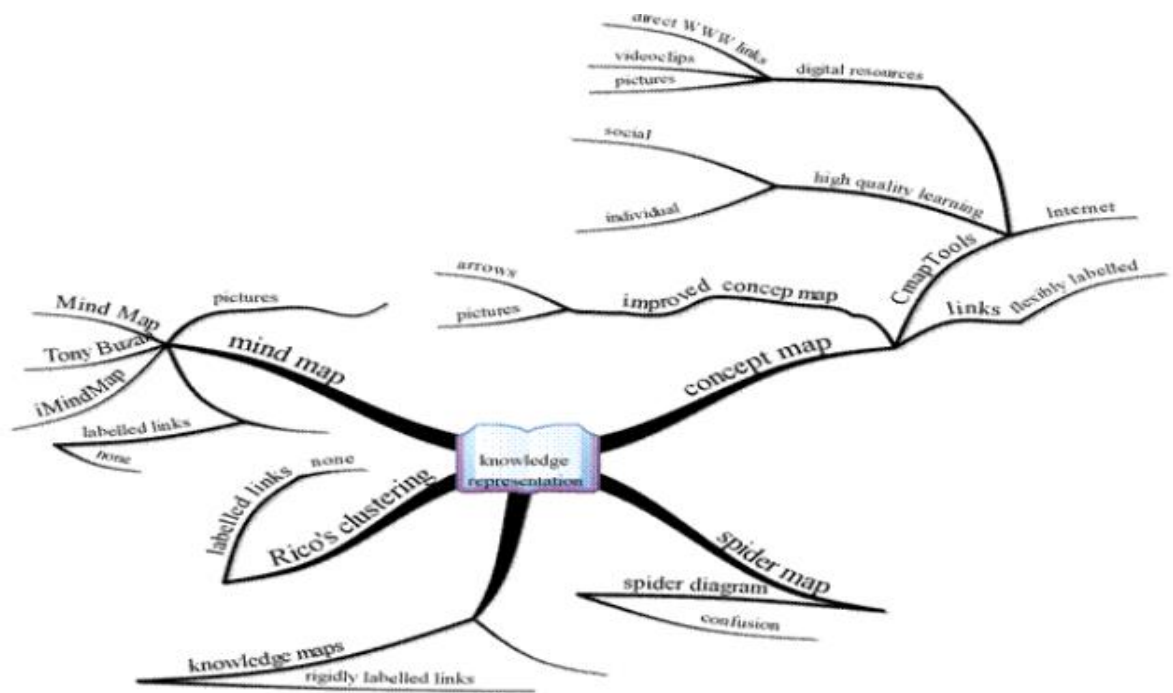
The overriding feature of concept mapping and mind mapping is visualisation. Both tools use the visual illustration of relationships among items. Diagrammatic relationships take precedence over textual or verbal descriptions (Davies, 2010; Eppler, 2006). In addition, the major and minor ideas radiate from a focal point, resulting in a network of connected ideas. Nevertheless, concept mapping is unique by its propositional nature and linking words. Clearly, unlike mind maps, concept maps stress the relationships between the connected concepts.

Even more importantly, the two tools are distinct in terms of structure, precision, and level of formality. To explain, mind maps, which were developed by Tony Buzan in the late 1960s, are particularly known for their loose and unconstrained structure with a simple layout that prompts the integration of pictorial flourishes, shapes, codes, line thicknesses, and colours (Almulla & Alamri, 2021; Davies, 2010). That is, they are often described as being personal, simple, and flexible, often with many one-to-one relationships among ideas. Contrastively, concept maps are more logical, precise, and formal, used primarily to accomplish pedagogical tasks. They are more structured, with a complicated layout (Almulla & Alamri, 2021; Davies, 2010). They do not support the use of pictures and colours and usually portray many-to-many relationships between concepts.

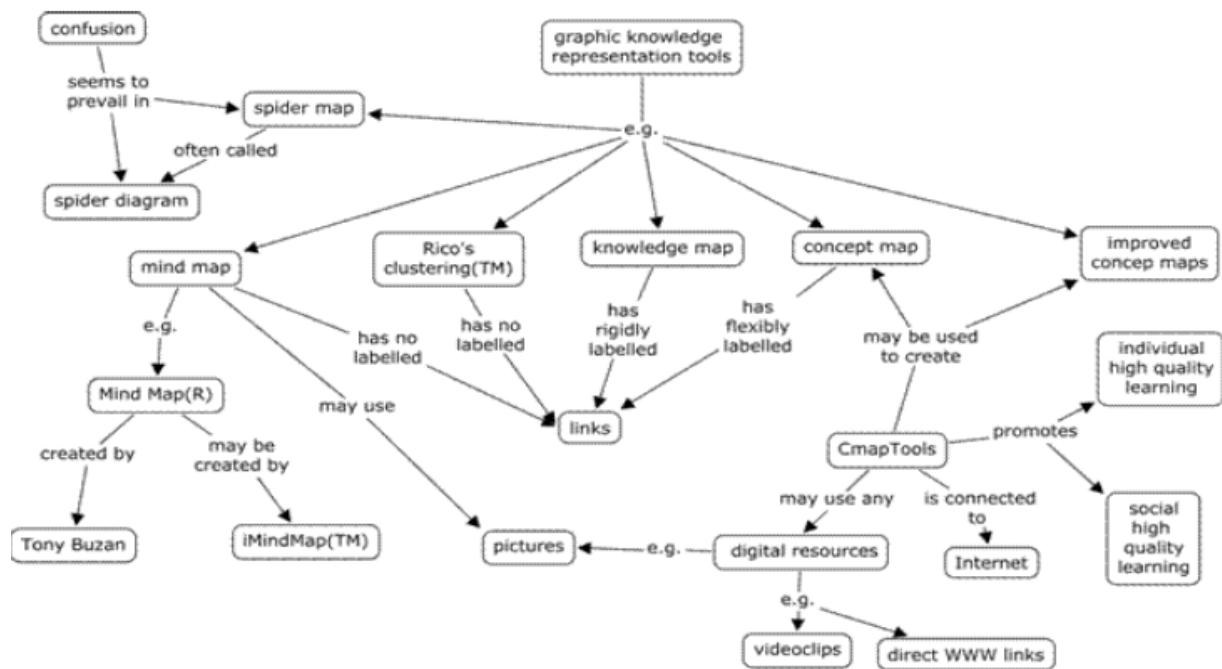
The difference between mind mapping and concept mapping is also at the level of function and purpose. It is worthwhile noting that even though both diagrams facilitate the understanding, remembering, analysis, and retrieval of information, mind mapping is well suited for visual notetaking and brainstorming. It, therefore, seeks to produce spontaneous associations (Eppler, 2006; Kommers, 2022). Concept mapping, on the other hand, is a knowledge representation tool that is best known for outlining and specifying the nature of relationships between concepts, thereby clarifying the concepts themselves. To better visualise the difference between both graphs, a concept map and a mind map were generated to explain the same subject matter (knowledge representation), as represented in Figures 2.6 and 2.7, respectively.

Figure 2.6

A Mind Map Representing Knowledge Aspects



Note. From “Concept Mapping as an Empowering Method to Promote Learning, Thinking, Teaching and Research”, by M. Ahlberg, 2013, *Journal for Educators, Teachers and Trainers*, 4 (1), p. 28.

Figure 2.7*A Concept Map Representing Knowledge Aspects*

Note. From “Concept Mapping as an Empowering Method to Promote Learning, Thinking, Teaching and Research”, by M. Ahlberg, 2013, *Journal for Educators, Teachers and Trainers*, 4 (1), p. 28.

2.8 Values of Concept Mapping in Education

As a cognitive tool, concept mapping reflects the underlying knowledge structures, therefore demonstrating the understanding of a subject or a domain. It is for this reason that several researchers have viewed it as a successful educational tool and a good addition in a variety of fields. In this respect, the current section avers that concept mapping can be beneficial in a number of different areas, including teaching, learning, reading, writing, speaking, listening, achievement, curriculum and lesson planning, assessment and evaluation, brainstorming and note-taking, conducting research, and integration between theory and practice.

2.8.1 Concept Mapping: A Strategy for Teaching

There has been significant interest among scholars in the educational use of concept maps for teaching purposes. They can be used differently in a number of varied applications to enhance the teaching quality. Fundamentally, they can be incorporated in the development of course design, midterm and final course reviews, as they can be part of introductory units (Croasdell et al., 2003). Concept mapping is a methodology that can be used by instructors not only to arrange their all-important thoughts before lessons but also as an instrument for delivering complex course contents and simplifying new materials (Hay et al., 2008). On this basis, teachers can design and introduce detailed expert maps so as to share and explain content knowledge in an ever-simple and effortless way, therefore, drawing students' attention to key ideas and relevant associations.

Literature notifies that the concept mapping strategy can also act as an assessment tool for the quality of learning. To explain, it provides a general overview of students' existing knowledge along with their newly constructed cognitive structures, thereby making their learning progress visible (Hay et al., 2008; Croasdell et al., 2003). To explain, teachers can document and gain insights into students' prior knowledge and emerging knowledge just by reviewing students' maps. This allows them to uncover and fathom valid understandings, complexities, gaps in understanding, and misconceptions students hold, thereby revealing what knowledge students found difficult to acquire and what course goals failed to be achieved.

2.8.2 Concept Mapping: A Strategy for Learning

Concept mapping is used most commonly as a learning tool. Numerous educational studies have emphasised the fundamental role of instructional concept maps in yielding positive impacts on the quality of student learning. Examples of such researches are (Erdoğan, 2016; Maree et al., 2012; Marriott & Torres, 2016; Sivaraman, 2020). For learning purposes, the Novakian concept map can potentially be used to accomplish tasks as varied as organising

knowledge, generating ideas, activating prior knowledge, taking notes, exam revision, and planning studies and term projects. Because of its hierarchical tree structure, the concept map has been accepted as an organisational method for it helps to systematically arrange conceptual and relationship knowledge in a form of diagrammatic representation. Principally, concept mapping is commonly viewed as a knowledge construction and representation device. As a form of expression, it has a promising effect on generating ideas and sequencing them from the most general to the most specific, therefore, drawing students' attention to major concepts and conceptual relationships.

Because of it being an instrument for building relevant associations among concepts, concept mapping serves to integrate existing content and newly acquired elements. This may help students to be self-directed and active participants in the process of meaning creation and knowledge construction. On this basis, they assimilate new content into relevant prior knowledge, thereby fostering meaningful learning and limiting rote learning (Hay et al., 2008). As a visual organiser, and when created systematically and correctly, concept mapping can be a successful note-taking strategy that associates relevant concepts in a non-linear sequence (Machado & Carvalho, 2020). Since it promotes the understanding of topics and encourages the acquisition of information, concept mapping can also act as an exam preparation and revision tool, which may result in improved achievement and high performance.

2.8.3 Concept Mapping for Reading Purposes

Reading comprehension is a dynamic and multi-componential language skill whose benefits are identifiable in most academic contexts. It is complex, requiring an interaction among the print, vocabulary knowledge, language structures, verbal reasoning, background knowledge, and literacy knowledge. The fact that it is cognitively demanding has encouraged scholars to propose supportive tools, such as concept mapping, to boost comprehension skills and support struggling readers. The efficacy of concept mapping on reading ability has been

recognised and documented in several studies (Beydarani, 2015; Henouda & Hoadjli, 2022; Liu et al., 2010; Lumontad et al., 2020; Khajavi & Ketabi, 2012; Usman, 2017).

An investigation carried out by Liu et al. (2010) on a group consisting of one hundred ninety-four freshmen who, based on their English proficiency, were divided into low-level and high-level groups. Experimental and control groups were also constructed based on subjects from both level groups. Originally, this study sought to investigate the effects of computer-assisted concept map on EFL college learners' English reading comprehension. It was found, after applying the two-way ANOVA analysis and independent sample t-test analysis, that the learning strategy applied was more beneficial for the low-level group compared to the high-level group. Further, it was also observed that other English reading strategies (listing, enforcing, and reviewing) were improved through the use of concept mapping.

In a similar vein, Henouda and Hoadjli (2020) sought to uncover the extent to which concept mapping works on improving the reading comprehension of 26 master students. The research findings of the paired sample t-test revealed that this visual tool yielded positive outcomes with regard to the comprehension of passages. Similarly, with the aim of uncovering the connection between the reading ability and the use of concept mapping, another quasi-experimental study was conducted at Asian College of Technology by Lumontad et al. (2020). Methodologically, two groups serving as the experimental and control groups were formed. Data analysis suggested that the incorporated tool significantly influenced learners' reading comprehension skills, with a noticeable improvement in students' analytical, structural, and creative skills.

The practicality of the concept mapping strategy is noticeably reflected in the above-mentioned research studies. It was conducive to the summarisation of the text's ideas and the grasping of its big picture (Henouda, 2020; Riahi & Pourdana, 2017). Principally, to maximise reading productivity, it is indicated that this tool can also be advantageous in stressing the focal points of the text, decreasing the probability of forgetting its content. It has also been shown that this strategy can potentially decrease reading difficulties by contributing to the activation of background knowledge, emphasis on text structures, and enhancement of relational understanding.

2.8.4 Concept Mapping for Writing Purposes

Concept mapping has been proven to draw salutary outcomes in respect of writing quality. Above all, there are significant learning gains when concept maps apply to writing tasks (Al-Shaer, 2014; Lee, 2013; Negari, 2011; Nobahar et al., 2013; Rahman & Ambreen, 2018; Wan Azlinda & Badrul, 2008). Negari (2011) reported using concept mapping to promote the writing performance of nighty EFL learners. Following the pretest-posttest control group design, the experimental group was accordingly primed to write multiple expository essays using the predetermined strategy. Basic statistical measures revealed that the explicit instruction of concept mapping positively affected their ability to write essays.

Similarly, Nobahar et al. (2013) intended to explore the practicality of concept mapping on 60 Iranian intermediate EFL learners' self-efficacy and expository writing accuracy. Unlike the control group, which received regular classroom instruction, the treatment group was particularly exposed to concept mapping as a pre-writing strategy. It was indicated, through varied statistical tests, that the integration of such a strategy could potentially maximise EFL learners' self-efficacy and advance their expository writing ability. Another investigation was carried out by Lee (2013) who, with the aim of examining the efficacy of collaborative concept mapping in L2 writing, purposefully recruited 123 participants.

The study findings indicated that the concept map can be a powerful tool in assisting writers in the planning stage and in reducing attentional overload in the writing task. Nevertheless, it also emphasised the fact that the collaborative concept map did not result in much improvement in L2 writing compared to individually constructed concept map. In the same manner, Pishghadam and Ghanizadeh (2006) carried out an inquiry questing for the practicality of concept mapping with regard to learners' writing ability. In the pre-writing phase, the experimental group was guided to use concept mapping, which was the fundament for organising the written essays. As hypothesised, the researchers found that the use of such a visual organiser resulted in a significant improvement in the writing proficiency of learners belonging to the experimental group.

These conclusions were aligned with the results arrived at by Al-Shaer (2014) who worked with 38 participants to delve into the relationship between concept mapping and the capacity to compose argumentative essays. In this connection, and for the pre-writing phase, the experimental and control groups were restricted to utilise concept mapping and the textbook, respectively. The results manifested that the experimental group generated the best argumentative essays in respect of organisation, coherence, unity, and arguments. In addition, the findings of Mohamed and Badrul (2008) reported that the concept map disclosed further details that needed to be included in the essays. They also revealed that it was until they employed the tool that they could typically relate the content to each other and to the other sections in the text.

A further investigation, and in an attempt to investigate how supportive concept mapping is in improving students' expository writing, Rahman and Ambreen (2018) conducted an experimental study with a pretest-posttest control group design. Forty students were equivalently assigned to two groups. To explain, the experimental group received the concept mapping-related treatment following a period of six weeks before they were asked to compose

ten expository essays. The control group, however, was introduced to the same expository texts through the traditional lecture method. It was pointed out that the experimental group composed their writings in a more organised, comprehensive, and cohesive way compared to the control group, consequently, stressing the practicality of concept mapping in promoting expository writing skill.

The previous studies suggest the existence of remarkable differences between the mean scores of the pretests and posttests, signaling the fact that the experimental groups performed better than the control groups. Chiefly, although some of the previous studies operated under dissimilar methodologies and yielded varied circumstances, their findings seem to collaboratively accentuate that concept mapping can be especially helpful in reducing writing difficulties. Research has supported the use of concept mapping in all stages of writing. A concept map illustrates the connection between different ideas and the central theme. As such, it guides learners to generate, map, and organise their main and sub-ideas with particular attention to relevant supporting details.

It is important to note that although improving EFL students' writing via the utilisation of graphic organisers, in general, and concept mapping, in specific, has attracted worldwide attention, there is little literature available on this issue at Biskra University. A limited number of inquiries were particularly involved in exploring the efficacy of mind mapping on different language aspects. To exemplify, Nouri (2014) carried out an investigation, questing for the usefulness of mind mapping in lesson summarisation, whereas Ferfad (2015) endeavoured to explore teachers' attitudes toward the use of mind maps in lesson comprehension. In this connection, it is noteworthy that none of the previously conducted research studies at Biskra University was particularly interested in concept mapping.

Exceptionally, Henouda (2020) sought to uncover the extent to which this strategy works on improving the reading comprehension of 26 master students. The research findings revealed that this visual tool yielded positive outcomes with regard to the comprehension of passages. Besides, it further helped the participants to link concepts and organise ideas. Chiefly, the present study can be regarded as a continuation of Henouda's (2020) inquiry, which brought to light the effectiveness of concept mapping on one of the literacy skills—reading. The researcher, throughout the current investigation, strives to delve into the relationship between the same strategy (concept mapping) and another literacy skill (writing performance of third year students of English at Biskra University).

2.8.5 Concept Mapping as a Listening-Speaking Strategy

A great number of concept map-based research studies were carried out around the theme of meaningful learning. Nonetheless, there have been many attempts to explore further areas in which concept mapping might prove effective. Although the correlation between concept mapping and listening comprehension and speaking performance has not been extensively explored, some studies (Boroumand et al., 2021; Chen & Hwang, 2019; Sabbaghan & Ansarian, 2013) reported the efficacy of this strategy and its support to improve both skills. Chen & Hwang (2019) investigated the impacts of concept mapping-based flipped learning on EFL students' listening and speaking competencies, speaking anxiety, and critical thinking awareness.

Following the pretest-posttest control and a quasi-experimental design, 72 learners were assigned to experimental ($n = 37$) and control ($n = 35$) groups. The results manifested that the concept mapping-based flipped learning proved to be more viable than traditional flipped learning. Furthermore, in addition to the reduction of English-speaking anxiety, it has also been persuasively shown that learners' listening and speaking skills, as well as critical thinking awareness can be improved through the use of the concept mapping strategy. In their study,

Sabbaghan and Ansarian (2013) found out, after analysing the self-assessment questionnaire, that EFL learners' attitudes towards utilising concept mapping in listening comprehension were positive.

In the same context, a study described by Paxman (2011) worked on assigning the participants to three groups and asking them to listen to an interview. Prior to answering the comprehension test, the first group was instructed to listen to the tape and take notes, while the second group had to listen to the tape and underline the main expressions. The third group, however, was expected to listen to the recording, cross off the important terms, and then produce a concept map by finding the connections between the words. The investigation revealed that the third group processed information deeply, leading to better comprehension.

Not only does concept mapping help to develop learners' listening competencies, but it also enables them to express themselves effectively. Boroumand et al. (2021) indicate that this graphical diagram is a highly effective representational tool to be used in all the stages of planning and delivering a speech. Through its structure, it can function as a speech preparation method that allows for active engagement in the planning, generation, and organisation of ideas. The evidence also suggests that concept mapping is worth including in public speaking as it is a way that has the potential for displaying self-control and confidence, thereby reducing speaking anxiety. Paxman (2011) also adds that the students who generally rely on concept mapping in their presentations are typically able to maintain eye contact and use fewer notecards, thereby delivering natural and smooth speeches.

2.8.6 Concept Mapping for Academic Achievement

Concept mapping is discussed critically as an effective knowledge construction and representation tool that helps students connect the existing content and the newly gained concepts. It holds the premise of enhancing the quality and progress of student learning and, therefore, coming to be generally recognised as an appropriate alternative for note taking, summarising, outlining, and traditional lecture method. Essentially, concept mapping is a strategy that has been repeatedly demonstrated to have a positive impact on the academic performance and achievement of students, leading to better school grades (Arifin et al., 2020; Cheema & Mirza, 2013; Chiou, 2008; Kizilgol & Kilic, 2016; Patrick, 2011). A study by Arifin et al. (2020) states that the main problem experienced by the students at Syiah Kuala University was the inability to comprehend and learn biology lessons, especially those pertaining to Phylum Chordata.

It is for this reason that researchers sought to uncover the extent to which the interactive concept mapping strategy works on promoting the understanding of the introduced materials, thereby improving the learning outcomes obtained by students. Following the pretest-posttest control group design, control and experimental groups were constituted with an equivalent number of participants, 75 in each. The findings revealed that the experimental group, which was uniquely directed to learn through concept mapping, outperformed its counterpart, resulting in a noticeable increase in test scores. It was indicated, therefore, that the integration of such a strategy could potentially foster academic achievement and learning outcomes.

In his paper, Cheema and Mirza (2013) provide a framework in which the effect of concept mapping on the academic performance of 7th grade students in the subject of general science is investigated. 167 students from two single-sex schools constituted the sample of the study. A two-way ANOVA was run to test the study's hypotheses. It was noted that the students taught through concept mapping outperformed those taught traditionally. In addition,

concept mapping instruction yielded much higher results for male students than for female students.

These conclusions were also reached at by Chiou (2008) who, with a focus on exploring the practicality of concept mapping on students' learning achievement and interests, conducted an investigation at the School of Management in Taiwan. A total of 124 students were randomly assigned to two groups (the concept mapping group and the normal curriculum activities group). Data analysis revealed a significant improvement in the learning achievement of students belonging to the experimental group. In addition, and exceptionally for the experimental group, the incorporated tool was found to increase motivation and enhance interest in learning accounting.

2.8.7 Concept Mapping for Curriculum and Lesson Planning

Concept maps are employed beyond teaching and learning practices. They hold promise for being used effectively as a curriculum and lesson planning tool, therefore, being incorporated in the planning, development, instruction, or assessment stages (Erdogan, 2009). Concept mapping aids in the improvement of curriculum- and lesson-planning skills. Importantly, teachers are encouraged to apply the three different concept map morphological structures (chain, spoke, and net) to help them arrange the order of the curriculum or subject content (Kinchin, 2005). The chain-type map, as a case in point, organises elements, lessons, and materials in a linear chain-like sequence, thereby seeking continuity and logical order of ideas.

In a succinct and concise manner, the graphical and structural nature of concept mapping can help specify and present the most important ideas and concepts to be taught. With its perceived importance in clarifying and organising concepts and their linkages, concept mapping guides teachers to focus on far more than simply the content and the way it is transmitted (Kinchin, 2005; Novak & Cañas, 2015). It shifts their attention towards the numerous ways in

which students might create understanding. Kinchin (2005) adds that concept mapping should be introduced to teachers as it serves to determine and discern the learning objectives, prior and current knowledge, materials, as well as the sequence of materials. With these benefits, this tool gained ground in designing course syllabi or curricula.

2.8.8 Concept Mapping for Assessment and Evaluation

Measuring students' conceptual knowledge and deep understanding of a topic cannot usually be achieved by means of traditional assessment tools (multiple-choice tests, true/false tests, fill-in-the-blank tests, and true/false tests). Correspondingly, there is an indication that concept mapping can be a potent dynamic assessment tool for measuring concept acquisition and evaluating cross-relationships and already covered materials (Croasdell et al., 2003; Schwendimann, 2014). In their report, Novak and Canas (2015) wrote,

We are now beginning to see in many science textbooks the inclusion of concept mapping as one way to summarize understandings acquired by students after they study a unit or chapter. Change in school practices is always slow, but it is likely that the use of concept map in school instruction will increase substantially in the next decade or two.....When concept maps are used in instruction, they can also be used for evaluation. There is nothing written in stone that says multiple choice tests must be used from grade school through university, and perhaps in time even national achievement exams will utilize concept mapping as a powerful evaluation tool (p.23).

Since concept maps are a pictorial depiction of knowledge, they can best manifest concepts, links, crosslinks, hierarchical levels, and examples. Therefore, they give a great deal of information about students' clusters of ideas, the way they are organised, assimilated, and incorporated into pre-existing cognitive structures. A study by Wei and Yue (2017) sought evidence as to whether the use of concept mapping as an instructional tool can be helpful in

assessing meaningful learning in information systems education (IS education). The researchers designed a series of concept map-based assignments, which required the participants to complete concept maps. The latter were set for a thorough and completed analysis. The findings show the practicality of concept mapping in understanding and evaluating students' meaningful learning in IS education. In this regard, to determine their level of expertise in a given topic, the students can be asked to articulate their ideas by generating concept maps.

The generated concept maps need to be carefully examined and analysed so that to decide about their misconceptions, gaps in knowledge, misunderstandings, and concept mistakes. A map that encompasses multifarious hierarchies with several relevant and valid concepts and relationships exhibits a high level of student knowledge and understanding (Croasdell et al., 2003). The lack of sophistication or absence of appropriate and valid concepts, linkages, or hierarchies is evidence of the lack of understanding and limited internalised information (Croasdell et al., 2003). Simply put, concept maps are an efficient way to show what students learn and need to learn; instructors can then establish a holistic understanding of students' knowledge, thereby making sound instructional decisions and providing relevant feedback. As an educational evaluation tool, concept mapping can be used in introductory units, mid-term assessments, or end-of-course assessments. To clarify the overall thought, it can also be implemented as a self-assessment tool.

2.8.9 Concept Mapping for Brainstorming and Note-Taking

Concept mapping provides a means that can be used extensively in brainstorming and note-taking. Mapping makes it possible to think up new concepts and generate early thought, indicating the basic and complex connections among ideas. By its structure, concept mapping allows one to see the major and sub ideas and place them in the right order in accordance with the aim of the activity (Kinchin, 2005). This provides a good opportunity for constructing an

easy-to-understand network-like diagram and figuring out its contradictions, paradoxes, and gaps, all on a single page. Concept mapping was also found to be beneficial for note-taking. In this connection, it can be helpful for tracking the flow of ideas, linking them, and adding commentary. For example, Kaivola and Lokki (2010) searched for evidence as to whether the use of concept mapping could be helpful in note-taking. The findings show that many students found taking handwritten or CmapTools-generated notes to be simple, inspiring, and motivating.

2.8.10 Concept Mapping for Conducting Research

It is now widely acknowledged that concept mapping can be used for more than simply brainstorming ideas. The literature abounds with evidence revealing the usefulness of concept mapping as a methodological research strategy (Alias & Suradi, 2008; Daley, 2004). In general terms, it can be involved in various research stages as it can address methodological difficulties emerging in qualitative and quantitative forms of inquiry. On this basis, Daley (2004) expressed that concept mapping can be applied to “frame a research project, reduce qualitative data, analyse themes and interconnections in a study, and present findings” (p. 1). One of the strengths of using concept mapping is that it helps researchers to visually plan research projects, formulate initial concepts, track ideas, and clarify research methods, thereby introducing a representative form of documenting the progress of the study.

Mapping the different parts of the study together makes them more apparent, therefore, making the research plan easy to be revisited. This mapping tool is also beneficial in the data reduction stage and theme analysis. It helps transferring and displaying long texts of data into a one-page pictorial diagram. The latter helps see emerging themes and connections, which may be lost in long textual analysis (Daley, 2004). Simply put, a concept map can be created from an interview transcript as a way to capture meaning and create new understandings. The concept map can also be used to record and present the findings of a research study. It works

as a vehicle for displaying the results in a concise way, allowing readers to easily compare and contrast the findings with other research studies.

2.8.11 Concept Mapping: Theory and Practice

There are a few studies that have reported the impacts of the concept mapping approach on the relationship between theory and practice. Machado and Carvalho (2020) explain; however, that concept maps are effective not only in linking the newly constructed structures with prior knowledge but also in transferring theoretical understanding to work practice. That is, it allows students to incorporate basic theoretical knowledge into practical settings. In this manner, Machado and Carvalho (2020) also add that, especially for adult learners, the process of creating concept maps actively contributes to promoting a deeper level of knowledge understanding, enhancing decision-making skills, and solving complex problems.

2.9 Concept Mapping Assessment and Scoring Rubric

Although there is a relatively large research base on the concept mapping strategy, the literature on its validity, adequacy, and quality is limited. Allocating marks for individual maps can often be challenging and demanding for the assessor due to the lack of a unified and consistent scoring approach. Correspondingly, the question often arises as to the most appropriate way concept maps can be evaluated and graded. A number of scholars have attempted to develop numerous scoring frameworks and schemes that strive to track and assess the adequacy and correctness of some attributes related to the concept map structure, content, or both (Novak & Gowin, 1984; Santhanam et al., 1998; Taie, 2014).

These scoring approaches differ in the characteristic features of concept maps and the scores assigned to them. In essence, they can be qualitatively oriented, premised on the assessor's opinion regarding the structure of the map (form and hierarchisation), or quantitatively oriented, focusing on objective measures (counting the number of concepts, links, and hierarchical levels) (Kapuza, 2020). Miller and Cañas (2008) maintained that

concept mapping scoring schemes could broadly fall into one of the three categories, namely component-based scoring, expert map-based scoring, and scoring based on the previous two systems.

To exemplify, the traditional and well-documented scoring approach was proposed by Novak and Gowin (1984), with a focus on the map's components and structure. This system awards one point for each meaningful and valid proposition, five points for each valid level of the hierarchy, ten points for each valid and significant crosslink (only two for each crosslink that is valid but does not synthesise the relationship between related concepts), and one point for each correct example (Novak & Gowin, 1984). This is illustrated in Figure 2.8. It should be noted that scoring concept maps may possibly take around three to ten minutes depending on the complexity of the task (Besterfield-Sacre et al., 2004). In this connection, and although this scheme has been widely criticised for being time-consuming, it might help inform the evaluator about the mapper's understanding of the material.

Figure 2.8

Concept Mapping Scoring Model

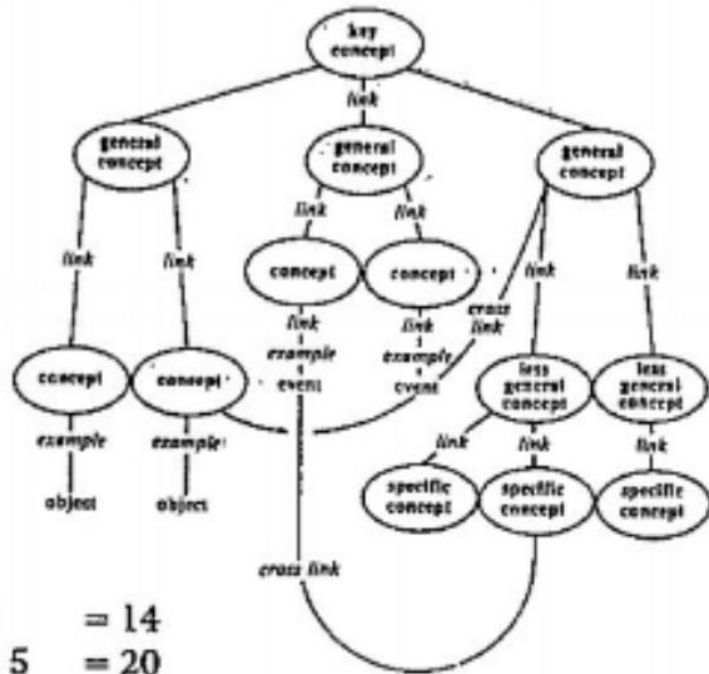
Hierarchy

Level 1

Level 2

Level 3

Level 4



Scoring for this model:

Relationships (if valid) = 14

Hierarchy (if valid) 4 x 5 = 20

Cross links (if valid and significant) 10 x 2 = 20

Examples (if valid) 4 x 1 = 4

58 points total

Note. From “Learning How to Learn”, by J.D. Novak and D. B. Gowin, 1984, p. 37.

Cambridge University Press.

As such, it gives a great deal of information about the associative relationships among concepts and the underlying knowledge structures acquired by the learner, thereby repairing any lack of understanding. Similarly, Turns et al. (2000) determined concern about concept map scoring by awarding high grades to complex and extensive concept maps. Importance is primarily placed on the number of concepts, links, crosslinks, and hierarchical levels. Another method of assessing concept maps is through the use of the Waterloo rubric. The latter, according to Deshpande and Ahmed (2019), assigns the created diagrams one of the four quality

ratings: excellent, good, poor, or fail, on the basis of six factors (concept map layout, development time, presence of descriptive connections, interconnection, and breadth of net).

Miller and Cañas (2008) sought a two-part taxonomy for concept map evaluation. The point behind this scheme is to evaluate maps structurally (topological component) and semantically (semantic component). The topological component covers five criteria (concept identification, presence of linking phrases, presence of cross-links, depth, and ramification) and seven classification levels (Miller & Cañas, 2008). Maps belonging to levels 0-2, level 3, level 4, or levels 5-6 are considered poor, acceptable, good, and very good, respectively. Miller and Cañas (2008), as well as Valerio and Leake (2008) assert that the semantic component involves assigning points for each of the following criteria: completeness and relevance of concepts, correctness and appropriateness of propositions, presence of incorrect propositions, presence of dynamic propositions, presence of cycles, and cross-link quantity and quality.

To this end, assessing and scoring concept maps is as important as their creation. Evaluating the overall quality of concept maps should be meticulously done by embracing a holistic scoring scheme adapted from the literature. In this connection, the adopted concept mapping scoring framework can bring out the best of the available rubrics. The assessment should not be directly restrained to structural information and counting parts of the map. In its simplest, the final product's adequacy and correctness should be inspected in terms of several dimensions, mainly structure, content (semantic considerations), and completeness. It is essential to seek automated evaluation as a way to replace manual analysis and provide feedback on the generated maps.

Conclusion

The current chapter provided a review of diagrammatic concept mapping, without forgetting to shed light on the definition, categories, and importance of visual displays. Substantially, and to better understand this visual organiser, the chapter elicited information on some of its major aspects that embrace types, constituting elements, process of creation, with special importance given to its emergence and scoring rubric. Following this, the chapter also depicted the fundamental role of instructional concept mapping by indicating its utility as an education and learning tool. This encompasses, for instance, its impact on teaching, learning, reading, writing, speaking, listening, achievement, conducting research, assessment and evaluation, brainstorming, and note-taking. The forthcoming chapter will stress out the theoretical background and methodological choices for the current research study.

Chapter Three: The Research Methodology for this Study

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Introduction

This chapter begins with a brief overview and summary of the widely accepted methodological elements and descriptions that form the basis for any systematic research project. These elements vary from the more general aspects that guide the researcher's course of action, such as the research paradigms, approaches, and designs, to the more specific and practical components that help answer the research questions and draw conclusions, such as data collection methods, analysis procedures, and sampling techniques. The chapter proceeded to clearly delineate and elicit the entirety of the methodological components that constitute the framework for this study, as well as provide the necessary rationale for each methodological selection and decision. The current chapter additionally surveys the stages of data collection, procedures, and methods.

3.1 Research Methodology: Theoretical Background

To better fulfill a study's aims and endeavors, a multitude of methodological descriptions and elements should be clearly delineated and explicitly defined. The comprehensive introduction and outline of these components not only serve as a foundation and a framework for the choices and the way the research study and process are performed, but also act to promote the study's validity, reliability, transparency, replicability, and ethical considerations. Such specification covers the entirety from the research paradigms to analysis procedures, involving components as varied as the research approaches, designs, data collection methods, data analysis procedures, research plan, sampling techniques, and ethical considerations.

3.1.1 Research Paradigms

The complexity of conducting and pursuing research projects arises not only from the requirement of collecting and analysing massive quantities of data and reporting the findings but also, and most significantly, from the necessity of defining and justifying methodological selections and decisions. Researchers, especially novice, are often properly guided to select the research approach and strategy, along with data collection methods and procedures, while potentially neglecting or failing to fully consider the research paradigm. Due to its role in consistently establishing the framework for approaching and conducting social research, research paradigms should not be overlooked. With this in mind, researchers should, acknowledge and give proper regard to the selective choice of adequate study paradigm that best coincides with their research nature and endeavors (Krauss, 2005). (Cohen et al., 2007; Creswell, 2014; Krauss, 2005). Fundamentally, this section delineates and goes over some definitions of the research paradigm, its defining characteristics, and types.

Before commencing any research work, the researcher must make sense of the nature of social reality and the method of obtaining knowledge. As such, a research paradigm constitutes the set of beliefs and assumptions that structure the multitude of research components and the research process. Different scholarly viewpoints hold similar views regarding the definition of a research paradigm, establishing that it denotes the set of beliefs, assumptions, and philosophical underpinnings about how things work and that characterise how scholars recognise the world and reality (Cohen et al., 2007; Creswell, 2014; Krauss, 2005). It provides a distinctive conceptual framework for guiding the researcher along the way to perceive, comprehend, and carry out research.

Pertaining to its constituting elements and components, a research paradigm consists of ontology, epistemology, and methodology. Essentially, ontology is a term that concerns being or reality (Kivunja & Kuyini, 2017). It places emphasis on existence and nature of existence, often highlighting the question of ‘what is reality?’. In the second place, epistemology, which is the study of knowledge, delves into gaining knowledge of social reality and establishing the relationship between researcher and reality (Kivunja & Kuyini, 2017). It seeks to answer the question, ‘how is it possible to know reality?’. Research methodology relates to the way of conducting research and demonstrating the validity of findings (Kivunja & Kuyini, 2017). That is, it revolves around the underlying principles to investigate social phenomena and the procedures we use to acquire knowledge about social reality in an attempt to answer the question, ‘how do we discover the reality or answer the questions?’.

Since a paradigm refers to a set of principles that underlie the way to approach research studies and academic research projects, different studies should operate under different assumptions. For example, one philosophical assumption could be that there is an external, completely objective reality that exists independently from the observer. While another assumption could be that reality is subjectively constructed by the observer. These assumptions will affect the way to approach the study; therefore, the researcher should hold certain assumption in order to continue doing research and determine methodological selections (Hoadjli, 2019). Such divergence in stands gave rise to the three major commonly agreed-upon paradigm types, including positivism, interpretivism, and pragmatism.

The positivistic paradigm builds on investigating causal relationships and testing research hypotheses. This makes it better linked to hard sciences, including domains such as physics, astronomy, and mathematics. Since positivism is best related to investigating the impact of one or more variables on others (Creswell, 2014; Kivunja & Kuyini, 2017), it generally adopts experimental and quasi-experimental research designs, manifesting the

methodologies that make use of quantitative data. The researchers with the positivist research philosophy assume that knowledge and answers can be obtained by means of objective observations, controlled experimentation, statistical measurements, and numerical data analysis. Since the positivist philosophy encourages objectivity, it aspires to achieve generalisable inferences and replicability of findings.

The interpretivistic paradigm assumes that reality is subjective and socially constructed, attempting to understand the meanings and interpretations that people assign to their experiences. It is constructed and shaped by the observer through their experiences within the social context (Creswell, 2014; Kivunja & Kuyini, 2017). Put succinctly, knowledge can be generated by exploring and understanding people's lived experiences and viewpoints; therefore, it is best studied within its social and historical context. Unlike positivism, which adopts a hypothesis-testing process, the interpretivist stance achieves its targets through an interpretive sense-construction process. Taking into account the individuals' subjective interpretations and perspectives, interpretivists adopt a more qualitative methodology, relying on such data collection methods as interviews, observations, and textual analysis.

The pragmatic paradigm, or simply pragmatism, is the perceptual orientation that is often actively pursued when the study does not fall into the clear-cut category of positivism or interpretivism. The pragmatists adopt a problem-solving mindset and an action-oriented framework to seek practical ways to achieve the research aims and answer the research questions. As its name suggests, pragmatism takes a more practical and flexible approach that endeavors to figure out how humans experience and learn about the world in a practical way, placing more attention on the usefulness and applicability of research findings. Researchers with a pragmatic research philosophy are typically involved in exploring both hard and soft phenomena, thereby employing both qualitative and quantitative methods (Creswell, 2014; Kaushik 2019; Kivunja & Kuyini, 2017). In other words, according to this viewpoint, the

combination of quantitative and qualitative techniques is imperative to comprehend the multifaceted and complex nature of human actions. Such kinds of studies often adopt a Mixed-methods approach, utilising a mix of different data types and analysis procedures.

3.1.2 Research Approaches

The plurality and diversity of paradigms in research bring into focus a set of methodologies, approaches, and tools that work together to reach the study's aims. In human and social sciences, each philosophical viewpoint is most appropriate for and well-suited to a specific research approach, typically embracing the quantitative, qualitative, and Mixed-methods approaches. It is important to mention that a research approach is subject to diverse interpretations and is therefore assigned multiple and distinct definitions. A prevalent scholarly perspective regards research approaches as the plans and procedures that cover the phases from general assumptions to the precise practices of collecting, analysing, and interpreting the collected data (Creswell & Creswell, 2018; Grover, 2015).

This methodological component simply implies the general plan or entire framework and methodology that guide the researcher's course of action during the research process and, therefore, address the research questions (Creswell & Creswell, 2018). The decision on the appropriateness of the research approach is majorly shaped and driven by the philosophical orientations and underpinnings, study's nature, and the research objectives, thereby directing the researcher to use numerical measurements, textual information, or a combination of both.

3.1.2.1 Quantitative Approach

The quantitative approach is often distinguished by the systematic data collection procedure and objective measurements with the intention of testing hypotheses and exploring relationships between variables. In pursuit of this objective, quantifiable data, numerical outputs, and graphs are highly utilised (Grover, 2015; Taherdoost, 2022). This approach also supports the use of statistical, computational, and analytical tests and methods to analyse,

summarise, and present data. Common instances of these are descriptive and inferential statistics. Quantitative research is frequently conducted in controlled conditions and contexts, where variables can be modified, manipulated, and controlled. This potentially ensures and maintains objectivity and replicability, enabling other researchers to duplicate the study and independently check the findings. It is paramount to realise that this form of investigation considers employing large and representative samples to draw conclusions about larger populations, thereby supporting the generalisability of findings.

3.1.2.2 Qualitative Approach

The qualitative approach is broadly embraced in the areas that aim to capture the complexities of human behaviour or gain a rich, detailed, and in-depth understanding of a given situation, especially in such domains as psychology, sociology, and anthropology. It is highly concerned with a detailed and in-depth exploration of the perceptions, ideas, feelings, perspectives, and experiences of an individual or group of people (Creswell, 2014; Taherdoost, 2022). This makes it more subjective in nature, involving the researcher's point of view and background knowledge in the analysis and interpretation of the gathered textual or pictorial data.

In this regard, and unlike quantitative approach, this type gives prominence to soft and non-numerical data involving words, concepts, pictures, perceptions, ideas, or descriptions. Collecting descriptive data can be achieved by engaging with tools such as interviews, observations, and focus group sessions. Qualitative approach involves the inductive approach to research, which is used to develop hypotheses, formulate theories, and generate insights that cannot be possibly targeted using quantitative methods (Creswell, 2014). Qualitative research is a naturalistic form of inquiry. Therefore, according to qualitative studies, the context determines human behaviour and experiences, highlighting the natural setting as well as the social, cultural, and historical settings within which the phenomenon occurs.

3.1.2.3 A Mixed-Methods Approach

A Mixed-methods approach strives to acquire a more comprehensive grasp of a phenomenon or a study problem by incorporating a mixture of approaches into a single inquiry. It attempts to bring the qualitative and quantitative approaches together, with one approach generally followed by and complementing the other (Creswell, 2014; Daniel, 2016; Taherdoost, 2022). By combining these two methodologies, the researcher incorporates both numerical and non-numerical data, drawing upon the strengths of each type. That is, unlike mono-method approaches, mixed-methods-based studies involve the collection and analysis of both forms of data, yielding statistical and descriptive data. Key to a Mixed-methods approach is the use of numerous qualitative and quantitative data collection methods, or simply triangulation, in order to gain a deeper understanding of the research problem, corroborate the obtained results, and cross-validate the findings.

Fundamentally, unlike the quantitative and qualitative research approaches, which are typically correlated to the positivist and interpretivist paradigms, respectively, pragmatism is the paradigm that best fits this approach. It should be emphasised that the nature of the investigation, the research problem, the researcher's own experiences, and the intended audience can all have an impact on the choice of the most relevant and applicable research approach for the study (Creswell, 2014). Importantly, qualitative and quantitative approaches should not be perceived as separate and contradictory methods. Instead, they hold different extremes of a continuum. While some studies are more qualitatively- or quantitatively-oriented, others operate under a Mixed-methods research approach, which falls in the central position on the continuum and seeks a combination of qualitative and quantitative methodologies.

3.1.3 Research Design(s) / Strategy(ies)

The research design is frequently denoted and identified as the research strategy. It is oftentimes conceptualised as the general plan and sequence of the actual steps followed by the researcher to answer the research question and achieve the aims, thereby involving arriving at selections on what, where, when, how much, and how to conduct an inquiry or study. The research design lays out the fundamentals of the inquiry, outlining the researcher's steps from developing the hypothesis to analysing data (Creswell & Creswell, 2018; kothari, 2004, Kumar, 2011). In the simplest sense, this plan outlines the framework that guides the research process, including a set of rules on how the study is going to be structured and undertaken and which components to include to collect, analyse, and evaluate data. Research designs are significant because they serve as a link between the theoretical methodological decisions made within the research project and the more practical decisions and selections.

This is the reason why research designs should align with the research philosophy selected, and they should also inform and align with sampling, data collection, and analysis methods. Not only does the research design specify and detail the research problem and methodology, but it also prescribes the processes of data collection, data analysis, measurement procedures, and reporting writing (Creswell & Creswell, 2018). To explain, it determines the type, process, and number of data collection methods and analysis procedures, as it further directs the sample and sampling decisions, influencing the size of the sample or inclusion criteria. An appropriate research design should be clearly selected and defined, maintaining suitability, feasibility, and adhering to ethical considerations (Hoadjli, 2019). This is pivotal for arriving at reliable findings and valid conclusions.

3.1.3.1 Qualitative Research Strategies

A qualitative research design constitutes the general plan and framework of the actual steps that guide the researcher to understand a social phenomenon and explore human experiences, attitudes, and behaviours. There is a massive diversity of study designs that are initially incorporated into each approach. To conduct a research study, however, there must be at least one research design that best conforms to the study's nature and objectives. It should be pointed out that the four most common research designs within qualitative research are phenomenological, grounded theory, ethnographic, and case study.

3.1.3.1.1 Phenomenological Design. In brief, phenomenological design seeks to perceive the essence of human experience and phenomena by exploring the meaning of lived experiences and understanding people's perspectives and emotions in specific situations (Creswell et al., 2007).

3.1.3.1.2 Grounded Theory. As the name implies, grounded theory strives to develop and generate theories based on the analysis and comparison of the set of collected data (Creswell et al., 2007).

3.1.3.1.3 Ethnographic Design. Ethnographic design, according to Creswell (2009) involves gaining insights into the behaviours and beliefs of a culture-sharing group of people by studying them in their natural setting.

3.1.3.1.4 Case Study Design. Case study design involves exploring the behaviours and experiences of a specific number of units, either a single individual or a single group of individuals, in their life context (Creswell et al., 2007).

3.1.3.2 Quantitative Research Designs. A quantitative research design refers to a specific design type that confines its scope to the procedure that governs and specifies the details of quantitative research. They typically entail manifesting numerical data collection and analysis in order to examine relationships and test hypotheses. Although causal-

comparative research, single-subject design, and pre-experimentation are among the quantitative research designs, it is noteworthy that correlational research design, descriptive research, true experimentation, and quasi-experimentation emerge as the most increasingly recognised and frequently utilised designs that quantitative research may operate under.

3.1.3.2.1 Descriptive Research Design. As its name suggests, descriptive research design focuses on describing existing conditions and characteristics through systematic data collection without manipulating any variables. Notably, this design type does not examine relationships between different variables or the causes that underpin such relationships (Thomas & Zubkov, 2023).

3.1.3.2.2 Correlational Research Design. Correlational design looks at identifying and measuring relationships between two or more variables without manipulating them (Thomas & Zubkov, 2023). It is more commonly used in situations where the researcher wishes to know if a change in one thing is followed by a change in another. Since this design cannot establish causality, it is more applicable in cases of exploring potential correlations between variables that cannot be manipulated or controlled.

3.1.3.2.3 Experimental Research Design. Experimental research design strives to examine the existence of a causal relationship between variables. For the purpose of drawing conclusions about potential causality, and to determine the effect on the dependent variable, only the independent variable is manipulated (Rogers & Revesz, 2019). The experimental design is not without its limitations, thereby limiting the generalisability of the results. This oftentimes makes the development of a rigorous experimental design a challenging endeavor.

3.1.3.2.4 Quasi-experimentation. Quasi-experimentation, which is valuable in several contexts, is often sought to address and mitigate the shortcomings of true experimentation. Notably, it strives to investigate causal relationships linked to a given treatment, and when the random assignment of participants is not practically or ethically possible (Rogers & Revesz,

2019). The researcher, instead, relies on existing groups or pre-existing conditions to form groups. It is vital to bring attention to the fact that an array of designs is covered and embedded in the quasi-experimental design, establishing such types as the one-group time series, the one-group posttests only, the one-group pretest-posttest, the pretest-posttest non-equivalent group, the posttests only non-equivalent groups (Cohen et al., 2007).

3.1.3.3 Mixed-Methods Research Designs

Mixed-Methods research design, also known as triangulation, refers to the arrangements and sequence of steps in relation to the gathering, analysis, and incorporation of both forms of data. One of the forms is numerical, based on ratings, while the other is non-numeric, based on textual or descriptive information. The combined application of both methodologies offers adequate evidence for the analysis, integration, and comparison of the results, allowing researchers to have a deeper knowledge of the study problem and question than each method alone. It is paramount to highlight that there are six established types of mixed-methods research designs, namely convergent parallel, explanatory sequential, exploratory sequential, embedded, transformative, and multiphase.

3.1.3.3.1 Convergent Parallel Design. A convergent design is a single-phase design that aims to gain a complete understanding of the research problem by capturing quantitative and qualitative perspectives. Chiefly, the two databases are collected, analysed, and merged before they are set for analysis, comparison, and interpretation (Creswell, 2014). To elaborate further, quantitative and qualitative data collection phases occur simultaneously and concurrently; nevertheless, the analysis procedure for each data type occurs independently. The results from both analyses are combined and brought together to facilitate triangulation, comparison, and interpretation. In this way, the areas of convergence or divergence can be easily established.

3.1.3.3.2 Explanatory Sequential. Explanatory sequential design is a two-phase design where one phase is directly followed up with the second phase. This entails sequentially connecting quantitative and qualitative data collection and analysis, with the latter following up on the former (Creswell, 2014). Qualitative research and databases are implemented to help thoroughly explain and interpret the initial quantitative results. The two sets of data are later integrated and synthesised to draw conclusions.

3.1.3.3.3 Exploratory Sequential. In the scope of a Mixed-methods approach, exploratory sequential design is often adopted when the research problem is more qualitatively oriented, starting with the qualitative data collection and analysis, as the first phase, and moving on to the quantitative data collection and analysis, as the subsequent phase. In this case, the quantitative data help to potentially confirm qualitative findings, generalise the qualitative results, or identify new variables (Schoonenboom & Johnson, 2017).

3.1.3.3.4 Embedded Design. Embedded design, also known as nested design, is characterised by the simultaneous or sequential collection of quantitative and qualitative data, with only one method playing the primary role (Creswell, 2012). The purpose of collecting secondary data is to supplement or reinforce the primary data. Since, in the research study, one of the methods dominates and takes priority over the other, it plays a fundamental role in guiding the project, thereby answering the main research question(s). Conversely, the second method is embedded, or nested in the primary one; therefore, it plays a supporting function in the procedure.

Chiefly, the embedded approach may answer a secondary research question or address a specific issue related to the general research question. It is vital to highlight that the second data set may be collected and analysed before, during, or after the collection and analysis of the first data set (Cresswell, 2012). It is widely acknowledged that most scholars advocate the incorporation of qualitative data into quantitative methods, such as using an interview to gather qualitative data to help understand how participants perceive the intervention, the impact of which is quantitatively tested (Creswell, 2012).

The embedded design can be quantitatively or qualitatively dominant. A quantitatively dominant embedded design is sought when the researcher collects mostly quantitative data and a lesser amount of qualitative data. For example, a subset of participants can be interviewed after carrying out of a survey. When the researcher, however, collects mostly qualitative data and a lesser amount of quantitative data, the choice would rather go to the qualitatively dominant embedded design. An example of this is when the conduct of an in-depth interview is followed up with a quantitative questionnaire.

3.1.4 Data Collection Methods

While each methodological selection and stage of the research process is critical, it is particularly imperative for researchers to recognise that data collection holds paramount importance in education research, for it offers methods of directly measuring variables. To gather first-hand information about the targeted variables of the research study, at least one data collection method should be selected out of a wide range of alternative options. A multiple use of tools in a single study is not unusual. This can provide more insights and data needed for answering the research question(s). Put simply, data collection points to the systematic way of employing firmly established and carefully selected methods and tools for the purpose of collecting and gathering data on targeted variables (Kothari, 2004). Appropriate and proper

data collection, irrespective of the instrument employed, necessitates not only clearly established objectives and careful designing but also adhering to ethical considerations.

3.1.4.1 Quantitative Data Collection Methods

Since quantitative data collection is of a numerical nature and involves the systematic procedure of collecting quantifiable and statistical data, it is often pursued by means of multiple choice, Likert scale, rating scale, true/false questions, semantic differential scale, close-ended questions, and rank-order items. Some of the most commonly established ways to gain quantitative data in educational research are tests, quantitative interviews, and close-ended questionnaires. Questionnaires and tests are among the most popular and frequently embraced methods in the social sciences.

A questionnaire, a stand-alone data collection method, involves a set of standardised questions or specific prompts for gathering the same information from a group of individuals. It yields a set of questions provided in written form that require writing answers or making selections (Pandey & Pandey, 2015; Taherdoost, 2021). It is acknowledged that questionnaires are of three basic types, with the semi-structured questionnaires, often used in mixed-methods research, utilising a combination of both closed-ended and open-ended questions. Essentially, while the unstructured questionnaire makes use of open-ended questions within the scope of qualitative research, the structured questionnaire employs closed-ended questions within the realm of quantitative research.

Dörnyei (2003) expounds on the existence of three data categories manifested through the questionnaire items. Those types may well involve factual questions, looking into the respondents' factual information (gender, race, age, place of residence, level of education, marital status, and religion), behavioural questions, seeking the respondents' behaviours and habits, and attitudinal questions, querying about opinions and attitudes. Depending on the questionnaire's aim(s) and the accessibility of respondents, it can be mailed,

administered hand-to-hand in a paper-based form, or administered in an interview-type situation. To ensure accurate and reliable data collection, the questionnaire needs to be carefully constructed and refined with regard to such potential aspects as its overall structure (form), question formulation (wording), and the sequence of questions.

Tests, which also incorporate quizzes and assessments, are another common quantitative data collection method that provides statistical data. They are generally regarded as valid instruments, typically used to measure one or more variables and assess knowledge, performance, or skills (Cohen et al., 2007; Miller, 1984). It is important to clarify that the researcher may opt to develop a new test to achieve the research targets and answer the study's question, as s/he might choose to adapt an already existing pre-designed test.

Notably, such tests can be administered on paper, electronically, and in an online or electronic format. Chiefly, some programs can create specific kinds of assessments that target a given group of participants. There are a variety of statistical tests, each suited to a specific data type, in order to fulfil a predefined purpose. Examples of tests are the two broad categories of parametric tests, involving instances as paired t-test and Pearson correlation, and non-parametric tests, incorporating cases as Mann Whitney test and spearman correlation. According to Miller (1984), the two most important elements determining the test's relevance and applicability are the research design and the type of dependent variable.

3.1.4.2 Qualitative Data Collection Methods

Since qualitative data collection aims to capture the complexities of social phenomena and human behaviour by gathering and gaining a rich and in-depth exploration of people's perceptions, attitudes, feelings, and experiences, it is more likely to use open-ended questions. In accordance with this, a variety of commonly employed methods for qualitative data collection comprise interviews, observation, open questionnaires, documentation, think-aloud method, journals, collection of narratives, and focus groups.

The interview is one of the most extensively adopted qualitative data collection methods. The interview involves engaging in a conversation and interaction between the researcher and the interviewees, with questions asked verbally and often face-to-face (Monday, 2019, Dörnyei, 2007). This method strives to collect in-depth insights and as much information about the topic as possible, thereby understanding the topic from the interviewee's' point of view (Pandey & Pandey, 2015). Interviews can be structured (with predefined content, close-ended questions, and procedure), unstructured (free conversation with no predetermined questions), or semi-structured (flexible format with pre-prepared and guided open-ended questions).

Although the interview oftentimes takes place as a face-to-face conversation, it can also be conducted via telephones or the internet. Therefore, they can be short and focused, as well as intense, involving multiple sessions. It is the researcher's role to create a non-threatening, stimulating, and supportive environment where the interviewees feel free to respond verbally and express their beliefs or opinions.

3.1.4.3 Mixed-Methods Data Collection Methods

Since the Mixed-methods approach brings qualitative and quantitative methodologies together, mixed-methods data collection gathers varied numerical and non-numerical data using methods from both perspectives. That is to say, and given the study's purpose, the researcher needs to use an assortment of qualitative and quantitative data collection methods, or simply triangulation.

3.1.5 Data Analysis Procedures

Establishing a solid plan for raw data collection cannot by no means answer the research question(s); researchers, therefore, should play another crucial role in determining and planning data analysis procedures. Another equally important research step with the aim of adding meaning to data and answering the research question(s) is data analysis. The latter describes the

systematic procedure of examining, cleaning, organising, processing, describing, and interpreting the data collected through precisely delineated methods and tools (Kothari, 2004; Pandey & Pandey, 2015). Such methods help identify relevant information, make statistical inferences, uncover emerging trends, or pinpoint specific patterns.

The variety in data type and data collection methods in research gave rise to numerous data analysis methods, examples of which can be manifested in statistical analysis, qualitative analysis, time series analysis, machine learning, text analysis, data mining, data visualisation, spatial analysis, and network analysis. Unlike quantitative studies, which decide on the calculations and statistical tests to use for analysis, qualitative-based inquiries consider the type of approach needed for categorising and interpreting data (Mohaiminul, 2020; Pandey & Pandey, 2015).

In conformity with the framework of the quantitative approach and to analyse the collected number-based form of data, statistical analysis is frequently implemented. Statistical analysis signifies the use of statistical and mathematical tools, techniques, formulas, and measures that are meant for analysing and interpreting data, such as measures of the central tendency, hypothesis testing, ANOVA, correlation analysis, and regression analysis (Lang et al., 2016). Generally speaking, statistics can help summarise sample data, test hypotheses, make estimates about the population, and make inferences. Descriptive statistics, as one type of statistics, refers to a number of measures applied for purposes as varied as organising, summarising, and describing a dataset (Kothari, 2004; Miller, 1984). Descriptive statistics are primarily manifested in measures of frequency (frequency, percent, and counts), measures of central tendency (mean, median, mode), and measures of dispersion or variation (standard deviation, range, and variance).

Inferential statistics relies on using the sample data to make inferences about the population, thereby making it a critical stage in the research process, for it guides group comparison, hypothesis testing, inference making, and conclusion drawing (Adeyemi, 2009; Dörnyei, 2007; Kothari, 2004). This is often accomplished through the implementation of a variety of statistical tests, with each chosen on the basis of several factors involving the research question and objective, the distribution of data, the types of variables, and the number of groups in the study. There exist two potentially broad categories of statistical tests (Adeyemi, 2009). The first represents the parametric tests that significantly yield regression tests (such as simple linear regression, multiple linear regression, and logistic regression), comparison tests (such as t-tests, ANOVA, and MAOVA), and correlation tests (such as Pearson correlation coefficient, spearman's rank correlation coefficient). Non-parametric tests may entail a couple of instances, such as chi-square test of independence and Wilcoxon rank-sum test.

Qualitative analysis is another popular way of analysing non-numerical data collected through interviews, observations, or open-ended survey questions (Cohen et al., 2007). It is about providing and assigning meanings to data by extracting what is relevantly needed for answering the research questions and later comparing the obtained findings to existing literature. After collecting the necessary data, it should undergo cleaning, analysis, interpretation, and analysis. To explain, the general procedure for qualitative data analysis undergoes the stages of (1) data organisation and preparation, (2) data familiarisation, (3) coding, (4) theme generation, (5) data description and reporting.

Thematic analysis is one of the most widely employed qualitative analysis methods that may embody a broad selection of method choices such as content analysis, grounded theory, narrative analysis, interpretive phenomenological analysis, and discourse analysis. Thematic analysis involves labeling recurring concepts and topics, or simply assigning themes, to large bodies of data (Clarke & Braun, 2013). That is, this analysis type, which is useful for specifying

people's' views and experiences, focuses on identifying patterns of meaning in a dataset by grouping it according to similarities (themes). This analysis method proceeds with the systematic process of familiarising oneself with the data, generating codes, generating themes, reviewing themes, defining themes, and writing the findings.

It is important to note that, within thematic analysis, a code is a label that describes a piece of content. At its simplest level, coding means creating and assigning segments of data (piece of text or part of an image) to a category called code, which will help in deriving themes (Clarke & Braun, 2013). Coding can be accomplished manually or with the assistance of computer software programs, examples of which are NVivo, MAXQDA, or ATLAS.ti, Dedoose, and QDA Miner. MAXQDA (max qualitative data analysis), originally developed by Verbi Software, is a simple, easy-to-use qualitative data analysis software that allows the user to work on the data easily and smoothly, with special attention given to importing the data, coding different data formats, analysing the data, and visualising the steps and findings (Silver & Lewins, 2014).

This software guides the user to analyse and visualise images, audios, videos, and, above all, texts, as it offers possibilities for individual work, communication, or collaboration. Different data formats should initially be brought and imported into the software system before they are set up for coding. Through its available coding features, MAXQDA enables the researcher to methodically read, breakdown, and arrange their data, regardless of its type, into a hierarchically organised code system. In addition to data visualisation and analysis, another advantage of MAXQDA is its capacity for providing an array of functions such as code frequencies, creating charts or graphs, and code relations.

3.1.6 Sampling Techniques

It is not always possible or feasible to obtain and collect data from a larger group or the entire population. In many cases, given time, cost, and logistics constraints, working with a small subset of items or individuals can be more practical and manageable, in a process known as sampling. Sampling is the process of selecting or choosing a limited number of participants, items, or units of interest a larger group (Mulisa, 2022; Pandey & Pandey, 2015). An important issue with regard to sampling is the question of representativeness.

As stated by Dörnyei (2007), a good sample needs to accurately reflect and portray the general attributes of the entire population, including such parameters and aspects as gender, age, educational background, ethnicity, and social class. A sample that is perfectly representative of the population allows the researcher to generalise the findings to the whole population. In many studies, however, achieving a truly representative sample is challenging as there are numerous practical obstacles that arise in real-world settings (Pandey & Pandey, 2015). Importantly, at the highest level, there are two typical sampling approaches, namely probability sampling and non-probability sampling, with each yielding a couple of sampling methods.

3.1.6.1 Probability Sampling

Probability sampling techniques involve selecting a small portion of participants or items from the population without pre-planning on a statistically random basis. This perspective is a process-driven approach based on a predetermined process. Having its foundation in probability theory, probability sampling fully depends on chance and not the discretion of the researcher. This may likely lessen the researcher's bias (Dörnyei, 2007; Cohen et al., 2007). In this respect, every member of the population has an equal chance of being included in the study since random selection is used to construct the sample.

This type of sampling is most commonly used in quantitative and statistics-based research studies where achieving generalisable findings is the ultimate objective, thereby drawing conclusions about the larger population of interest. It is important to note that probability sampling is infrequently and rarely implemented in applied linguistics for it is usually unaffordable for researchers, yielding demanding and costly procedures (Dörnyei, 2007). In the collection of probability-based sampling methods, stratified samples, simple random samples, stage samples, cluster samples, systematic samples, and multi-phase samples are the most common ones.

3.1.6.2 Non-Probability Sampling

Non-probability sampling is also known as deliberate sampling. Non-probability sampling is a collection of methods that, as opposed to random selection, enables the researcher to deliberately pick units from the population at large based only on his or her subjective judgement. Participant selection is not made on a statistically random basis based on a predetermined process (Mulisa, 2022). Instead, it is directed by the researcher's judgement, thereby diminishing the equal chances of selection.

This always brings about the problem of bias; therefore, the sample cannot be representative of the population, nor can the findings be generalised to a broader scope (Makwana et al., 2023). Such type of sampling is often more commonly adopted in researches where the richness of the data is more important than the generalisability of findings. Given its affordability and less complicated nature, non-probability sampling finds more application in applied linguistics. A selection of non-probability sampling techniques includes purposive sampling, convenience sampling, snowball sampling, quota sampling, and dimensional sampling.

3.2 Research Methodology for This Study: Choices and Rationale

3.2.1 Research Paradigm

As previously elucidated, the research paradigm is a set of beliefs and assumptions that establish foundational guidance into the way the researcher frames research, approaches the study, and develops the methodology with reference to the selection of the research design, approach, and methods. Clearly, it influences the researcher's ontological, epistemological, and methodological decisions. In basic terms, while positivism is rooted in the view that reality is independent of the observer and knowledge can be obtained through objective observations, interpretivism takes the opposite position, manifesting that reality is subjectively constructed by the observer through their experience of it.

Chiefly, in the context of the present investigation, the choice of the research paradigm is based on the researcher's world view combined with the nature of the research aims and questions. At its core, within the scope of this study, the researcher strives to explore the practicality of the concept mapping pre-writing strategy as a means to promote students' writing performance, as well as to identify their attitudes towards its utilisation in planning the writing activity. Therefore, given the focus of this study, neither positivism nor interpretivism is practical and conducive to accomplishing the research aims and answering the research questions.

In essence, the pragmatic philosophy is adopted, which focuses on the usefulness and applicability of research findings. This type of viewpoint is valuable as an essential way not only to understand the impact of concept mapping on writing performance test scores but also to check whether the participants enjoy the process of generating it. It simply allows the researcher to develop a much more holistic and comprehensive understanding of the efficacy of the studied strategy and its practical implications by drawing on a synthesis of both types of

data. Essentially speaking, the combination of quantitative and qualitative techniques is imperative to comprehend the multifaceted and complex nature of the participants' actions.

3.2.2 Research Approaches

Given the nature of the current investigation, the study does not embrace a mono-method approach. Since the inquiry works under a pragmatic orientation, it typically adopts a Mixed-methods approach, which combines quantitative and qualitative methodologies. Pertaining to the framework of the study, the quantitative data and analysis provide statistical evidence on the practicality and impact of concept mapping on students' writing performance, while qualitative data primarily offer in-depth understanding of the attitudes of students with regard to the use of concept mapping in planning the writing activity. The use of the quantitative approach is followed by the qualitative one in a way that corroborates the obtained findings and explores the underlying students' attitudes. Practically, and to address the research problem and answer the research questions, the researcher takes advantage of quantifiable data, statistics, computational and analytical tests, graphs, non-numerical data, words, and perceptions.

3.2.3 Research Design(s) / Strategy(ies)

The current research project primarily aims to examine the practicality and impact of concept mapping on students' writing performance and to identify their possible attitudes towards the implementation of the strategy in the pre-writing stage of the writing process. To reach this target, and in a single study, the researcher ultimately collects quantitative data, which are evaluated statistically to uncover patterns, relationships, and trends, as well as qualitative data, which are analysed thematically to identify themes and meanings. Given that the primary focus of this investigation is examining the impact of concept mapping on writing performance (a quantitative aspect), the qualitative method (interviews about attitudes towards the strategy) should be embedded within the quantitative method.

Following this, an embedded mixed-methods research design that is quantitatively dominant would be well-suited and more appropriate in the present study. In this case, the qualitative data can help explain or interpret the quantitative findings, providing a more complete picture of the effect of concept mapping on writing performance and the way the participants experience the intervention. It is essential to note that the embedded design enables the researcher to explore students' opinions toward the concept mapping approach within the context of the central quantitative phase. Quantitative and qualitative data are collected sequentially, with the quantitative data collection and analysis preceding the qualitative data collection and analysis.

3.2.4 Data Collection Methods

The study under investigation aspires to examine the practicality of concept mapping on students' writing performance and to identify their attitudes in respect of its implementation in the pre-writing stage of the writing process. Another target is the endeavor to explore the basic obstacles faced by students while immersed in the writing task, along with the factors underlying those struggles. As far as the study's aims, design, and approach are concerned, data collection comprises utilising an extensive range of methodologies, following a multi-method procedure. This is made possible through triangulation, allowing us to cross-verify, compare, and contrast the results obtained from diverse data collection methods.

The data gathering process in this investigation is carried out through the use of an assortment of instruments, namely a student pre-treatment questionnaire, a teacher questionnaire, pretest and posttest, and a student post-treatment interview. Such instruments are determined to be appropriate for directly measuring variables, with each data gathering method capturing distinct facets of the research problem, thereby gaining a thorough and deep grasp of the research phenomenon. In essence, seeking a variety of tools to collect data holds importance not only in gaining in-depth understanding of the participants' unique experiences and

viewpoints regarding the application of concept mapping but also in increasing the study's validity and mitigating the biases and constraints brought about by employing a single technique.

3.2.4.1 The Student Pre-treatment Questionnaire

The pre-treatment questionnaire (See Appendix 5) was one of the data collection methods selected for capturing baseline data about the study participants, on the one hand, and for gaining the necessary information required to address the study's first research question, on the other hand. The administration of the pre-treatment questionnaire to the participants was prior to the main study, preceding the intervention and study sessions. Clearly, participation in the planned treatment was conditional upon the completion of the questionnaire. That is, the students were not allowed to attend the treatment sessions, nor were they permitted to perform any of the designed tasks, until they responded to the questionnaire and filled it out beforehand.

3.2.4.1.1 Aim and Structure. The aim of the questionnaire is typically geared towards providing insights into the first research question, enquiring about the major difficulties encountered by third year students of English at Biskra university while engaged in the writing task. This target establishes the primary objective of the pre-treatment questionnaire, which also holds another supplementary and secondary role of gauging students' familiarity and understanding of the targeted strategy. In addition to answering the raised question, the obtained data, at this level, can potentially play a crucial role in building a comprehensive understanding that can inform the most relevant ways of content planning and delivery. This is particularly true for a number of elements, including the specificities, characteristics, and implications of concept mapping. Furthermore, this can significantly influence the selection of topics, materials, instructional strategies, and presentation style.

The pre-treatment questionnaire, which was meant to be administered hand-to-hand, comprises a set of questions and prompts provided in written form. Chiefly, it is semi-structured in nature, incorporating a combination of both closed-ended and open-ended questions. With regard to the organisation and sequence of the included items, the questionnaire yields three types of data categories, predominantly classified and structured in three main sections. These categories are manifested in (1) factual questions, representing the first section, to check basic factual information provided by respondents (gender, most challenging language skill); (2) behavioural questions, representing the second section, to inspect the respondents' habits and practices in relation to writing, writing strategies, and difficulties; (3) attitudinal questions, representing the third section, querying about students' familiarity, use, and attitudes regarding their participation in the study sessions. The questionnaire's structure and the objectives of each section are displayed in table 3.1.

Table 3.1*Student Questionnaire Sections and Objectives*

Sections	Item	Content	Objectives
Section one	1-2	General Information	To better understand the respondents in terms of gender and the most challenging language skill.
Section two	3-10	Writing Performance	To delineate the participants' practices, especially in relation to: frequency of writing, most challenging writing stage, Existence and specification of writing struggles, use of pre-writing strategies.
Section three	11-14	Concept Mapping	To inquire about students' familiarity, use, and attitudes towards the participation in the concept mapping study sessions.

3.2.4.1.2 Validation. Majorly, validation, as another important aspect, signifies the extent to which an instrument measures what it is supposed to measure (Cohen 2007; Zohrabi, 2013). Simply put, it is to check whether the data collection method truly captures what it is intended to examine. Multiple methods and approaches for evaluating the validity of a data collection tool are at the disposal of the researcher. In this connection, the pre-treatment questionnaire's validation has so far been checked by means of subjective evaluation. A panel of four expert teachers was invited to review and scrutinise the questionnaire items in order to assess whether they adequately measured what they planned to measure.

The teachers were supplied with a validation form or checklist (See Appendix 4) that lists certain parameters and requirements for determining the validity of the questionnaire. This could involve instances like clarity, simplicity, and relevance. To arrive at the finished piloted and validated version of the questionnaire, all feedback and comments originally established from students or experts were given due consideration, including those pertaining to redundancy, type of questions, flow, timing, meaning, format, questionnaire appearance, sectionalising, numbering, itemisation, instructions. Accordingly, some minor revisions were sought. To systematically refine the questionnaire, some question items were consequently reformulated, while others were totally omitted.

3.2.4.1.3 Piloting. Before the implementation of data collection methods in a real, full-scale study, they need to be tested and checked for any anomalies, irrelevancies, and inconsistencies, thereby promoting their functionality and practicability. This typically involves testing them under the same circumstances and in the same manner. To ensure that data collection methods are successfully piloted, valid, and reliable, an established basis for verifying piloting, validation, and reliability is required. In research, piloting involves testing and trying out the data gathering instrument on some units before the tool is essentially administered or employed in the actual study. This helps to gain feedback and make necessary adjustments. Within the framework of data collection, the student pre-treatment questionnaire was first piloted by being administered to a small number of students who belonged solely to the target population. More specifically, and beyond the study's sample set, 10 third year students of English at Biskra University were requested to review and respond to the questionnaire, delineating any areas of ambiguity, confusion, repetition, irrelevancy, etc.

3.2.4.1.4 Reliability. Reliability, however, involves the extent to which the results can be replicated under the same or similar conditions. Simply put, it is to check whether data collection methods and analysis procedures would reproduce consistent results on different occasions in case of repetition or replication (Cohen 2007; Zohrabi, 2013). A reliable tool has the potential to bring out similar results over time. To assess the reliability of data collection methods, a number of methods can be frequently employed. One way is through the evaluation of internal consistency reliability, which denotes how well various items in a measurement tool measure the exact thing, theme, or construct over time.

Stated differently, it evaluates the extent of consensus or correlation between several items. One of the various ways available to evaluate internal consistency reliability is through Cronbach's alpha coefficient. Strong internal consistency is established by a high Cronbach's alpha score (as close to 1 as possible). To test the reliability of student questionnaire, we relied on measuring Cronbach's alpha coefficient as an indicator of internal consistency reliability. The questionnaire's estimated Cronbach's alpha coefficient was about 0.86, reflecting a good internal consistency level among the items. Therefore, the questionnaire is deemed reliable, measuring the same construct.

3.2.4.2 Teacher Questionnaire

Another data collection method that is prominently used to achieve one of the study targets is the questionnaire, which addresses a selected group of teachers of written expression. The questionnaire was predominantly administered to the target sample before the main study took place, and the researcher was fully engaged with the intervention sessions. Following the previous section, the current one provides detailed explanations regarding the particulars of this method, elaborating on its structure, aim, piloting, validation, and reliability.

3.2.4.2.1 Aim and Structure. The second research question is designed to be addressed and answered by means of teacher questionnaire (See Appendix 6). The major aim of this method is to identify the underlying, most prevalent causes of writing difficulties among third year students of English at Biskra University. Since the teacher plays a crucial and supportive role in affecting and shaping students' writing skills, the questionnaire also endeavors to uncover some of the teachers' practices in the written expression course. This includes items pointing out the way teachers consider teaching writing, students' writing difficulties, the support provided to low achievers, teachers' introduction of pre-writing strategies, teachers' encouragement for the use of graphic organisers, and teachers' encouragement for the use of concept mapping.

Participants' preferences for the questionnaire administration methods differ, with some favoring paper-based questionnaires while others supporting online-based administration. To reach an agreement, the researcher administered a traditional paper-based questionnaire in person (hand-to-hand), along with digital versions originally shared via email. The questionnaire makes use of a mixture of open-ended and closed-ended questions, reflecting a semi-structured nature. To meet the criteria of a well-constructed questionnaire, and similar to the student pre-treatment questionnaire, the teacher questionnaire comprises three fundamental data categories, primarily categorised and organised into three sections. While the first section embodies four factual questions, providing basic factual information about the sample teachers, the second and third sections constitute seven behavioural questions and three attitudinal questions, respectively. Table clarifies the questionnaire's structure and the objectives of each section.

Table 3.2*Teacher Questionnaire Sections and Objectives*

Sections	Item	Content	Objectives
Section one	1-4	General Information	To uncover aspects such as gender, degree, teaching English period, and teaching writing period.
Section two	5-11	Teachers' Practice in the written expression course	To specify the teachers' practices, especially in relation to: the way teachers consider teaching writing, writing difficulties identification, reasons leading to writing difficulties, support to underachievers, prewriting strategies introduction and use
Section three	12-14	Concept Mapping	Teachers' encouragement for graphic organisers' use, teachers' encouragement for concept mapping use, and teachers' attitudes vis-à-vis the concept mapping implementation to improve learners' writing performance.

3.2.4.2.2 Validation. For validation purposes, and to check whether the teacher questionnaire effectively measures what it is supposed to measure, or simply the intended construct, expert evaluation is sought. Experts are those researchers, teachers, and practitioners with knowledge and experience pertinent to the topic or theme that is examined by the questionnaire. Therefore, in order to determine whether the questionnaire sufficiently assesses the intended concepts, a team of four expert educators was asked to review and evaluate the questionnaire items. A validation form (See Appendix 4) outlining particular requirements and criteria for assessing the questionnaire's validity was presented with the questionnaire to the teachers. Examples of such criteria could be items like simplicity,

relevancy, and clarity. All remarks and suggestions received so far in relation to redundancy, question types, and instructions were taken into account.

3.2.4.2.3 Piloting. Before its practical administration to the study sample, the teacher questionnaire first underwent a strict assessment procedure concerning its piloting, validation, and reliability. A limited number of teachers, who were exclusively members of the target population, were provided with the questionnaire as part of the initial piloting phase. Particularly, four expert teachers, two of whom are in charge of the written expression course, at Biskra University were asked and called upon to reply to the questionnaire and to critically reflect on and evaluate it in terms of clarity, redundancy, ambiguity, itemisation, repetition, instructions, timing, format, sectionalising, and many other criteria.

3.2.4.2.4 Reliability. To achieve the reliability condition for teacher questionnaire, an evaluation of internal consistency reliability needs to be pursued and confirmed by means of Cronbach's alpha coefficient. The latter serves to ascertain whether the set of items belonging to the questionnaire consistently measures the same attribute. The calculated Cronbach's alpha coefficient for the questionnaire was roughly 0.80, indicating a good degree of internal consistency between the items. Since this obtained measure typically signifies that the questionnaire measures the same construct and every item in the questionnaire correlates fairly well with other questions, the questionnaire is therefore considered reliable.

3.2.4.3 Tests

The present investigation is guided by four research questions, with one principally revolving around examining the extent to which the use of concept mapping as a pre-writing strategy impacts the writing performance of third year students of English at Biskra University, specifically in terms of content, organisation, and mechanics. In order to adequately and fully attain this objective, a methodical procedure, which involves administering two distinct tests, is adopted. The two assessments, which are depicted in a pretest and a posttest, were

administered at two different time points, with the former being administered before the treatment and the latter following the treatment. To ensure practicality and effectiveness, both the pre- and post-treatment tests are set for piloting, validation, and reliability.

3.2.4.3.1 Aim and Structure. Pretest and posttest are invaluable quantitative data collection methods employed as means of collecting numerical and statistical data, therefore providing empirical evidence on the practicality of concept mapping. Both tests seek to establish the participants' skills, knowledge, and performance in writing in terms of content, organisation, and mechanics before and after the treatment takes place. In a more focused manner, the purpose of the pretest is to assess the participants' pre-existing ability levels and initial performance in writing with respect to content, organisation, and mechanics prior to the execution of the study's treatment. In like manner, the posttest works as a follow-up assessment tool, for it typically measures the same performance and skill level that resulted after the implementation of the study treatment. When the posttest and pretest results are compared, the researcher can identify trends and patterns, specify existing differences, test hypotheses, and draw conclusions, thereby making informed decisions on the efficacy of the treatment.

Although both tests are administered at different times, it is essential to highlight that they have comparable characteristics, maintaining the same purpose, content, format, length, appearance, and scoring. The allotted time limit for the test is one hour, during which the participants are asked to respond to the question. This specified time frame, according to expert teachers, was adequate to ensure that the students have sufficient and equal time to address the task. Given that both tests assess writing proficiency and performance, their aim is to extensively engage students with the writing task and encourage them to write as much as possible. Therefore, with regard to their structure and content, the tests are one-question activities, with each requiring students to compose a paragraph of about 10 to 12 lines, elucidating the effects of online learning on student achievement (for the pretest) and

elucidating the effects of the popularity of fast-food restaurants on health (for the posttest). Under examination conditions and for research purposes, the test answer sheet is structured in a way to comprise essential and relevant information with regard to student's name, group number, date, duration, clear test instructions, and adequate blank space for answers.

3.2.4.3.2 Validation. Since validity signifies the extent to which an instrument measures what it is supposed to measure, validating the pretest and posttest is rudimentary for checking whether such data collection methods truly capture what they are intended to examine (writing performance). The general methodology embraced in this study for validating the pretest and posttest measures is through expert judgment and opinions. In the interest of evaluation, both tests were handed to three educators with subject expertise who are in charge of the written expression course. They were tasked to inspect the tests for any irrelevancies and for concerns of clarity, wording, understandability, and representativeness. None of the teachers reported weaknesses, confirming that modification is not required since both tests' content and items accurately and effectively capture the intended construct. Following this, any changes observed in the posttest scores are genuinely brought about by the application of the study treatment and not by chance or measurement error.

3.2.4.3.3 Piloting. Following the development and design of both tests, and before they were employed in the actual study, the pretest and posttest were administered to a small number of select pilot units belonging only to the target population (not included in the intended study sample). The pilot participants consisted of 10 third year students of English at Biskra University. Notably, both the pilot and main study's pretest and posttest were administered under as similar conditions as possible. After the completion of answering the tests, the students were asked to provide feedback regarding the clarity, understandability, relevance, and wording of test instructions, along with the time allotted to complete the tasks and any obstacles faced

while composing the paragraphs. The students did not report any irrelevancies, nor did they reveal any kind of problems related to test wording or structure.

3.2.4.3.4 Reliability. Reliability denotes the extent to which the results obtained from a data collection method can be replicated under the same or similar conditions. One way to achieve reliability in pretest-posttest studies that involve multiple raters assessing the same performance and dataset is through inter-rater reliability. In its simplest form, inter-rater reliability refers to the reproducibility or consistency of decisions between different raters. In other words, it signifies the degree of agreement among multiple evaluators measuring the same thing and how consistent the results obtained from them are. There is a set of statistical methods used to measure inter-rater reliability; each is more suitable under specific criteria. The selection is highly contingent upon the type of data.

In the current study, two raters (one is the researcher) were involved in the process of rating the pilot pretest and posttest. The assigned scores are illustrated in tables (See Appendix 8). Accordingly, and since the category of data is continuous in nature, the Intraclass Correlation Coefficient (ICC) is the best-suited statistical measure to examine the degree of agreement between the two raters' ratings (Bujang, 2017). The pilot pre and posttest scores assigned by the raters were set for Spss-driven analysis. Table and summarise the main results, emphasising the obtained intraclass correlation coefficient. As depicted in both tables, the reported Intraclass Correlation Coefficient (ICC) estimate is 0.90 and 0.85 for the cases of piloted pretest and posttest, respectively. This suggests a high and strong degree of agreement and consistency between the raters' assessments, therefore a high level of inter-rater reliability.

Table 3.3*Pretest Intraclass Correlation Coefficient***Intraclass correlation coefficient**

	Intraclass correlation ^b	95% confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	Df1	Df2	Sig
Single measures	.828 ^a	.412	.958	9.802	8	8	.002
Average measures	.906 ^c	.584	.979	9.802	8	8	.002

Table 3.4*Posttest Intraclass Correlation Coefficient***Intraclass correlation coefficient**

	Intraclass correlation ^b	95% confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	Df1	Df2	Sig
Single measures	.739 ^a	.204	.934	6.267	8	8	.009
Average measures	.850 ^c	.339	.966	6.267	8	8	.009

3.2.4.4 Student Post-Treatment Interview

Student interview was adopted as the final qualitative data collection method for the purpose of attaining the end aim that directs the methodology of this inquiry. It strives to collect in-depth insights and as much information about the qualitative part of the study. In essence, and following the completion of the study treatment, the researcher engages in a conversation and interaction with four students from the study sample, with a couple of questions asked verbally and face-to-face.

3.2.4.4.1 Aim and Structure. Broadly speaking, interviews strive to capture human behaviour and gain a rich and in-depth exploration of their perceptions and experiences. The target of the interview, in the realm of this study, is grounded in exploring and eliciting the attitudes of third year students of English at Biskra University towards the use of concept mapping in the planning stage of the writing process. This helps the researcher better understand the impact of the practical implementation of the concept mapping strategy on writing proficiency from the interviewee's point of view.

More than this, this method also wishes to figure out the interviewees' viewpoints regarding the improved writing elements, challenges in implementing concept mapping, and solutions to address these problems. The interview is semi-structured in nature and directed by a flexible and pre-prepared interview guide. Since the interview is predominantly set to collect insights and points of view, it is more likely to use open-ended questions with a total of ten items. Importantly, with basic and foundational knowledge about the interviewees already known to the researcher, the section of general knowledge was not incorporated in the interview guide.

3.2.4.4.2 Validation and Reliability. As part of its preparatory phase, the interview further needed to be validated and checked for reliability. In pursuit of these procedures, the interview underwent expert validation, where the interview guide was shared as a single word document via email to two instructors who were specifically chosen to review and assess the interview guide content as they were thought to be expert educators. They were requested to provide feedback on the basis of specific evaluation criteria and standards, given in a structured format or checklist. This tool also needed to be validated in order to probe the extent to which the interview measures what it is supposed to measure, in this case, students' attitudes, and to alleviate any ambiguity, redundancy, inconsistency, or repetition that might arise from the interview questions. None of the teachers reported any significant changes. Interestingly, in order to provide a logical and smooth flow of questions, one of them proposed adding one more question to the final form of the interview. With this in mind, the necessary modification was made.

3.2.4.4.3 Piloting. Similar to other data collection methods, the student interview protocol underwent a pilot phase, which is necessary to test and refine its content in terms of type and sequence of questions, clarity, understandability, and relevance before conducting it on a wider scale. For the pilot phase, and from the target population, two third year students of English at Biskra University were selected to be interviewed. These interviews are conducted with thorough note-taking, and the pilot students are also invited to share their thoughts and feedback. The provided comments were accurately reviewed, evaluated, and considered to find out and specify the areas that could be enhanced, thereby improving and finalising the interview guide.

3.2.5 Data Collection Procedures

While each step and stage of the research process should be performed in a structured manner and in accordance with strict guidelines, it is particularly imperative for data collection to comply with and follow a systematic and firmly established process and protocol. This is to gather sufficient and adequate information about the targeted variables of the research study. By applying a methodical approach to data collection, the researcher will not only be able to obtain and capture consistent, valid, and reliable data but also, and most importantly, to decrease and limit the effect of biases and errors. Within the framework of this study, the phase of data collection was systematically thought about, planned, and executed following a step-by-step procedure. This procedure may likely yield informed decisions with regard to multiple practices, instances of which are explicit research objective, quality control procedures, data collection methods, data documentation, and ethical considerations.

Data collection efforts, throughout the course of conducting this research, are directed by clearly defined and articulated research objectives that are established at the outset and have the potential to firmly and properly select the type of data collection methods. Key to data collection procedures is the employment of quality control metrics that involve taking steps to ensure the functionality and practicability of data collection methods and promote the integrity and consistency of the data. This was fundamentally achieved by pilot testing along with validation and reliability checks originally conducted on the four data collection methods, namely a student pre-treatment questionnaire, a teacher questionnaire, pretest and posttest, and a student post-treatment interview.

Another equally important procedure the researcher devotes attention to for effective data collection is ensuring complete and detailed records of the specificities pertaining to the data collection methods and process. This is especially achieved by thoroughly noting and documenting the tools' aim and structure, data collection dates and settings, any alterations made during the data gathering process, the treatment's lessons and tasks, and data gathering stages. In this context, the current research study is divided into three stages, each of which is characterised by the application of certain instruments to achieve particular goals. To explain, it goes through: (a) the pre-treatment phase or diagnostic stage (stage 1), which precedes the study treatment sessions; (b) the treatment phase (stage 2), which constitutes the actual study sessions; and (c) the post-treatment phase (stage 3), which takes place directly after the study treatment.

Central to the conduct of the current inquiry are ethical considerations. In particular, the researcher gives due consideration for maintaining that the criteria, such as informed consent, privacy, and respect, are collectively met throughout the data collection process, adhering to multiple guidelines and standards for ethical research. Informed consent, which has been signed, was required to verify agreement with the conduct and participation in the current study. It was first directed to the head of the English department, who gave his full approval for the treatment to be administered to third year students of English (See Appendix 2).

Secondly, it addresses the participants who made deliberate decisions about their willingness and intention to voluntarily partake as the research study's targeted sample. The informed consent letter attempts to inform the reader about the study, holding brief explanations of the subject matter, research objectives, required assignments, procedures, and research benefits. Clear descriptions in connection with the guaranteed and preserved rights, particularly those of identity, anonymity, privacy, respect, and withdrawal rights, were also explicitly stated.

3.2.6 Data Analysis Procedures

The current research is an attempt to examine the impact of using the concept mapping pre-writing strategy on writing performance in terms of content, organisation, and mechanics, on the one side, and to explore students' attitudes towards its use in the planning stage, on the flip side. It further limits itself to pinpointing the basic difficulties faced by EFL students while immersed in the writing task and discerning the possible factors underlying these writing struggles. Drawing on such study objectives, and in view of the Mixed-methods approach, both quantitative and qualitative methodologies are brought together.

To explain, and since this investigation reflects a mixed methods-based study, the researcher combines objective measurements and quantifiable data along with textual and non-numerical data, the analysis of which requires a mixture of procedures from both trends. That is, the examination and interpretation of quantitative and qualitative types of data collected in the course of this inquiry involves quantitative and qualitative data analysis procedures, techniques, and tools. Such methods contribute to identifying relevant information, making statistical inferences, uncovering emerging trends, and pinpointing specific patterns, thereby testing the research hypothesis and answering the research questions. In simpler terms, data analysis is conducted by means of statistical analysis and qualitative analysis.

Originally, statistical analysis, which is extensively implemented in this study to bring meaning to number-based form of data, involved descriptive and inferential statistics, each of which played a complimentary but distinguishable role. On top of that, descriptive statistics were rudimentary in organising, summarising, and describing the dataset. They were primarily manifested and represented not only in illustrative displays (histograms) but also in measures of frequency (frequency, percent, and counts), measures of central tendency (specifically the mean), and measures of dispersion or variation (specifically the standard deviation).

Inferential statistics, which establish the other essential follow-up procedure, serve to test the hypothesis and make inferences through the adoption of the paired samples t-test. The latter was deemed the most appropriate statistical test in the context of this study, for it was chosen on the basis of several factors, among which we mention the continuous and numeric type of data, comparison of one group's paired data, and the normal distribution pattern of data. It is important to note that the results of the test were arrived at through computational analysis, originally generated by the SPSS software package. Beyond statistical significance, and to evaluate the size of the effect of the study treatment on writing performance, the effect size, which is a standardised measure for the magnitude of mean differences, was subsequently computed.

Pertaining to the qualitative dimension of data, and in accordance with the study objectives, thematic analysis was especially applied for the analysis and interpretation of the non-numerical textual data that was mainly collected from the interview and from the questionnaire open-ended questions. In pursuance of the thematic analysis guidelines, we carried out a series of processes, the core of which is to label recurring concepts and assign themes. This procedure ranges from the initial step of familiarising oneself with the data to the subsequent, well-determined stages of generating codes, generating themes, reviewing themes, defining themes, and writing the findings.

Within this scope, coding signifies creating and assigning segments of data (pieces of text) to a category called code. In this respect, the interview manuscripts were set for computational coding using the MAXQDA computer software program, which allows the user to work on the data easily and smoothly. MAXQDA coding features allow researchers to systematically read, breakdown, and organise textual data into a hierarchically structured code system. With this tool, special attention is given not only to coding different data formats but also to importing the data, analysing it, and visualising the steps and findings.

3.2.7 Population / Sampling Technique

It is critical to draw attention to the fact that generalising findings is not the intention or target of our study. The present inquiry is not geared towards drawing general conclusions and inferences beyond the realm of the study's context or simply about the larger population. Chiefly, it involves the concern of planning research in order to address a particular research problem, driven by a selection of questions within a narrowed context. This is the reason why working with a limited number of participants or a small subset of units can be more practical, feasible, and manageable. The population of the study is broadly defined as students of English at Biskra University and instructors of English at Biskra University. Essentially, non-probability sampling was used in an effort to gather sufficient and pertinent data from a small number of units of interest that were initially part of the study's targeted and specified population.

In particular, non-probability convenience sampling was typically implemented to create the study sample, with 31 third year students of English at Biskra University and 10 teachers of the written expression course. The researcher selects a convenient and easily accessible participant group for the study on the basis of the convenience sampling technique. In other words, the study decides on the choice of participants based on their availability and ease of access. This results from the researcher's close involvement and presence with them as their classroom teacher. This sampling technique is thought to be the most efficient and convenient method of collecting data and achieving the goals of the study. Since this method may bring about the problem of bias, it is unlikely to produce a representative sample or generalise the obtained findings.

3.3 Study Description and Rationale

The objectives of the present research project are multifold, ranging from the attempt to investigate the impact of implementing the concept mapping pre-writing strategy on writing performance in reference to content, organisation, and mechanics to the endeavor to explore students' attitudes towards its application during the planning phase. It also confines itself to identifying the fundamental challenges that third year students of English at Biskra University encounter when engaging in the writing process and to uncovering potential causes behind these challenges. In order to accomplish the stipulated, precisely defined targets set forth, the study operates under a Mixed-methods approach with an embedded mixed-methods research design. Practically, to collect the necessary data, a mixture of quantitative- and qualitative-based data collection methods were adopted, including a student pre-treatment questionnaire, a teacher questionnaire, pretest and posttest, and a student post-treatment interview.

Chiefly, to gain a comprehensive understanding and a thorough grasp of the strategy's effect, data were analysed and interpreted by way of mixed-methods data analysis procedures. This study entails the implementation of a treatment that was fully designed, planned, organised, and delivered by the researcher herself, holding the roles of both teacher and investigator. For more clarity and detail, she originally takes on the combined responsibilities of an instructor, being the classroom teacher for the participant students, and a researcher, assuming the role of devising and administering the study treatment. This makes it easier to closely integrate the research activities and process with the classroom setting and teaching environment. It is pertinent to point out that, for close participant-researcher interaction, the study was performed in an educational classroom setting over the course of three months. What follows provides an accurate description of the study's treatment, stages, procedures, materials, and tasks.

3.3.1 The Treatment Implementation/or The Educational Phenomenon Description

With regard to the practical application of the concept mapping strategy in the context of this research work, the researcher seeks an integrated learning treatment that is not only lesson-based but also, and more importantly, activity-centered. This essentially means the typical blend of theoretical foundational knowledge of the particulars of concept mapping, in the form of planned lessons, with the practical application of this knowledge, in the form of engaging activities. The targeted intervention was scheduled to be delivered over the course of 19 face-to-face classroom sessions (60 minutes per session; once or twice per week), encompassing those of the pretest and posttest.

To effectively communicate the purpose of the treatment, a five-lesson mini-syllabus was elaborated under the direction of an instructor, who is acknowledged to be experienced and knowledgeable in the field. The teacher provides insights into how to effectively design syllabi with a merged focus on both lessons and tasks within the purview of learning objectives. The mini-syllabus is, therefore, initiated by a brief illustration of the instructor's name and contact information, class meeting dates and times, course description, course objectives and learning outcomes, course materials, way of announcements, assessment procedure, and references used. For more explanation, the pre-planned study syllabus (See Appendix 13) incorporates a series of lessons, classroom discussions, writing assignments, and concept mapping tasks. Predominantly, each of the designed lessons was methodically carried out over a specific period in at least one-hour sessions. Each lesson is accurately described with a predetermined level of detail, portraying essential information with respect to lesson title, date, lesson objectives, lesson content, teacher role, student role, activities and tasks, homework, resources and materials, and references. It is important to note that the computer map-making tool adopted to generate concept maps is CmapTools.

3.3.1.1 Lesson One

Among the collection of lessons, the first one, which is conceived as an introductory session, is entitled ‘Introduction to Written Expression: Background and Strategies’. As its title suggests, this three-part lesson strives to inform and diagnose students’ prior knowledge of the skill of writing and whether they maintain a good grasp of its fundamentals and component elements. Reviewing the existing state of knowledge also enables the researcher to make the most apt and relevant connections with the new content. The first part of this lesson revolves around writing as a skill, comprising writing definition, types, and fundamental competences of quality writing. Clearly, the second part places emphasis on paragraph writing, pointing its definition, types, structural elements, characteristics of a good paragraph, and writing process stages. The third part, however, introduces writing strategies, in general, and pre-writing strategies, in specific, establishing their definition, importance, categories, and examples.

3.3.1.2 Lesson Two

The second lesson is identified as ‘Concept Mapping Guide and Tutorial’. It is devoted to conducting a detailed presentation of the specificities of concept mapping to the students, who were almost unknowledgeable about it. The explanation begins with the most basic elements, such as its definition, origins, kinds, characteristics, creation steps, and applications, and develops its way gradually toward outlining the main process and steps that can be applied to properly construct a concept map.

3.3.1.3 Lesson Three

The follow-up lesson strives to provide ample practice to better help the students with their concept mapping skills since the strategy is new to them, bearing the title of ‘Practicing Concept Mapping’. The researcher begins with displaying further samples and instances of both simple and elaborate concept maps to the students and prompting them to discuss their structure and content. The participants were subsequently given another task requiring them to thoughtfully read a passage on ‘carbohydrates’ and individually complete the partially constructed concept map provided. The next fill-in-the-nodes activity helps the students critically read through the map to specify the most suitable responses, to be placed inside nodes, from a wide range of available options. A similar fill-in-the-map exercise with missing links and linking phrases was also selected to emphasise the significance of connections and interconnections in the map's understandability.

3.3.1.4 Lesson Four

Another equally important lesson is the fourth, which goes by the title ‘Collective Concept Maps and Assessment’. Students are instructed to work in pairs to draw a concept map on the basis of the provided reading passage. Following the completion of the maps, they were instigated to exchange the final work with another pair of students for correction and improvement. For peer review, students were supplied with a concept mapping scoring rubric (See Appendix 14) with which the map's constituting elements, organisation, accuracy, and degree of understandability, along with the corresponding assigned sub-scores, are clearly and comprehensively detailed in a table. This lesson enables students to collectively generate and assess concept maps before being able to independently construct them. This collaborative activity also allows for profound discussion and view sharing.

3.3.1.5 Lesson Five

Since the fifth lesson is identified as ‘Concept Maps and Prior Knowledge’, it is clear that the researcher's focus is directed towards revealing the efficacy of concept mapping in activating prior knowledge about the writing topic. A task was designed to help students activate their pre-existing knowledge and construct preliminary concept maps that best represent what they already know about the issue (five human senses). They were later instructed to employ the provided short passage to expand, elaborate, and refine the generated concept maps.

3.3.1.6 Lesson Six

This part of the designed syllabus focuses on improving the ability to transform written text into a readable, well-constructed map; therefore, it is titled ‘from text to a concept map’. Achieving the objective of this lesson is made possible by providing the participants with a reading excerpt and asking them to read it and map its parts to obtain a comprehensive concept map. At this stage, to better practice the practical implementation of concept mapping, a homework assignment was provided.

3.3.1.7 Lesson Seven

Lesson seven strives to prepare the students to build the ability to construct efficient concept maps independently, moving from a complete concept map. Specifically, and operating as a pre-writing tool, an elaborate concept map about smoking was supplied, holding the theme, supporting ideas, and examples. The students were asked to write a short, three-idea paragraph on why smoking should be banned, and they were left the room to elaborate on three supporting ideas.

3.3.1.8 Lesson Eight

Although it provides further practice in map creation, lesson eight turns out to be an indicator of autonomous concept map construction skill. With this aim in mind, the researcher set students to independently and individually map out and brainstorm supporting ideas and examples about sports and their importance in daily life by constructing a complete concept map. Following this, along with the guidance of the teacher, who provided a set of prompts to choose from, students engaged in drafting paragraphs that aligned with the constructed maps. The second task establishes a similar purpose of engaging students in paragraph writing about the importance of reading books for academic success after concept mapping generation, but without any prompts provided.

3.3.2 The Stages / or Procedures

The present research is a short-term study that involves a total of nineteen 60-minute sessions, carried out over the course of three weeks. This encompasses all scheduled class meeting times, including those of the pretest, posttest, questionnaire completion, treatment administration, and interview conduct. This investigation is structured into three diverse, yet interdependent stages, with each contributing to and corroborating the findings of another. Such stages hold critical roles in the carrying out and completion of the study, thereby answering the raised research questions. To maintain a systematic approach to reaching the study objectives and gathering relevant data, this research undergoes (1) a pre-treatment phase, (2) treatment phase, and (3) post-treatment phase.

3.3.2.1 Pre-treatment Phase

The pre-treatment phase represents the significant first or preliminary research phase, during which essential procedures, such as informed consent and assigning the study participants, were set up and carried out prior to the actual beginning of the treatment. During this stage, the researcher aims to collect baseline data to answer the first two research questions, probing into the main difficulties encountered by third year students of English at Biskra University while engaged in the writing task, as well as the most prevalent causes of these difficulties. For data gathering, analysis, and interpretation, an array of gathering methods and analysis procedures were adopted after undergoing essential quality control measures. These yield a student pre-treatment questionnaire, a teacher questionnaire, descriptive statistics, and thematic analysis. Another critical objective of the pre-treatment phase is to measure students' writing ability in terms of content, organisation, and mechanics prior to the implementation of the actual study sessions. This was accomplished by means of a pretest that required the participants to write a paragraph of about 10 to 12 lines, elucidating the effects of online learning on student achievement.

3.3.2.2 Treatment Phase

The follow-up stage involves the part of the study where the treatment is conducted and administered to the intended participants. That is, it implies the real implementation of the treatment, involving introducing and practicing the concept mapping strategy through a sequence of pre-planned study sessions. Along with consistent practice, such sessions present the specificities of concept mapping to the students, such as its definition, origins, kinds, characteristics, creation steps, and applications, and develops its way to outline the main process and steps that can be applied to properly construct this diagram. This stage is characterised by the elaboration of an eight-lesson mini-syllabus designed to be delivered in 19

60-minute face-to-face classroom sessions. This syllabus is not only theoretical in nature but also activity-centered, with a total number of 12 tasks. This essentially means the typical blend of theoretical foundational knowledge of the particulars of concept mapping, in the form of planned lessons, with the practical application of this knowledge, in the form of engaging activities

3.3.2.3 Post-Treatment Phase

The post-treatment phase takes place following the completion of the intervention to participants. During this stage, and guided by the third and fourth research questions, the researcher evaluates the impact of the concept mapping treatment on students' writing abilities, as well as explores their attitudes with regard to its implementation. This stage is initiated by and concluded with the administration of a posttest, which was carried out following the treatment. The posttest seeks to establish the participants' skills, knowledge, and performance in writing in terms of content, organisation, and mechanics after the treatment takes place.

It is important to note that the two forms of assessment (pretest and posttest) follow the same criteria in connection with accessibility, structure, format, difficulty level, timing, and administration procedures. This also involves consistency in the criteria used for evaluating both tests, within the framework of an identical writing analytical scoring rubric. To maximise the reliability and accuracy of the data collected and to reduce bias that may result from a single assessment, two raters were involved in rating student writing performance across both tests. The student interview was the final qualitative data collection methods as part of the post-treatment phase. During the course of conducting the interview, the research was guided by a flexible, structured outline (interview guide). This document ensures that all essential questions are addressed, offering a framework for maintaining focus on the areas of interest.

Conclusion

The present chapter overviews the fundamental methodological elements required to provide a solid foundation for any investigation, ranging from the research paradigm, as a philosophical aspect, to data analysis procedures, as a practical consideration. It subsequently specifies and defines the collection of methodological decisions that are most appropriately suited for the nature and aim of this particular study, along with the rationale for these selections. Chiefly, it also detailed the methodical approach adopted in gathering sufficient and adequate information about the targeted variables of the research study. To better explain the treatment applied in the course of this study, the chapter further goes on to describe and outline the treatment implementation, documenting its stages, processes, and methods sequentially, from the initial step to its completion.

Chapter Four: Results and Analysis

Introduction

4.1 Analysis of Students' Pre-treatment Questionnaire

4.2 Analysis of Teachers' Questionnaire

4.3 Analysis of Tests

4.3.1 Descriptive Statistics, Inferential Statistics, Effect Size for Overall Writing

Performance

4.3.1.1 Descriptive Statistics for Overall Writing Performance

4.3.1.2 Inferential Statistics for Overall Writing Performance

4.3.1.2.1 Checking Normality

4.3.1.2.2 Paired Samples T-test

4.3.1.3 Effect Size for Overall Writing Performance

4.3.2 Descriptive statistics, Inferential Statistics, Effect Size for Content,

Organisation, Mechanics

4.3.2.1 Descriptive Statistics for Content, Organisation, Mechanics

4.3.2.2 Inferential Statistics for Content, Organisation, Mechanics

4.3.2.3 Effect size for Content, Organisation, Mechanics

4.4 Analysis of students' Interview

4.4.1 Content

4.4.2 Syntax

4.4.3 Purpose and Topic

4.4.4 Organisation

4.4.5 Writing Process

4.4.6 Mechanics

Conclusion

Introduction

Following the previous two chapters, which revolved around and introduced specificities regarding the concept mapping strategy and writing performance, this chapter is especially designed to exhibit a comprehensive compilation of the collected datasets and showcase a complete display of all obtained results throughout the course of the inquiry. This step is integral to comprehensively responding to the research questions and arriving at informed conclusions. Through this chapter, an attempt is made to provide a thorough and complete analysis of qualitative and quantitative data. In this respect, a particular attention is directed to the employed data analysis procedures. This later involves the collection of analytical methodologies, statistical instruments, and computational software applications used to explore, analyse, and interpret different sets of data.

4.1 Analysis of Students' Pre-treatment Questionnaire

Section One: General Information

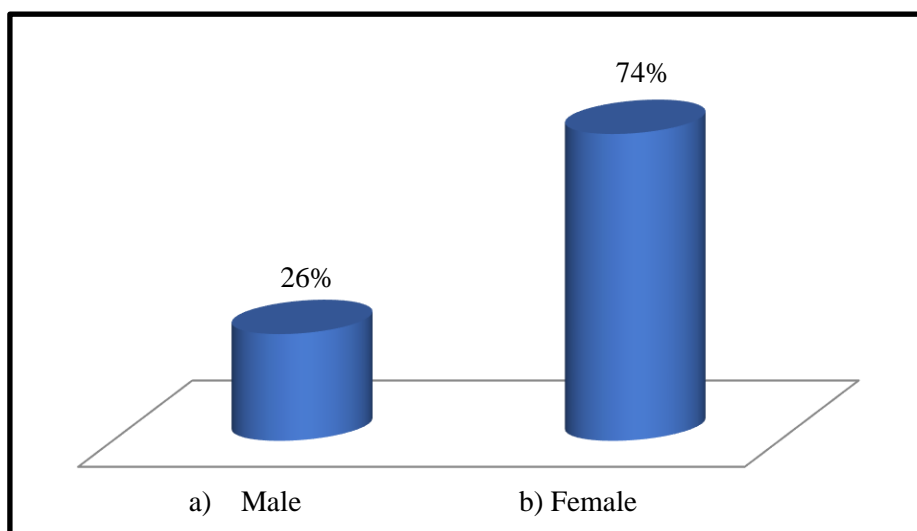
The analysis of students' pre-treatment questionnaire involves analysing the three sections using descriptive statistics, tables, and graphs.

Item 1. Would you specify your gender:

The first item principally accounts for gender distribution in the study in order to know about and provide a more comprehensive understanding of the composition of the sample. A summary of the responses to the question is presented in Table 4.1 and Graph 4.1. Observably, it is indicated that the number of females and males is not balanced, with the former outnumbered the latter. Out of 31 participants (100%), 23 (74%) were females and only eight (26%) were males. Clearly, the number of females is almost three times the number of males.

Table 4.1*Gender Distribution*

Option	Number	Percentage
a) Male	8	26%
b) Female	23	74 %
Total	31	100%

Figure 4.1*Gender Distribution***Item 2. Which language skill do you find most challenging?**

Since the complexity of language skills might vary for different individuals, the second item strives to specify the number of respondents who struggle with listening, speaking, reading, or writing, thereby determining the most challenging language skill for the study sample. The results are manifested in Table 4.2 and Figure 4.2. It is clear that none of the language skills was chosen by all the participants. Nevertheless, two skills, namely speaking and writing, were equally selected by 12 students, representing 38.71%. Four students (12.90%) opted for listening while two opted for reading (6.45%). In addition, only one student

chose both speaking and writing, with a percentage of 3.23%. This simply explains the perceived difficulty of productive skills for students compared to receptive skills.

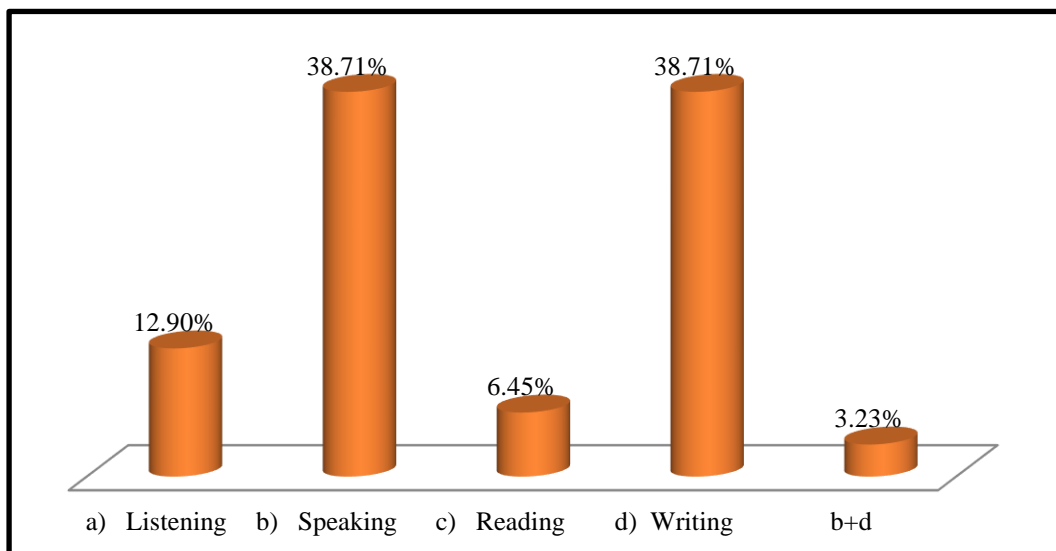
Table 4.2

Most Challenging Language Skill

Option	Number	Percentage
a) Listening	4	12.90%
b) Speaking	12	38.71%
c) Reading	2	6.45%
d) Writing	12	38.71%
e) b+d	1	3.23%
Total	31	100%

Figure 4.2

Most Challenging Language Skill



As part of their answers, the students were left the room to provide justifications for their choices and express their challenges. A brief overview of some of the students' justifications is as follows:

For “Listening”

- *I find that speaking is the most challenging skill because when I listen to the teacher and someone makes noise, I lose my concentration.*
- *I am a visual learner. I should see who is talking and see the context and sentences. I cannot focus on listening.*
- *I cannot concentrate easily with the teacher or the speaker. I easily get distracted.*

For “Speaking”

- *I have a lack of information when speaking and the ideas just go away.*
- *When I speak, most of the time I stutter while speaking in English and I don't pronounce well.*
- *Because when it comes to speaking, I start thinking about pronunciation, grammar mistakes, tone in conversation, and word choice.*
- *I find that speaking is the most challenging skill because I don't have anyone to practice English with. So, when it comes to talking in English, I face a lack of words and feel strange.*
- *Most of the time, when speaking, I feel embarrassed.*
- *When speaking, ideas are easily forgotten.*
- *As a person who has a little bit of social anxiety, I find it hard to talk in front of a group of people. It is not something that cannot be fixed or is so hard and complicated yet; it is challenging a bit for me.*

For “Reading”

- *I have difficulty with reading because I cannot remember what I read or what I see, like images.*
- *Because I have a problem with vocabulary.*
- *When I read, I do not understand the text.*
- *I take a long time reading the text, so I do not finish the exam.*
- *When I read, the whole text seems important to me. I cannot decide about the most important thing.*
- *I cannot concentrate when I read.*
- *I do not like reading because I am afraid I cannot understand the text.*

For “Writing”

- *For me, writing is really difficult because I generally struggle to provide ideas for certain topics since I don't have background knowledge about them.*
- *I have a problem with spelling.*
- *Because writing depends on grammar and rules; I face some difficulties.*
- *I don't know, but I find it very difficult, especially when I am restricted by certain topics or conditions.*
- *When I am writing, I mix the ideas with each other because I have many ideas.*
- *I have difficulties with sentence structure.*
- *For me, writing is the most difficult of the four skills because it requires all three skills in order to master it.*
- *I have difficulties that I cannot fix or find a solution to. I cannot have good ideas and I cannot write organised paragraphs.*
- *My problem is about ideas. I do not have ideas when I write.*

It is apparent that the respondents exhibit a wide spectrum of distinct challenges with regard to different language skills. As for listening, they particularly have trouble with concentration and focus. The respondents who confront hurdles in speaking have pronunciation issues, vocabulary limitations, lack of ideas, grammatical errors, word choice, lack of confidence, and social anxiety. According to the respondents, potential obstacles in reading can be commonly manifested in the difficulty of retaining information, limited vocabulary, poor comprehension, slow reading speed, inability to identify key ideas, reading anxiety, and lack of concentration. For those who experience problems while engaged in writing, they tend to encounter prevalent challenges in spelling, grammar, idea generation, background knowledge, and organisation.

Section Two: Writing Performance

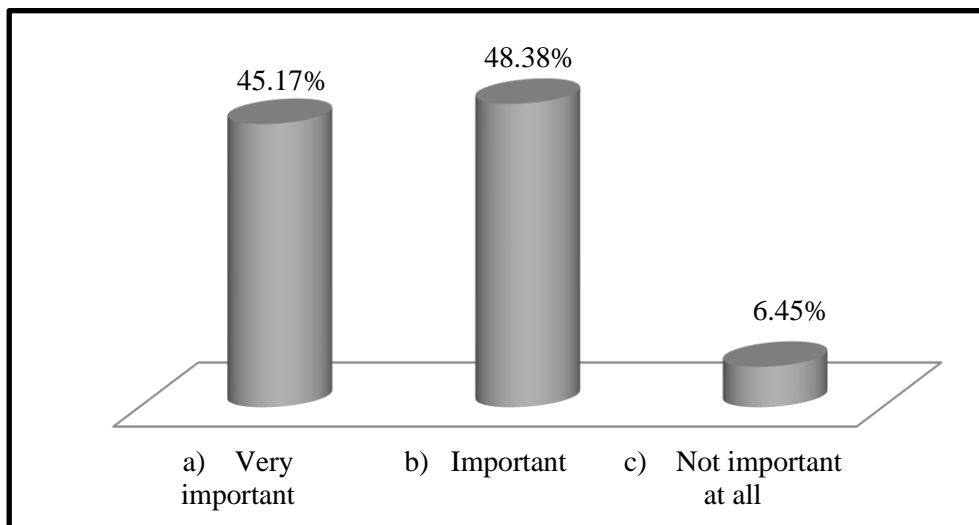
Items 3 and 4 fundamentally involve gauging students' views on the importance of writing, enquiring about students' enjoyment of writing, and specifying the language they predominantly use for writing. A tabulated summary of the responses is presented in Tables 4.3, 4.4, and 4.5. The results are also graphically depicted in figures 4.3, 4.4, and 4.5, respectively.

Item 3. How do you consider the writing skill?

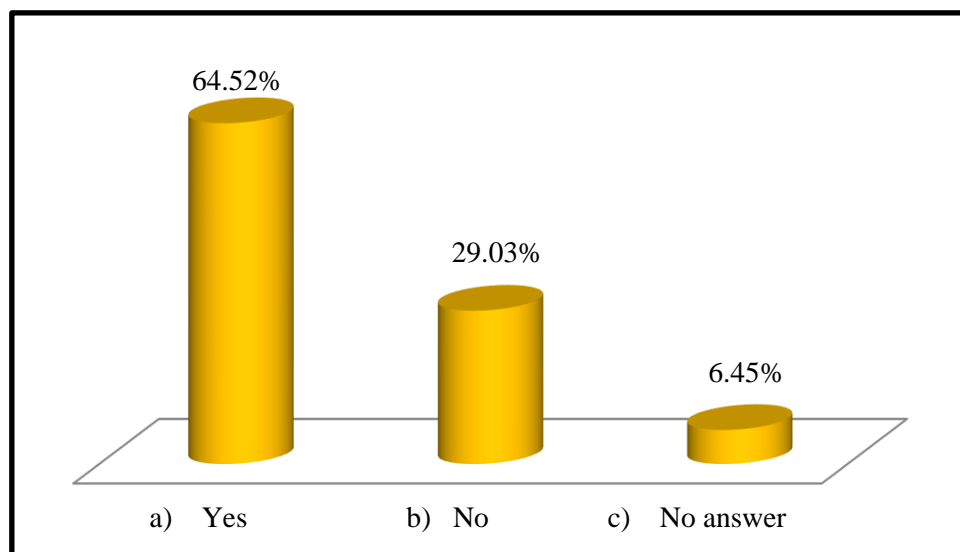
Table 4.3

Students' Opinions about the Importance of the Writing Skill

Option	Number	Percentage
a) Very important	14	45.17%
b) Important	15	48.38%
c) Not important at all	2	6.45%
Total	31	100%

Figure 4.3*Students' Opinions about the Importance of the Writing Skill***Item 4. Do you enjoy the time you spend writing?****If yes, in which language are you mostly used to write?****Table 4.4***Students' Enjoyment with Regard to Writing*

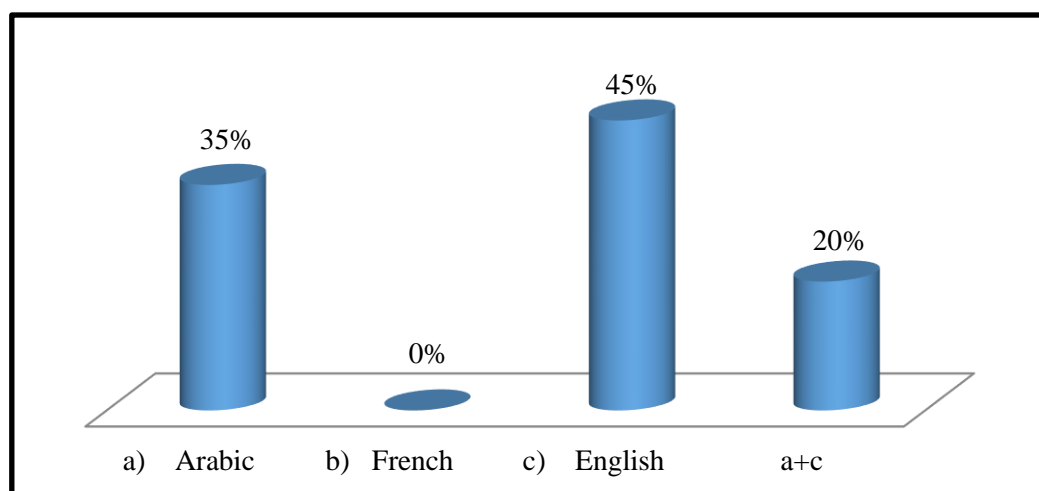
Option	Number	Percentage
a) Yes	20	64.52%
b) No	9	29.03%
c) No answer	2	6.45%
Total	31	100%

Figure 4.4*Students' Enjoyment with Regard to Writing***Table 4.5***Language Students Mostly Prefer to write in*

Option	Number	Percentage
a) Arabic	7	35%
b) French	0	0%
c) English	9	45%
d) a+c	4	20%
Total	20	100%

Figure 4.5

Language Students Mostly Prefer to write in



It seems, according to the answers provided in item 1, that the majority of respondents (29) believe that the writing skill is essential, selecting either 'very important' (45.17%) or 'important' (48.38%). Only two respondents (6.45%) perceive writing as lacking importance. They are less likely to value the writing activity, yielding negative attitudes towards it. Importantly, the vast majority of students (20, representing 64.52%) appear to find pleasure in writing and enjoy their writing experiences. Nevertheless, this is not the case for nine students (29.03%) who opted for 'no', meaning that they do not enjoy their writing time. Identifying students' enjoyment of writing has far-reaching advantages. When students are intrinsically motivated, they are more likely to comprehend the activities, perform the tasks, and engage with the treatment's content and materials voluntarily.

Additionally, and due to unidentified reasons, two respondents (6.45%) refrained from responding to the question, leaving the item unanswered. Following this, and based on table 3.4.1, it seems that English is the most popular and widely used language for student writing. In other words, nine students (45%) choose English as the primary medium of written communication. In addition, seven students (35%) use Arabic as the language of written

expression. Chiefly, four students (20%) are more inclined to use Arabic and English. French, however, represents 0%, for it has not been adopted by students in their writing endeavors.

Item 5. How often do you write in English?

Items 5 and 6 were designed to uncover the frequency of writing in English and the motives that generally prompt students to specifically choose to write in English, respectively. A summary of the responses to the inquiry is presented in Tables 4.6 and 4.7, as well as Figures 4.6 and 4.7.

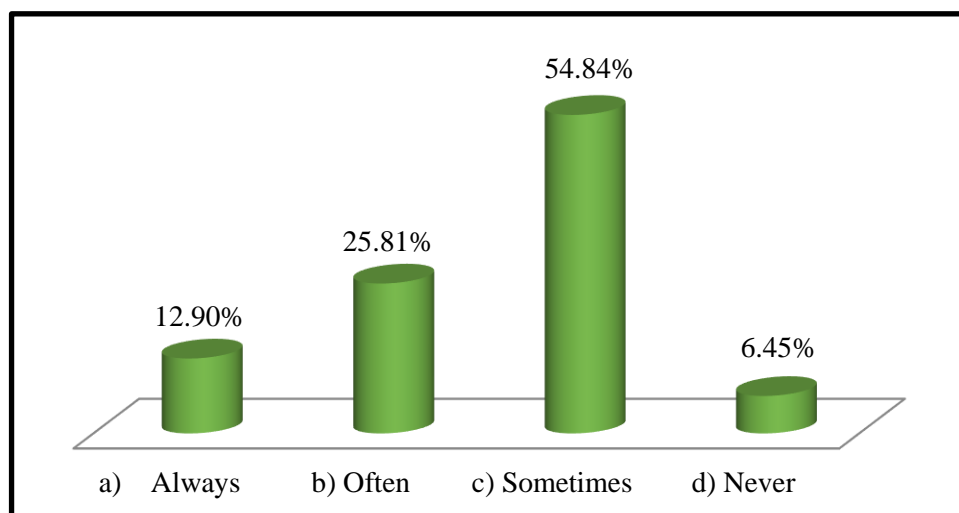
Table 4.6

The Frequency of writing in English

Option	Number	Percentage
a) Always	4	12.90%
a) Often	8	25.81%
b) Sometimes	17	54.84%
c) Never	2	6.45%
Total	31	100%

Figure 4.6

The Frequency of writing in English



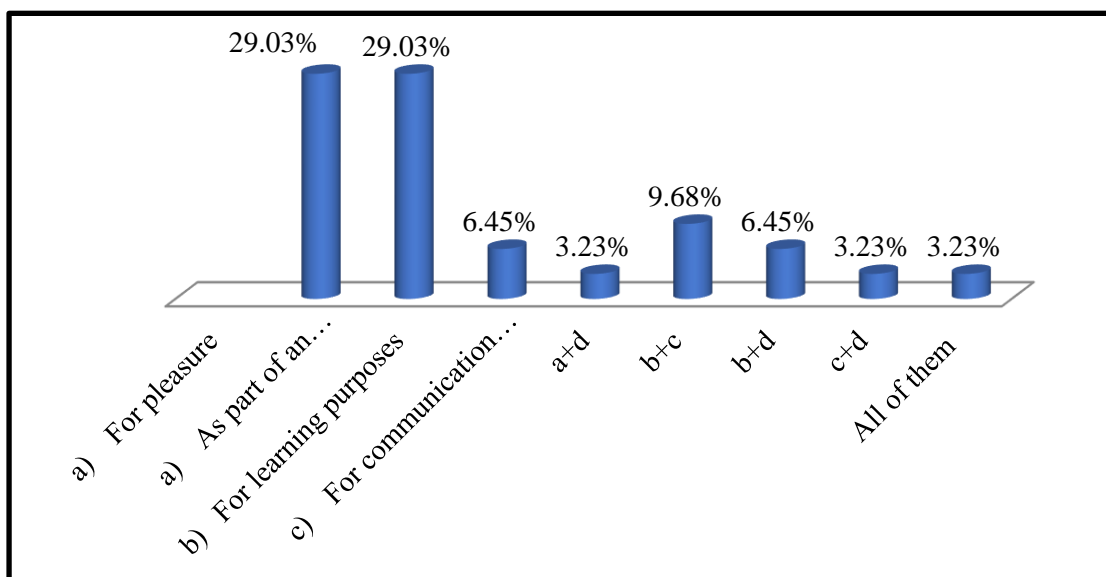
Analysing how often students engage in writing in English can not only provide valuable insights into their academic performance, but it can also be indicative of students' overall language proficiency. Observably, only four students (12.90%) indicate 'always' as the answer to the question, denoting their consistent and regular writing practice in English. While eight students (25.81%) choose 'often', two other ones (6.45%) opt for 'never'. Importantly, however, a large number of students (17 students representing 54.84%) select 'sometimes' to clearly manifest that they engage in English writing from time to time.

Item 6. Why do you generally come to write in English?

Table 4.7

Reasons Behind Writing in English

Option	Number	Percentage
a) For pleasure	3	9.68%
a) As part of an assignment	9	29.03%
b) For learning purposes	9	29.03%
c) For communication purposes	2	6.45%
a+d	1	3.23%
b+c	3	9.68%
b+d	2	6.45%
c+d	1	3.23%
All of them	1	3.23%
Total	31	100%

Figure 4.7*Reasons Behind Writing in English*

Recognising why students come to write in English represents another equally important item, for there are several underlying reasons behind the act of writing, ranging from the desire for self-expression and communication to the willingness to conveying information and personal development. Table 4.7 and Figure 4.7 offer a brief overview of the feedback received as an answer to the inquiry. While the data appear to indicate that most students (18, representing 58.06%) write in English as part of an assignment (29.03%) or for learning purposes (29.03%). That is, writing for academic purposes constitutes the major motivation for writing in English.

It is important to consider the other factors leading students to write in English, such as the desire for communication (selected by two students) or personal interest (selected by three students). In evaluating the responses, it is evident that only one student addresses all the possible and provided aspects of the question. Among the students, as outlined in Table 4.7, some could potentially provide varied comprehensive answers by ticking more than one option, such as selecting 'as part of an assignment' and 'for communication purposes' (chosen by two students, 6.45%).

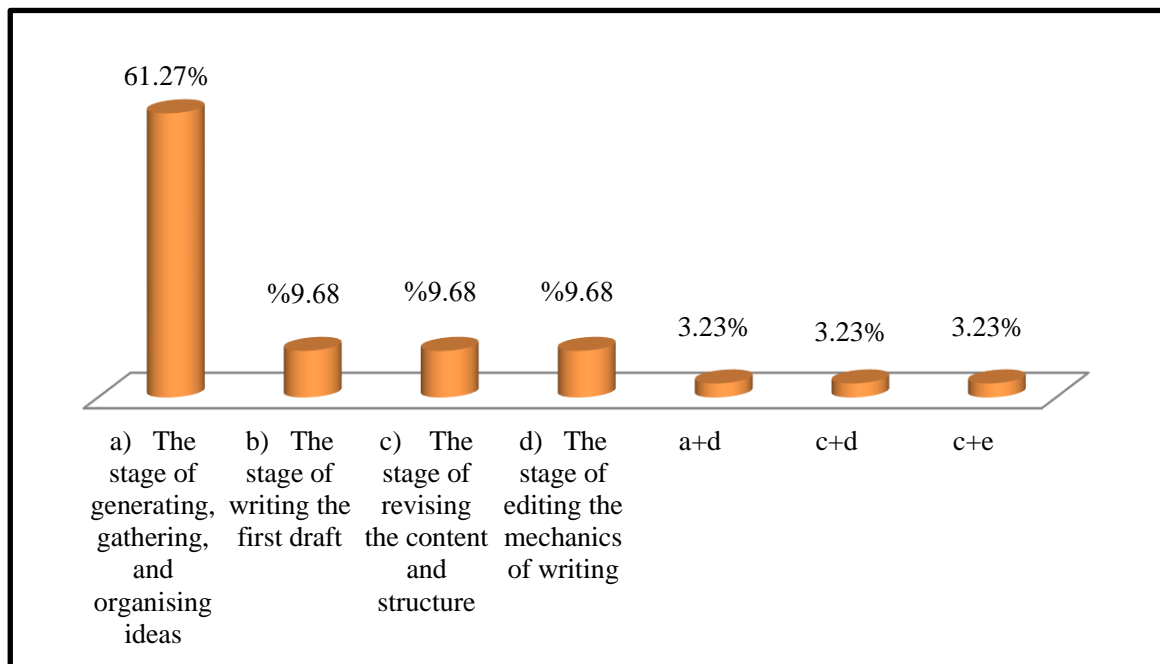
Item 7. Which of the following writing stages do you find most challenging?

Item 7 seeks insight into the writing stage(s) students typically find most challenging. Table 4.8 encapsulates the feedback received in response to the question. Figure 4.8 also highlights key findings. Among other options, the stage of generating, gathering, and organising ideas was the most commonly chosen response, selected by a significant majority of participants (19, representing 61.27%). It seems that exploring and structuring thoughts during pre-writing, or simply getting started, stands out as the most formidable and demanding phase in writing. It is evident that the percentage of the responses b, c, and d is equal, which is also the second highest one (9.68%). That is, some of the students' writing challenges also lie in the phases of drafting, revising, and editing. A common challenge among students is that they struggle with more than one writing stage. They face challenges in multiple stages of writing: one student (3.23%) selects (a+d), one student (3.23%) chooses (c+d), and one student (3.23%) opts for (c+e).

Table 4.8

The Most Challenging Writing Stage

Option	Number	Percentage
a) The stage of generating, gathering, and organising ideas	19	61.27%
b) The stage of writing the first draft	3	9.68%
c) The stage of revising the content and structure	3	9.68%
d) The stage of editing the mechanics of writing	3	9.68%
a+d	1	3.23%
c+d	1	3.23%
c+e	1	3.23%
Total	31	100%

Figure 4.8*The Most Challenging Writing Stage***Item 8. Do you have any writing struggles or difficulties?****If yes, please specify them**

Building on the previous item, the current question was expressly included with the intention of gaining a clear understanding of students' hindrances to writing. It aims to pinpoint precisely their common writing challenges, allowing them, first, to choose from a wide and varied assortment of options and, second, to openly express and share any additional concerns or struggles they encounter in writing. Key results and observations are illustrated in Tables 4.9, 4.10 and Figures 4.9, 4.10. Observably, the fact that all the students affirmatively selected 'yes' signals shared prevalent writing challenges. This is particularly expected when emphasising the inherent complexity of writing as a skill, which is especially true for non-native learners. Fundamentally, some participants were genuinely interested in choosing the responses 'e' (six respondents =19.34%) and 'f' (one respondent =3.23%), indicating a notable

lack of ideas about the writing topic or theme, as well as the difficulty with prior knowledge activation, respectively.

Writers frequently experience writer's block, demonstrating the significant hurdles of pre-existing knowledge activation and idea scarcity (shortage). This often hinders the generation of content and the creation of fresh, original, and engaging thoughts. Another recurring challenge in writing is the difficulty with word choice, being selected by four participants (12.89%). It is indeed the case for many writers who struggle to achieve precision in lexical selection, finding it critically difficult to select the most fitting words or expressions to effectively convey the precise meaning. Furthermore, four students (12.89%) went with the answer 'd', expressing the challenge of organising and connecting ideas in a logical sequence as the response to the question.

Constructing a logical sequence for ideas adds to the overall effectiveness and flow of the written text. Writing mechanics (already chosen by three students, 9.68%) along with sentence structure (initially selected by two students, 6.45%) may also pose a challenge in writing. Too often, a high-quality written communication reflects a good command of writing mechanics, yielding proper and sound grammar rules, punctuation, layout, and spelling. According to the table and figure, out of 31 participants, 11 respondents face various writing difficulties and find themselves struggling with multiple writing aspects; therefore, they picked out more than one option (a+d, a+e, b+e, c+e, d+e, e+f, and d+e+f).

Table 4.9*Existence of Writing Struggles*

Option	Number	Perecentage
a) Yes	31	100%
b) No	0	0%
Total	31	100%

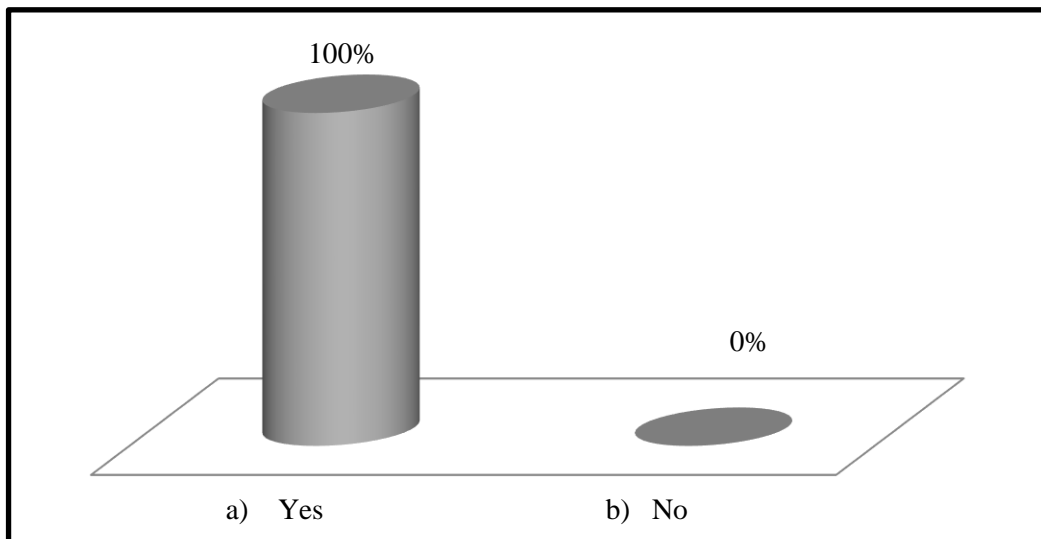
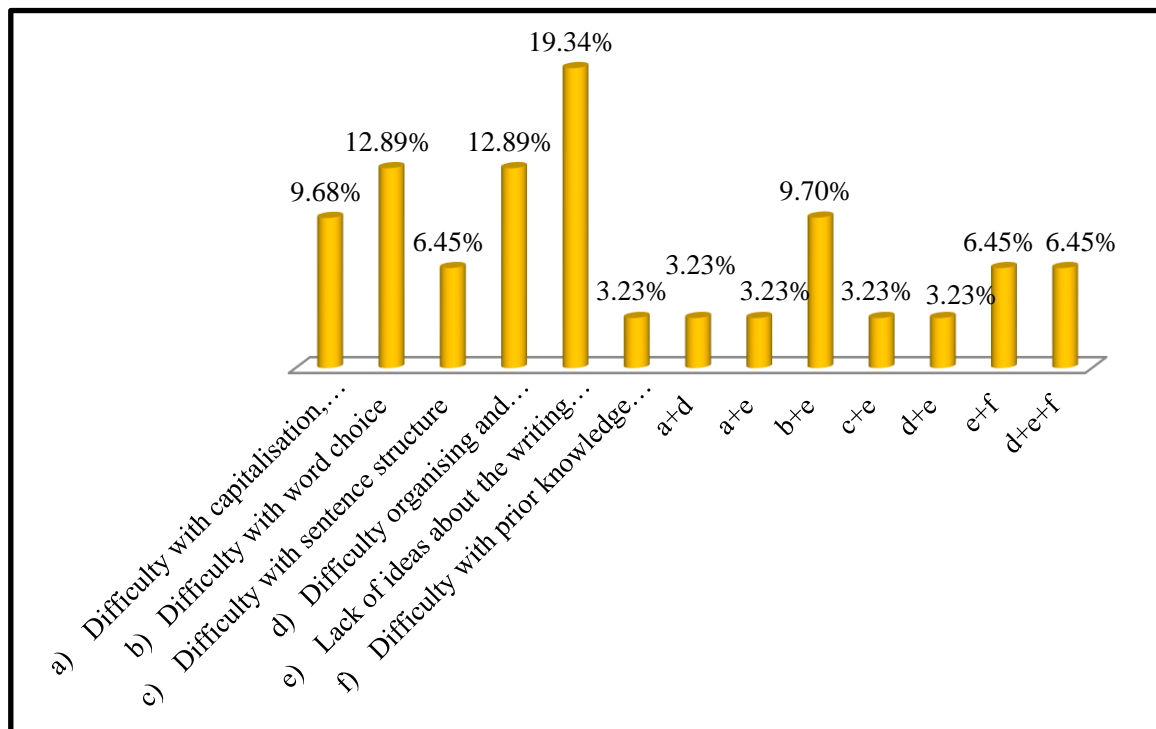
Figure 4.9*Existence of Writing Struggles*

Table 4.10*Specification of Students' Writing Struggles*

Option	Number	Percentage
a) Difficulty with capitalisation, punctuation, layout, and spelling	3	9.68%
b) Difficulty with word choice	4	12.89%
c) Difficulty with sentence structure	2	6.45%
d) Difficulty organising and connecting ideas in logical sequence	4	12.89%
e) Lack of ideas about the writing topic or theme	6	19.34%
f) Difficulty with prior knowledge activation	1	3.23%
a+d	1	3.23%
a+e	1	3.23%
b+e	3	9.70%
c+e	1	3.23%
d+e	1	3.23%
e+f	2	6.45%
d+e+f	2	6.45%
Total	31	100%

Figure 4.10*Specification of Students' Writing Struggles*

Item 9. How much do you agree that background knowledge has great importance for the quality of your writing?

The intention behind this item is to gauge students' knowledge and awareness of the role and importance of background knowledge in their writing effectiveness. In accordance with the information presented in the Table 4.11 and Figure 4.11, it is evident that none of the students opted for 'strongly disagree' (0%), 'disagree' (0%), or 'neutral' (0%). Instead, all the students do recognise the relevance and essentiality of background knowledge in optimising their writing quality. This is especially true as the total number of 31 respondents uniformly expressed agreement, selecting either 'strongly agree' (22 students making up 70.97%) or 'agree' (nine students making up 29.03%). None of the students opted for 'agree'. In essence, this can be explained by the fact that writers with good and solid background knowledge of the

subject matter can better generate thorough ideas and well-supported arguments, drawing upon this knowledge to produce compelling and informative texts.

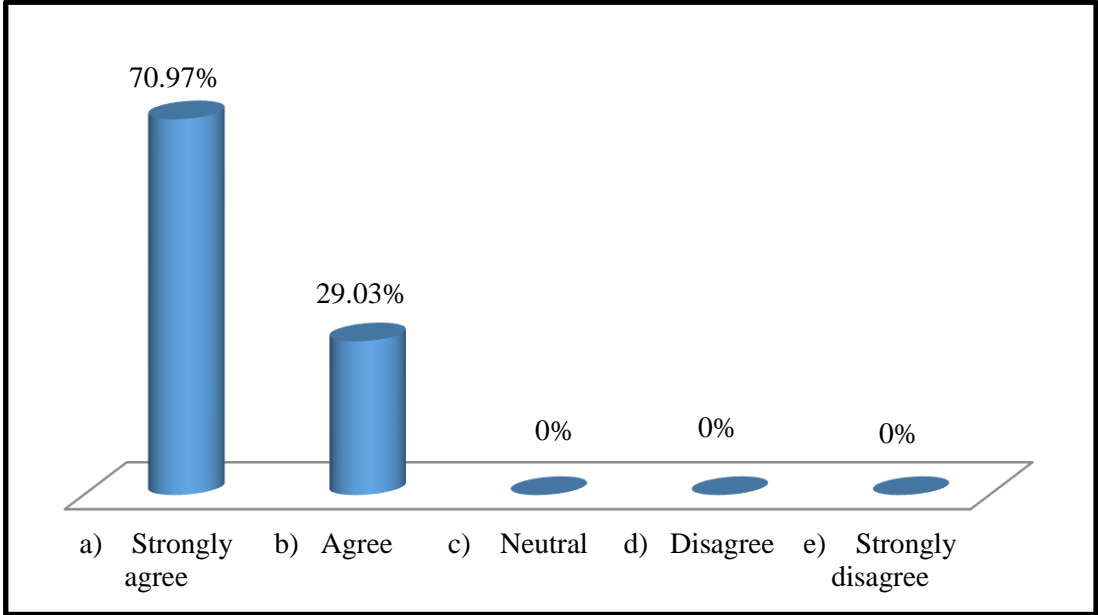
Table 4.11

Background Knowledge and the Quality of Writing

Option	Number	Percentage
a) Strongly agree	22	70.97%
b) Agree	9	29.03%
c) Neutral	0	0%
d) Disagree	0	0%
e) Strongly disagree	0	0%
Total	31	100%

Figure 4.11

Background Knowledge and the Quality of Writing



Item 10. Once you decide to start writing a passage, and as a way of prior knowledge activation, do you plan out in advance to use a given strategy or technique?

If yes, what do you usually use?

Prior to inquiring about students' utilisation of the targeted strategy (concept mapping), it is significant to strive to explore and gain insight into what they usually embrace as specific pre-writing strategies, which is why this two-part item was designed. A compilation of the responses to the question is presented in Tables 4.12 and 4.13, as well as Figures 4.12 and 4.13. Nine students (29.03%) marked 'no', signifying a lack of strategy usage. They appear to initiate composing texts directly without any preceding planning on the use of specific pre-writing strategies or techniques. Nevertheless, 22 students (70.97%) responded positively and affirmed planning out their writing tasks in advance.

As observed, freewriting is the primary choice for the greater part of respondents (13 students, or 59.05%), while only three, equivalent to 13.65%, lean towards brainstorming. This can be attributed to the fact that freewriting can serve as an effective tool for generating varied ideas and enhancing the flow of thought, without worrying about the irrelevancies of structure or grammar. This makes it accessible and uncomplicated to be employed. Chiefly, none of the respondents (0%) indicated a preference for questioning, clustering, researching, or graphic organisers. Surprisingly, however, the preference of six participants was particularly directed towards the employment of more than one pre-writing strategy such as that adopting brainstorming and graphic organisers ($a+f= 4.55\%$), freewriting and questioning ($b+c= 4.55\%$), questioning and researching ($c+e= 4.55\%$).

Table 4.12

The Use of Pre-writing Strategies

Option	Number	Percentage
a) Yes	22	70.97%
b) No	9	29.03%
Total	31	100%

Figure 4.12

The Use of Pre-writing Strategies

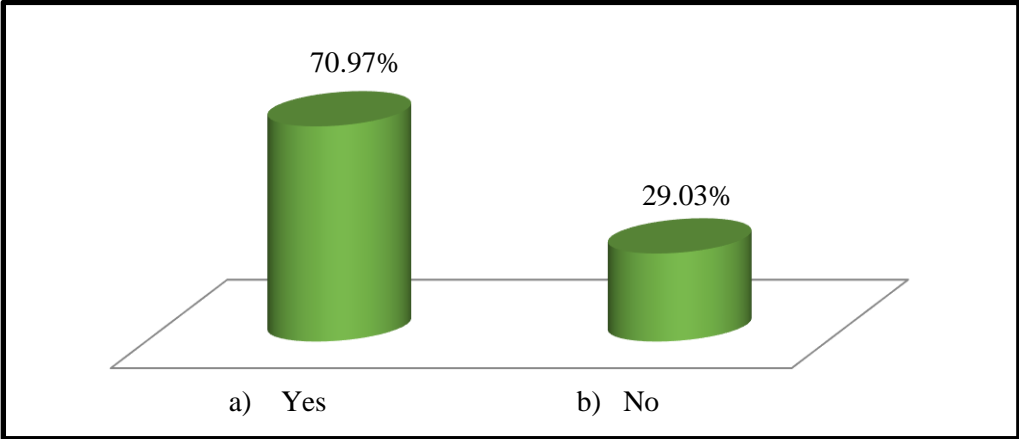
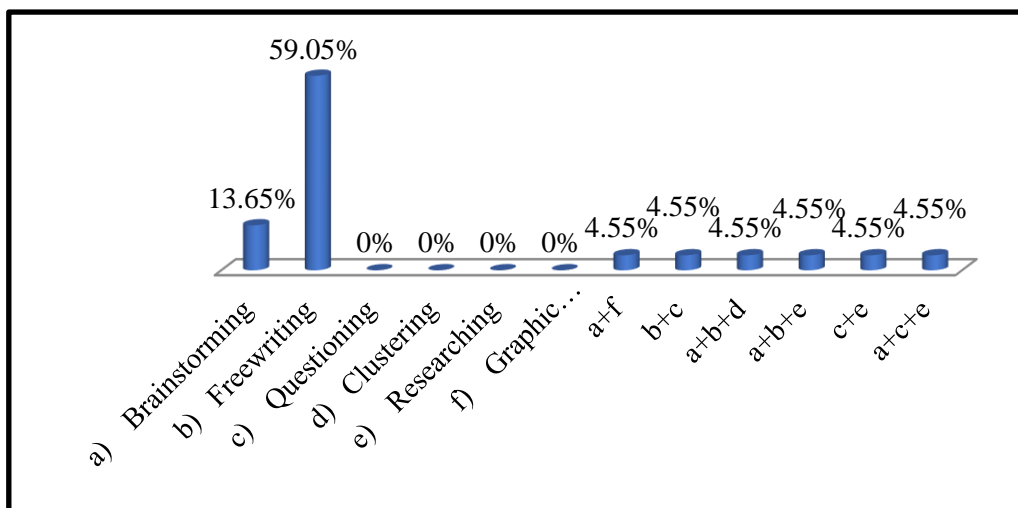


Table 4.13*Specification of Pre-writing Strategies*

Option	Number	Percentage
a) Brainstorming	3	13.65%
b) Freewriting	13	59.05%
c) Questioning	0	0%
d) Clustering	0	0%
e) Researching	0	0%
f) Graphic organisers	0	0%
a+f	1	4.55%
b+c	1	4.55%
a+b+d	1	4.55%
a+b+e	1	4.55%
c+e	1	4.55%
a+c+e	1	4.55%
Total	22	100%

Figure 4.13*Specification of Pre-writing Strategies*

Section Three: Concept Mapping

The primary objective of this section is not only to gauge students' familiarity and understanding of the targeted strategy, concept mapping, but also to ascertain whether they actively integrate it into their writing tasks or academic subjects. For this purpose, three item questions were elaborated, answered, and analysed. A brief overview of the responses to the query were statistically outlined in tables and illustrated in figures.

Item 11. Are you familiar with the strategy of concept mapping?

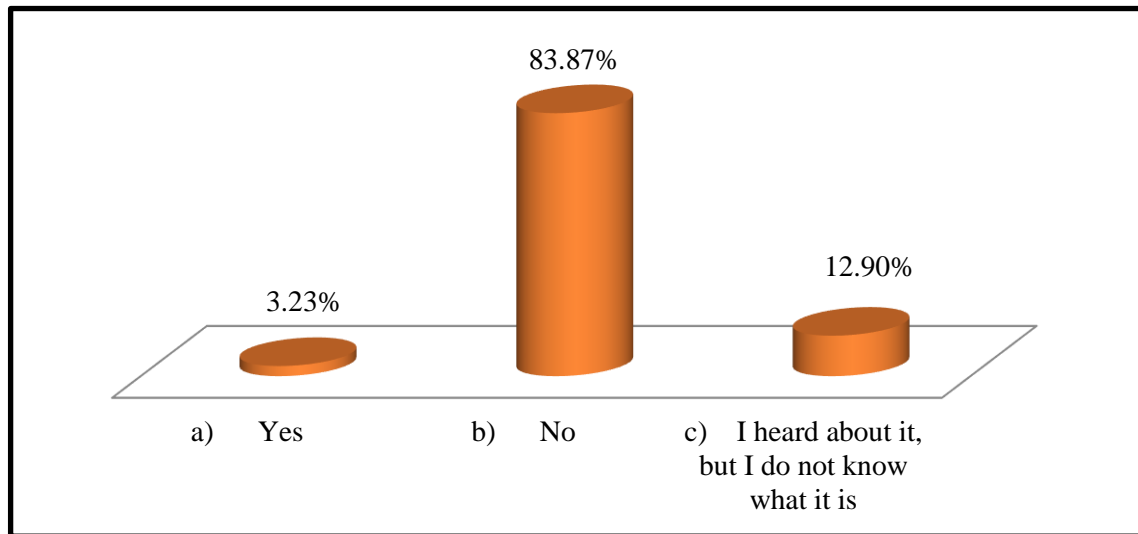
In case you are familiar with it, in simple words, please indicate what it is.

As noted in Table 4.14 and Figure 4.14, the current item, which examines students' acquaintance with concept mapping, provides three possible options to pick from.

Table 4.14

Students' Familiarity with Concept Mapping

Option	Number	Percentage
a) Yes	1	3.23%
b) No	26	83.87%
c) I heard about it, but I do not know what it is	4	12.90%
Total	31	100%

Figure 4.14*Students' Familiarity with Concept Mapping*

Based on the distribution of responses, it is apparent that only one student opted for 'yes' (3.23%). In the attempt to elucidate his/her understanding of the strategy, s/he articulates, "Mapping is a helpful strategy to indicate the theme to help you indicate the most important ideas before you start writing." While his/her statement regarding the efficacy of concept mapping in determining central themes and ideas is accurate, his/her definition overlooks several overriding details. An illustration of these particularities is the characterisation of concept mapping by nodes, links, and linking expressions.

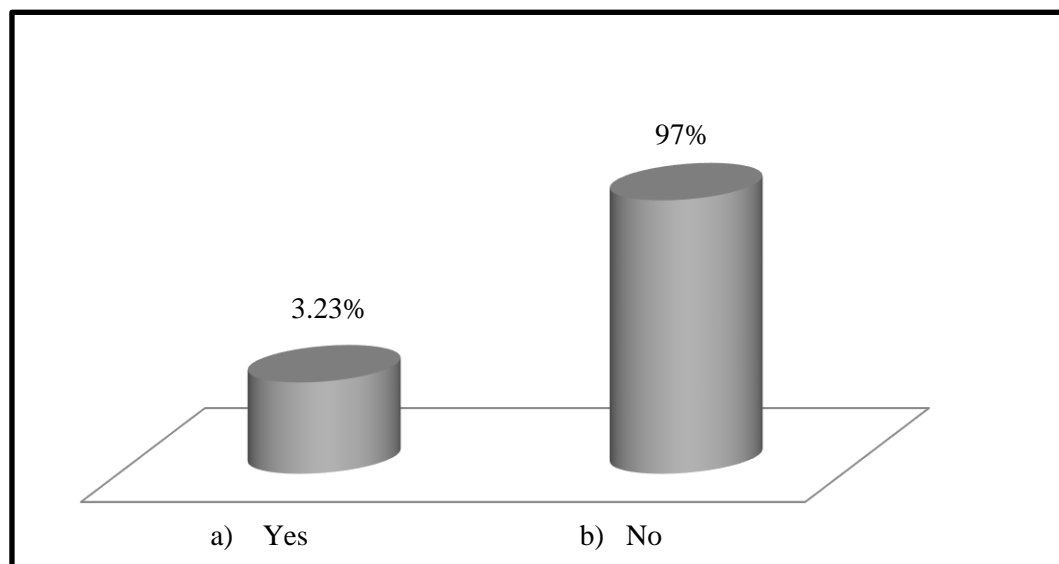
It is also noticeable that four students indicate, 'I heard about it, but I do not know what it is' (12.90%). Of particular note is the total number of 26 participants (83.87%) who selected 'no', implying that they are not knowledgeable about the concept mapping strategy. Bearing this in mind, and for a more effective and comprehensive introduction to the targeted strategy, the researcher may better engage in providing a detailed and thorough account, emphasising the specificities, characteristics, and implications of the studied strategy.

Item 12. Do you use concept mapping during the pre-writing stage?**Whatever your answer would be, please justify**

The findings of the current item align with those of the preceding question, communicating the discrepancy in the employment of concept mapping during the pre-writing stage. Precisely, Table 4.15 and Figure 4.15 reinforce the observation that only one respondent (3.23%) uses concept mapping while all other students (97%) do not.

Table 4.15*Use of Concept Mapping in Pre-writing*

Option	Number	Percentage
a) Yes	1	3.23%
b) No	30	97%
Total	31	100%

Figure 4.15*Use of Concept Mapping in Pre-writing*

The current item also strives to present some sample answers provided as justification for students' choices. Some are as follows:

For the student who chooses “Yes”

The student states, “I like to identify the topic and then the ideas related with this topic in a form of mapping. So that while writing, I can remember the topic, important ideas, examples and I mention them all in my paragraph or essay”.

For those who select “No”

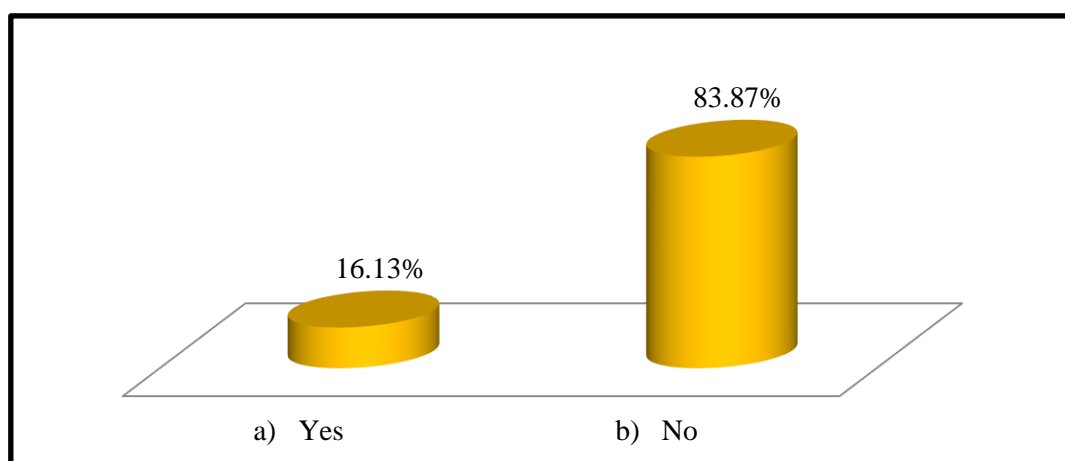
Student A explains, “*I don't know how to use mapping and I just write my ideas in the draft. That's all.*”

- B. “*Because I do not know how to use it.*”
- C. “*Because I don't have information about it.*”
- D. “*I have no idea about how to apply it while pre-writing.*”
- E. “*I didn't hear about it before; that's why.*”
- F. “*I don't use mapping during my pre-writing stage because I had no previous idea about it.*”
- G. “*I do not know it.*”

A close examination of students' justifications unveils that the student's utilisation of concept mapping as a pre-writing strategy stems from his/her perception of it as an effective means for delineating the major topic and subsidiary ideas. S/he also views its usefulness in retaining information, facilitating its recall and integration when writing paragraphs. Almost all students' answers indicate that their non-utilisation of concept mapping derives from a lack of hands-on experience with the technique. Showing non-familiarity with its principles and methodologies simply implies an absence of exposure to it by means of structured learning or reading, which may potentially introduce insights into multiple learning strategies.

Item 13. Does any of your instructors use concept mapping in his or her classroom?**If yes, in which module(s) does s/he use it?****Table 4.16***Use of Concept Mapping by Instructors*

Option	Number	Perecentage
a) Yes	5	16.13%
b) No	26	83.87%
Total	31	100%

Figure 4.16*Use of Concept Mapping by Instructors*

The present query aspires to examine the integration of the concept mapping strategy into teachers' teaching methodologies, and, if so, to particularise the subjects they employ it within. The answers to the question, which is featured in Table 4.16 and Figure 4.16, elucidate that the majority of students opted for 'no' (26 =83.87%), clarifying that their teachers do not employ concept mapping in their classrooms. Nonetheless, a small portion of students selected 'yes' (5 =16.13%), establishing that their instructors incorporate this strategy in a myriad of subjects, such as literature, civilisation, and linguistics. It's worth noting that such subjects

encompass lessons yielding several details and facts, which is why the use of strategies that can visually display information can be remarkably useful. Concept mapping can be a versatile tool, enabling learners to summarise, organise, and present these details in a more flexible manner and to manifest the relationships between them.

Item 14. Concept mapping is considered one of the most powerful educational tools to improve writing ability. How excited are you to have the opportunity to use this strategy during the present?

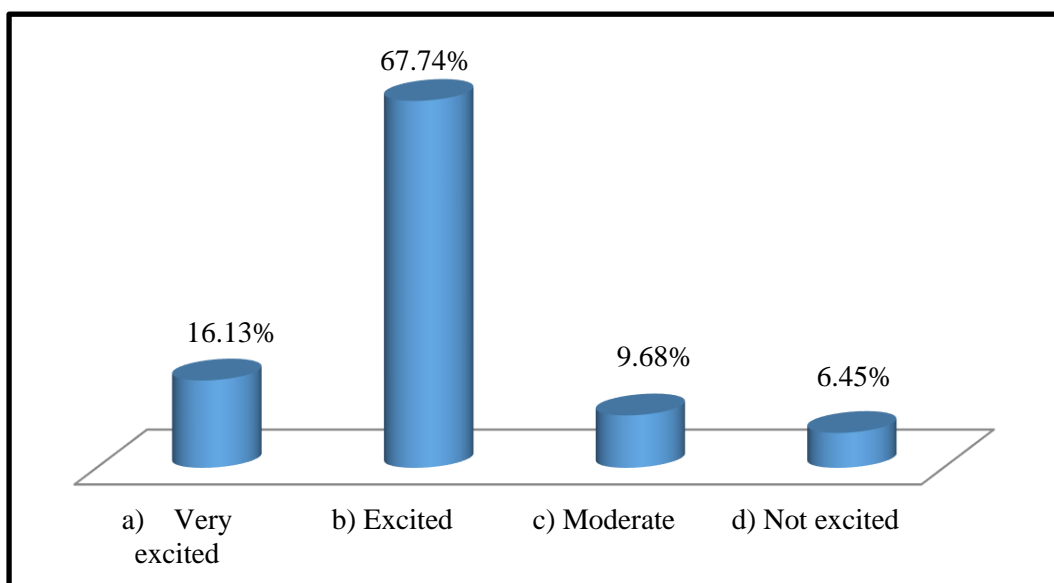
Table 4.17

Excitement about the Participation in the Research Study

Option	Number	Percentage
a) Very excited	5	16.13%
b) Excited	21	67.74%
c) Moderate	3	9.68%
d) Not excited	2	6.45%
Total	31	100%

Figure 4.17

Excitement about the Participation in the Research Study



The last item in the questionnaire is simply geared towards exploring students' excitement and motivation with regard to their participation in the study sessions. With the expectation that all the students would display interest in examining and learning about the studied strategy, the evidence points to varied levels of enthusiasm among participants. Specifically, and as presented in Table 4.17 and Figure 4.17, two students selected (6.45%) 'not excited', three (9.68%) chose 'moderate', 21 (67.74%) expressed they were 'excited', and five (16.13%) indicated being 'very excited'. Fundamentally, the majority of participants exhibit enthusiasm and curiosity towards understanding the concept mapping strategy, revealing an inclination toward its constituent parts and intricacies.

4.2 Analysis of Teachers' Questionnaire

Section One: General Information,

This section, which embraces four items, is particularly designed to gain a comprehensive understanding of the diversity within the targeted sample of teachers. Identifying their beliefs, features, perspectives, background, experiences, and disparities can be established by seeking demographic data and addressing factors such as gender, education level, instructional period at the university, and length of university writing instruction. In this regard, a summary of the responses to the inquiry is featured in Tables 4.18, 4.19, 4.20, and 4.21, as well as Figures 4.18, 4.19, 4.20, and 4.21. Evidently, the anonymous sample consists of five male teachers (50%) and five female teachers (50%), manifesting an equal distribution of gender.

Besides, the 10 teachers have completed advanced academic qualifications and earned varied college degree levels, with seven holding a doctorate degree (70%), three (30%) completing a magister degree, and none (0%) holding the rank of professor. Overall, it is often established that teachers' years of service at the university may deliver relevant and meaningful information about their instructional quality and level of experience. Majorly, Table 4.20

communicates the idea that the duration spent teaching as a university lecturer differs among the instructors participating in the research study, with some having taught for five years while others for six, seven, eight, 12, 15, and 17 years. In the same context, Table 4.21 expresses that there is variability with regard to the time spent teaching writing at the university, ranging from a period of four years to 12 years. Teaching writing for an extended period better enables the teacher to decide about the more suitable ways to engage students in more successful and effective writing experiences, offering clarity on their writing skills, course content, and support.

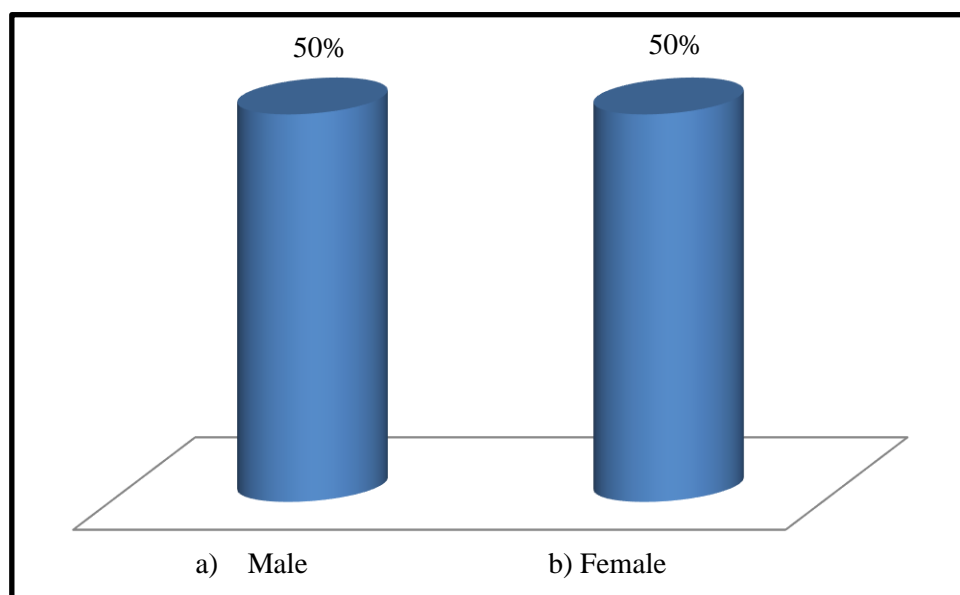
Table 4.18

Teachers' Gender Distribution

Option	Number	Percentage
a) Male	5	50%
b) Female	5	50%
Total	10	100%

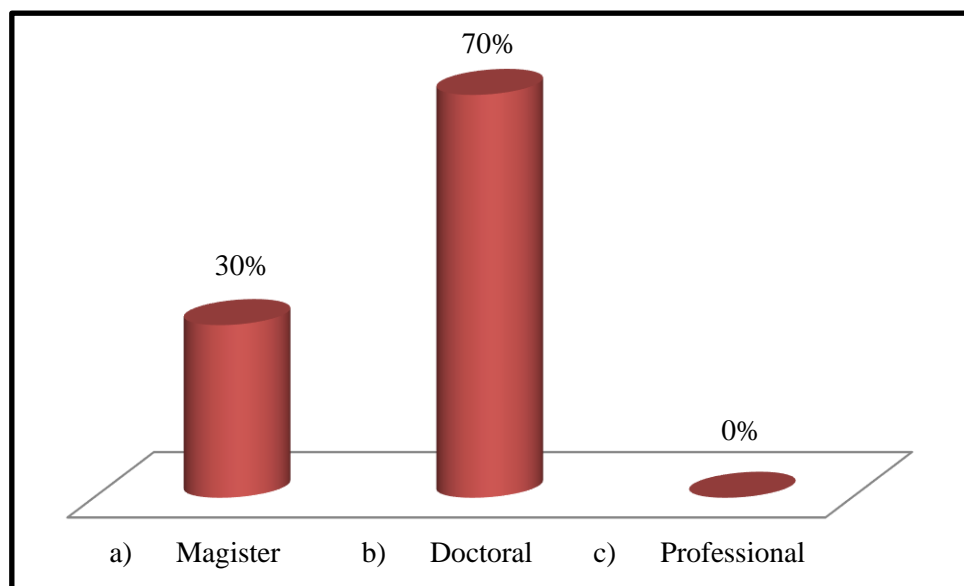
Figure 4.18

Teachers' Gender Distribution



Item 2. Would you specify your degree:**Table 4.19***Teachers' Degree*

Option	Number	Percentage
a) Magister	3	30%
b) Doctoral	7	70%
c) Professional	0	0%
Total	10	100%

Figure 4.19*Teachers' Degree*

Item 3. How long have you been teaching English at the university?**Table 4.20***Period of Teaching English at the University*

Teacher	Span (years)
Teacher 1	17
Teacher 2	7
Teacher 3	13
Teacher 4	5
Teacher 5	12
Teacher 6	6
Teacher 7	12
Teacher 8	6
Teacher 9	8
Teacher 10	15

Item 4. How long have you been teaching writing at the university?**Table 4.21***Period of Teaching Writing at the University*

Teacher	Duration (years)
Teacher 1	11
Teacher 2	5
Teacher 3	12
Teacher 4	4
Teacher 5	8
Teacher 6	6
Teacher 7	12
Teacher 8	4
Teacher 9	8
Teacher 10	7

Section Two: Teachers' Practice in the Written Expression Course

Item 5. How do you find teaching writing?

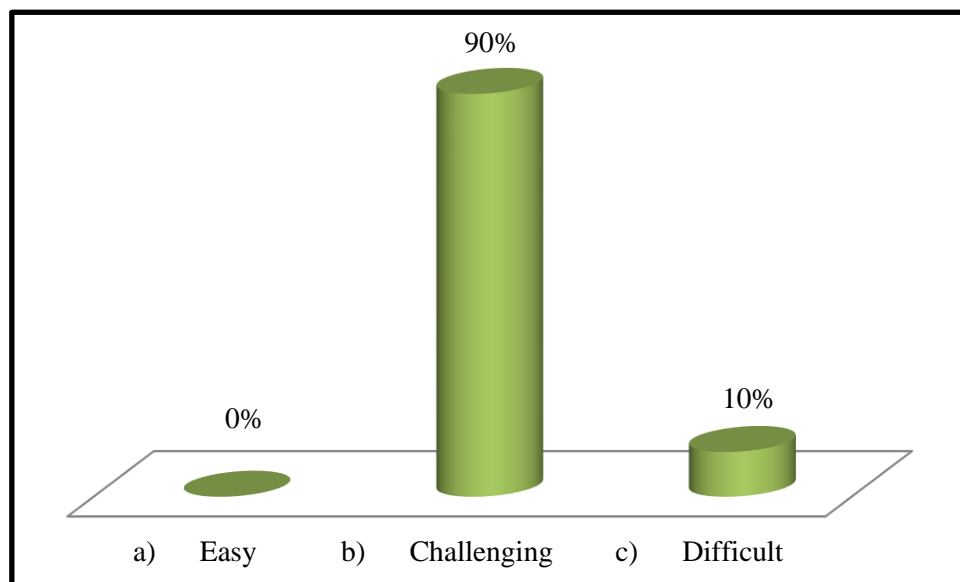
Whatever your answer would be, please justify

The current three-option multiple-choice item inquires about the way teachers perceive writing instruction, ultimately benefiting from their viewpoints. Asking teachers about their experiences regarding teaching writing is critical for gaining meaningful feedback and better knowledge about the practical obstacles they confront in their classrooms. Their perspectives also illuminate the numerous inherent challenges and difficulties that student writers often face, thereby providing targeted support and instruction. By reason of its various interconnected processes and skills, writing engenders a myriad of challenges for many students and teachers. For precisely this reason, and according to Table 4.22 and Figure 4.20, the majority of respondents (9, representing 90%) opted for "challenging", with just one (10%) opting for "difficult". None of them (0%) selected "easy".

To clarify, and to support their claims, the respondents pointed to a number of factors that may potentially make teaching writing even more demanding, spanning from students' lack of awareness, motivation, and engagement to the prevalence of differentiated proficiency levels among them. The quest to select the most effective writing approach that best meets students' expectations, along with limited time and practice, constitute additional notable factors contributing to the difficulties in teaching writing. Given these intricacies, proficient writing instruction necessitates tackling each facet precisely and comprehensively.

Table 4.22*Way Teachers Consider Teaching Writing*

Option	Number	Percentage
a) Easy	0	0%
b) Challenging	9	90%
c) Difficult	1	10%
Total	10	100%

Figure 4.20*Way Teachers Consider Teaching Writing*

Item 6. Based on your experience, how do you evaluate the English writing proficiency level of the majority of third year students of English at Biskra University?

Although there is no a single level of English writing proficiency among students, the majority of EFL students, within the same academic year, have typically developed approximate language abilities and skills. As part of the current questionnaire, teachers were asked to mark their responses by ticking one of the boxes that best matches and represents the English writing proficiency level of third year students of English at Biskra University. As

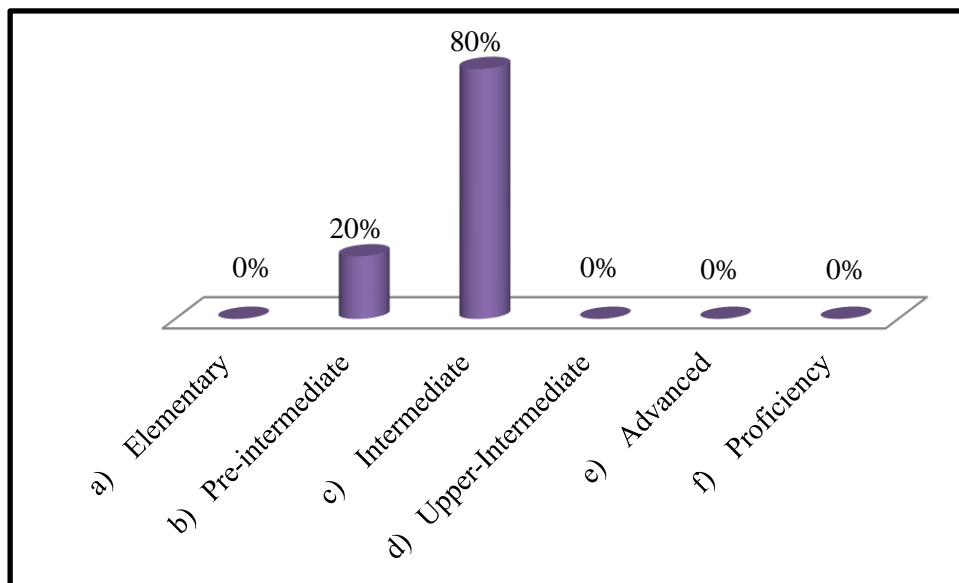
illustrated in Table 4.23 and Figure 4.21, the possible options provided were elementary, pre-intermediate, intermediate, upper-intermediate, advanced, and proficiency.

Correspondingly, the great majority of participants (eight representing 80%) selected 'intermediate' while 20%, originally representing two teachers, opted for pre-intermediate'. None of the remaining options was chosen. Pinpointing students' English writing proficiency level is particularly important, for it helps the researcher to tailor instruction, allowing for the effective design of content and methodical planning of the activities related to individual intervention sessions. This can also act as a guiding principle for the researcher to decide about the appropriate instructional materials, texts, exercises, and assignments that best align with students' potentials and state of knowledge.

Table 4.23

English Writing Proficiency Level

Option	Number	Percentage
a) Elementary	0	0%
b) Pre-intermediate	2	20%
c) Intermediate	8	80%
d) Upper-Intermediate	0	0%
e) Advanced	0	0%
f) Proficiency	0	0%
Total	10	100%

Figure 4.21*English Writing Proficiency Level*

Item 7. Do your students encounter any difficulties while engaged in the writing task?

The current item is purposefully reiterated and included in the teachers' questionnaire to solicit teachers' thoughts regarding students' possible writing difficulties, with the aim of elucidating and understanding their precise nature. As portrayed in Table 4.24, none of the teachers picked 'no'; instead, all (100%) went for 'yes' to confirm that their students suffer from the complexities of the writing skill and regularly experience challenges when composing passages. Instances of these obstacles are succinctly encapsulated in Table 4.25 and Figure 4.23.

Not only does the table illustrate the compilation of responses to the inquiry, but it also outlines the defined list of the provided possibilities for selection, namely difficulty with capitalisation, punctuation, layout, and spelling (option a), difficulty with word choice (option b), difficulty with sentence structure and word order (option c), difficulty organising and connecting ideas in a logical sequence (option d), lack of ideas about the writing topic or theme

(option e), and difficulty with prior knowledge activation (option f). Observably, all the respondents did not seek single-select answers. Nevertheless, they supplied multi-select responses by marking several answers. Examples of these answer choices are a+c+d (designated by two respondents 20%), b+d (by one respondent 10%), b+c+e (by one respondent 10%), d+f (by one respondent 10%), and a+b+c+d+e+f (by five respondents 50%). In its most basic form, students' writing difficulties are manifested in basic limitations in grammar usage, sentence structure, punctuation, and vocabulary, along with significant issues of word choice, idea shortage and organization, and prior knowledge activation.

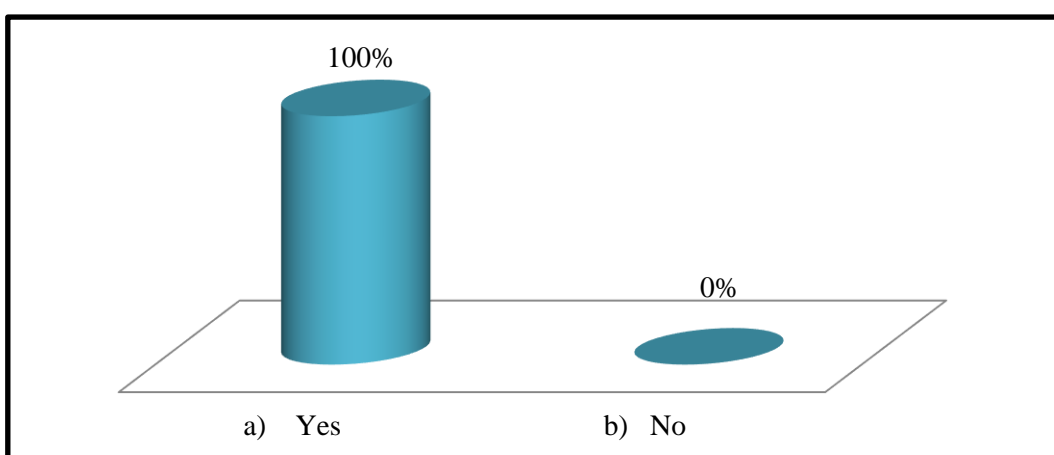
Table 4.24

Students' Writing Difficulties

Option	Number	Percentage
a) Yes	10	100%
b) No	0	0%
Total	10	100%

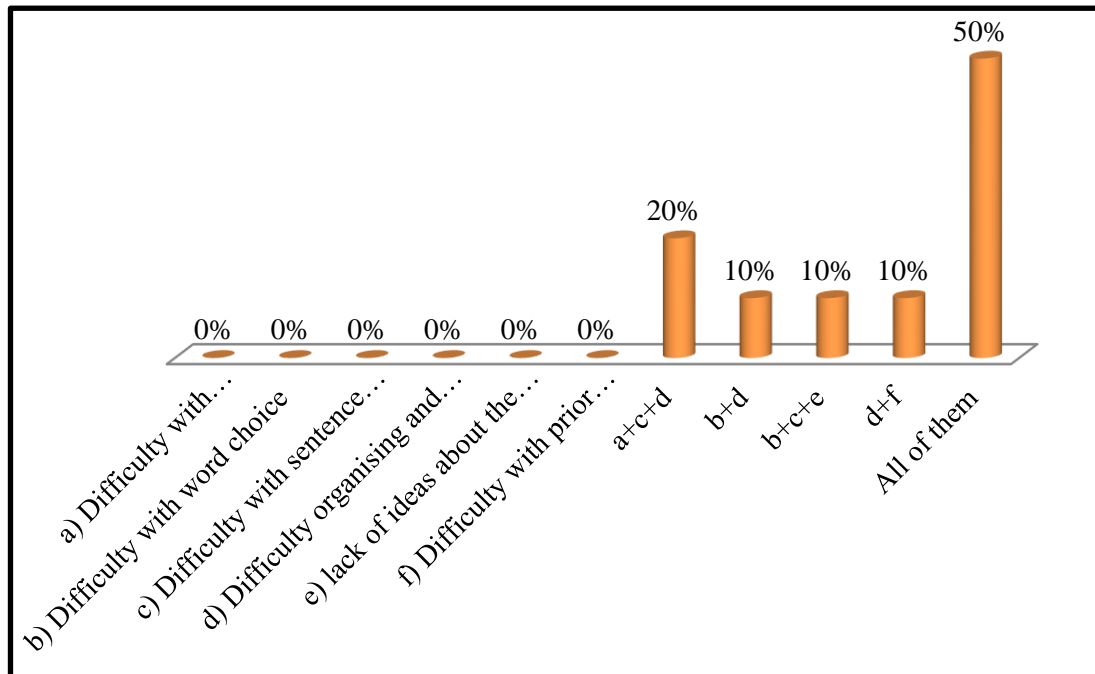
Figure 4.22

Students' Writing Difficulties



If yes, what do you think the major difficulties are?**Others****Table 4.25***Identification of Students' Writing Difficulties*

Option	Number	Percentage
a) Difficulty with capitalisation, punctuation, layout, and spelling	0	0%
b) Difficulty with word choice	0	0%
c) Difficulty with sentence structure and word order	0	0%
d) Difficulty organising and connecting ideas in logical sequence	0	0%
e) lack of ideas about the writing topic or theme	0	0%
f) Difficulty with prior knowledge activation	0	0%
g) a+c+d	2	20%
h) b+d	1	10%
i) b+c+e	1	10%
g) d+f	1	10%
l) All of them	5	50%
Total	10	100%

Figure 4.23*Identification of Students' Writing Difficulties*

Item 8. The main reasons for students' writing difficulties can be attributed to:
(You may choose more than one answer).

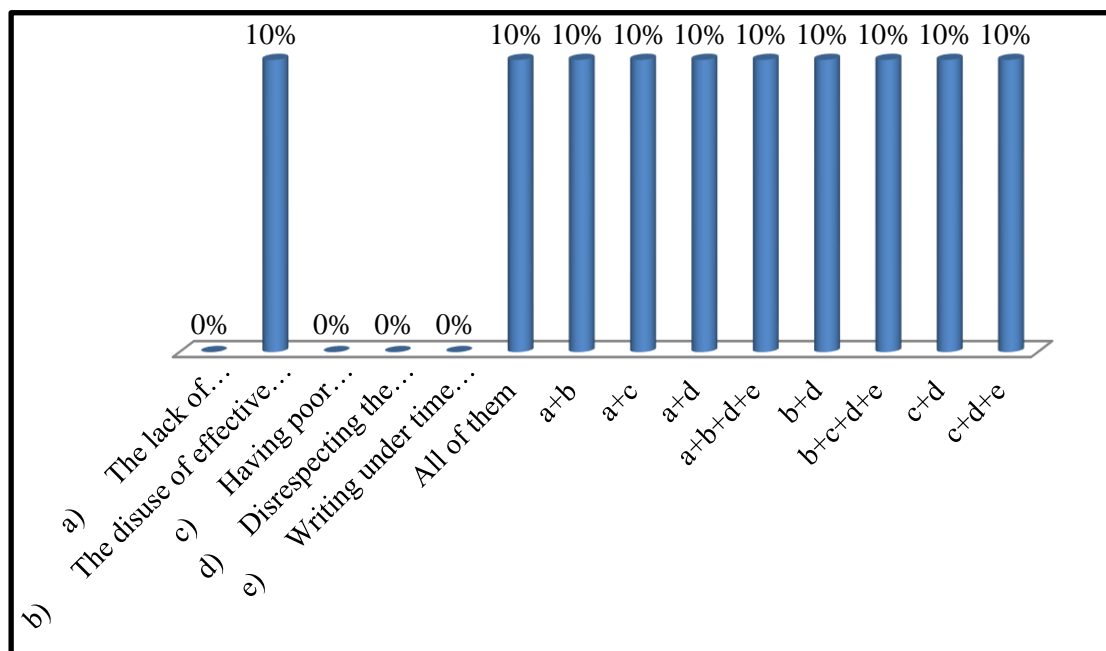
Others

Recognising the factors that Bring about and play a part in the most common writing challenges is essential to better understand the writing struggles, thereby providing adequate targeted interventions and support. This clarifies the purpose of the present item, the results of which are summarised and showcased within Table 4.26 and Figure 4.24. Upon closer examination, a significant issue becomes apparent. Writing challenges, which are remarkably diverse, can be ascribed to a multitude of interrelated influences operating in shaping writing skills and capacities. The data exhibits that these factors can vary widely from person to person, with each option chosen at least once by the participants.

Apparently, the most typical causes that may bring about obstacles in writing include: the lack of opportunities for practicing writing (chosen 5 times), the disuse of effective writing strategies (chosen 6 times), having poor background knowledge (chosen 5 times), disrespecting the writing stages (chosen 7 times), and writing under time constraints (chosen 4 times). The greater part of teachers opted for multiple choices, ranging from two to four selections. To exemplify, one teacher (10%) selected the combination (a+b) while another (10%) picked (b+c+d+e). Other teachers believe that writing hurdles can also arise from other unmentioned factors, adding the lack of language competence and reading opportunities to their responses.

Table 4.26*Reasons of Students' Writing Difficulties*

Option	Number	Percentage
a) The lack of opportunities for practicing writing	0	0%
b) The disuse of effective writing strategies	1	10%
c) Having poor background knowledge	0	0%
d) Disrespecting the writing stages	0	0%
e) Writing under time constraints	0	0%
All of them	1	10%
a+b	1	10%
a+c	1	10%
a+d	1	10%
a+b+d+e	1	10%
b+d	1	10%
b+c+d+e	1	10%
c+d	1	10%
c+d+e	1	10%
Total	10	100%

Figure 4.24*Reasons of Students' Writing Difficulties*

Item 9. What kind of support do you usually give to learners who are low achievers in terms of writing?

Recognising how teachers might support struggling writers provides insights into the way students' weaknesses in writing are commonly addressed. Chiefly, this knowledge might notably help delineate teachers' instructional methodologies, assessment practices, and timely assistance. Teachers' responses to the inquiry are briefly outlined below:

Teacher 1 says, "To help weak writers, I seek practice and, of course, teacher feedback, which cannot be neglected".

Teacher 2 says, "My effort revolves around guided practice and individual feedback."

Teacher 3 states, "I usually advise them to have more practice. Feedback is essential to correct mistakes and do better."

Teacher 4 mentions, “I advise them to write regularly. I will correct them as soon as they finish”.

Teacher 5 comments, “To improve writing skills and reduce difficulties, I suggest more tasks and feedback:”

Teacher 6 asserts, “I always insist on my students to always write. Then, I read and correct the work”.

Teacher 7 expresses, “I insist on planning and organising ideas. I always advise my students to follow the steps of writing according to their logical sequence”.

Teacher 8 articulates, “I always encourage low achievers to begin with brainstorming and steadily continue with the rest of the stages”.

Teacher 9 says, “I give them a model of a paragraph or an essay to imitate in terms of form, structure, and organisation of ideas, etc”.

Teacher 10 indicates, “...I would stress the availability of the teacher all the time to assess students’ writing production, as well as to encourage them, praise them, and boost their confidence”.

In their endeavour to explain their role in supporting low achievers in terms of writing, teacher participants elaborated on the significance of teacher feedback (cited by six teachers), writing practice (indicated by six teachers), model texts (cited by one teacher), introducing writing stages (cited by two teachers), and moral support (mentioned by one teacher). It is important to note that providing feedback and the necessary moral support encourage students to strive to revise their production to meet the fundamentals and standards of good writing. This can be established by improving the quality of employed ideas, as well as the language used to express thoughts.

Exposing students, especially the low achievers in terms of writing, to such supportive actions as constant writing practice and convenient model texts enables them to gain an improved knowledge of writing basics and principles, thereby enhancing essential writing skills. The written communication can also be promoted when the student operates according to a structured framework of the well-defined stages of pre-writing drafting, revising, and editing.

Item 10. Do you consider the pre-writing stage important in producing effective written text?

The present item aspires to discern not only teachers' opinions on the importance of the pre-writing stage in producing effective written texts but also their efforts in teaching certain pre-writing strategies, including any specific techniques they may introduce. A synopsis of the replies is organised into two items (11, 12), manifested in Tables 4.27 and 4.28, respectively. The results are also depicted in Figures 4.25 and 4.26. In this sense, a total of ten teachers (100%) distinctly opted for 'yes,' emphasising the value of the pre-writing stage, or simply initial planning, in building compelling and well-crafted written material. Clearly, and in accordance with Table 4.27, this offers an explanation for their dedication to familiarise and instruct students on specific writing strategies to be employed during the pre-writing stage.

Upon closer inspection of Table 4.29 and Figure 4.27, it becomes evident that the teachers present and expose their students to an assortment of strategies, giving them the freedom to seek out what works best for them. Instances of these strategies are brainstorming, freewriting, questioning, clustering, and researching. Some instructors appear to stick to a single strategy, such as brainstorming (selected by one participant) while others introduce a spectrum of strategies ranging from two (such as a+c indicated by one participant) to five (a+b+c+d+e pointed out by one participant). Apart from the option strategies originally listed in the multiple-choice question, it is worth considering the use of additional pre-writing

strategies like listing and mind mapping, which were principally added by one of the participants, who highlighted their positive effect on the quality of writing.

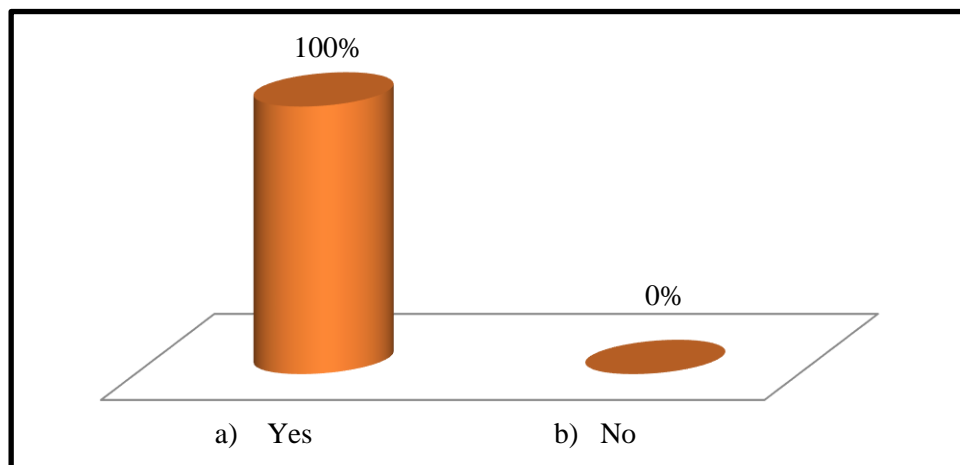
Table 4.27

Teachers' Opinions on the Importance of the Pre-writing Stage

Option	Number	Percentage
a) Yes	10	100%
m)No	0	0%
Total	10	100%

Figure 4.25

Teachers' Opinions on the Importance of the Pre-writing Stage



Item 11. Do you usually introduce your students to certain strategies to be employed during the pre-writing stage?

Table 4.28*Teachers' Introduction of Pre-writing Strategies*

Option	Number	Percentage
a) Yes	10	10%
b) No	0	0%
Total	10	100%

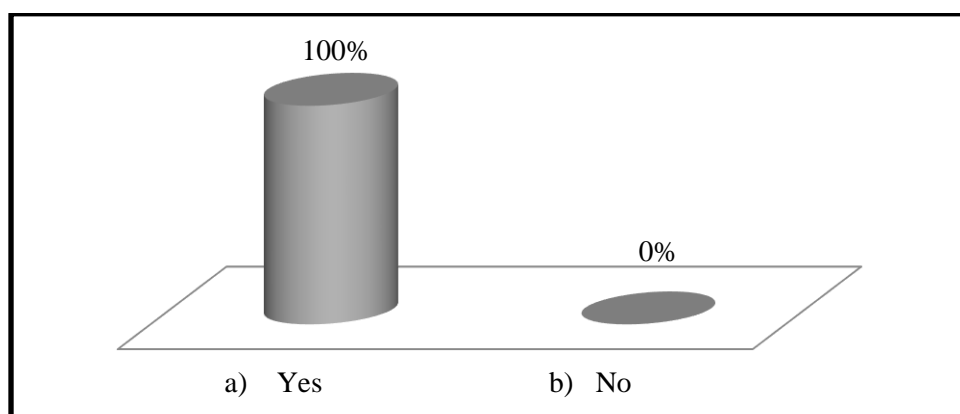
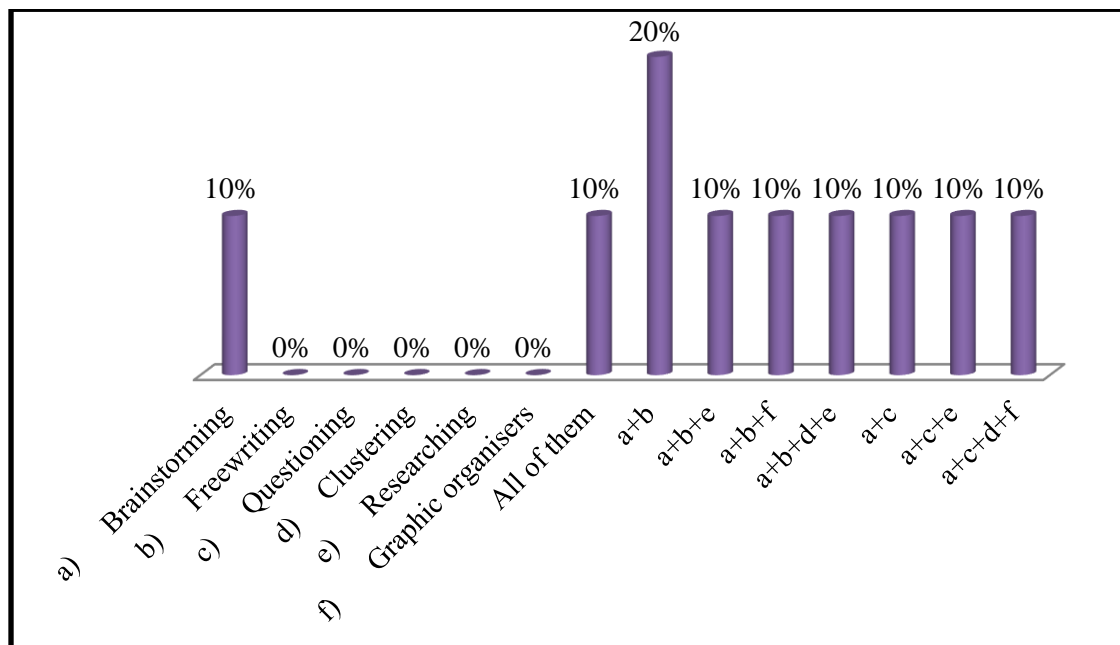
Figure 4.26*Teachers' Introduction of Pre-writing Strategies***If yes, what kind of strategies?**

Table 4.29*Teachers' Use of Pre-writing Strategies*

Option	Number	Percentage
a) Brainstorming	1	10%
b) Freewriting	0	0%
c) Questioning	0	0%
d) Clustering	0	0%
e) Researching	0	0%
f) All of them	1	10%
a+b	2	20%
a+b+e	1	10%
a+b	1	10%
a+b+d+e	1	10%
a+c	1	10%
a+c+e	1	10%
a+c+d	1	10%
Total	10	100%

Figure 4.27*Teachers' Use of Pre-writing Strategies***Section Three: Concept Mapping**

Item 12. During the pre-writing stage, do you encourage them to use graphic organisers?

If yes, please indicate which type of graphic organisers you usually introduce.

This section is precisely geared towards gauging teacher participants' familiarity with and use of the concept mapping pre-writing strategy. Since concept mapping is among the diverse types of graphic organisers, the three items included in the present section give context to the employment of graphic organisers and concept mapping in the planning stage, as well as to the teachers' view with regard to the implementation of concept mapping as a pre-writing strategy in the improvement of learners' writing performance.

An overview of assorted replies to items 13 and 14 is portrayed in Tables 4.30 and 4.31, along with the corresponding Figures 4.28 and 4.29, respectively. The statistical analysis reveals an equal and balanced distribution of answers, with five teachers (50%) fundamentally choosing “yes” and five (50%) “opting for “no ”. Delving into the details of Table 4.30, it is worth noting that only five teachers actively instigate students to apply graphic organisers, as varied as mind mapping, listing tables, concept mapping, tree chart, and idea wheel, in the stage of pre-writing. A discernible point emerged as we examined their justifications. Notably, concept mapping emerged and was cited as one of the responses provided by the participants, indicating that some teachers are informed about the studied strategy.

To gain further insights into the matter, Table 4.31 is closely inspected. The data reflects variations in answers, with a total of seven respondents (70%) picking “no”. This means that the preponderance of teachers does not promote the application of concept mapping in student writing, in general, or in the pre-writing stage, in particular. To better understand the reasoning behind their choices, a separate section was designated for justification. Some of the teachers’ answers are as follows:

Teacher 1 states, *“I don’t teach it to the students because I do not know about it. However, I use clustering and mind mapping”*.

Teacher 2 reveals, *“They do not have to employ it, as they usually deal with topics ranging from daily life activities to express their feelings in a given situation”*.

Teacher 3 indicates, *“I have never heard about it”*.

Teacher 4 reports, *“I know many techniques, but not this one”*.

Briefly stated, there are two principal reasons for not recommending and encouraging the employment of concept mapping in the planning stage. The first stems from a lack of familiarisation and prior experience with the strategy while the second reflects some teachers' opinion that common and everyday life writing topics do not warrant the application of such a visual tool as the concept map.

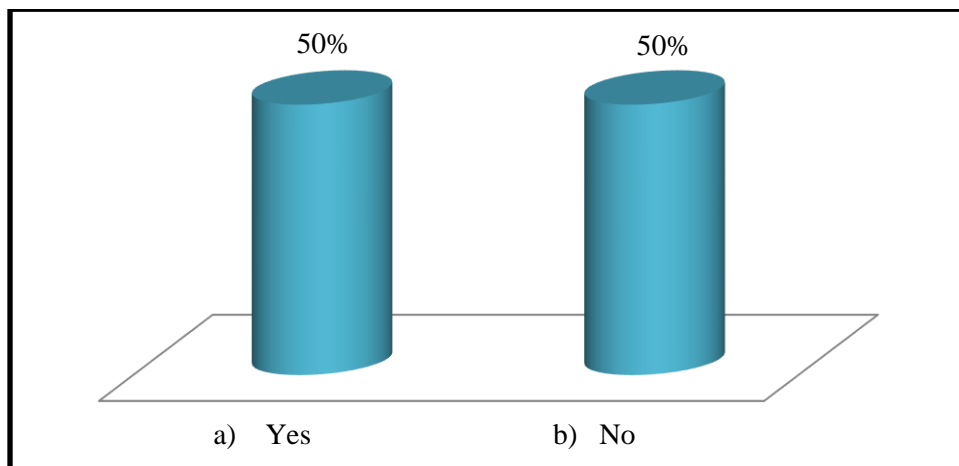
Table 4.30

Teachers' Encouragement for the Use of Graphic Organisers

Option	Number	Percentage
a) Yes	5	50%
b) No	5	50%
Total	10	100%

Figure 4.28

Teachers' Encouragement for the Use of Graphic Organisers



Item 13. Do you specifically encourage them to employ the concept mapping pre-writing strategy?

If you select 'no', please justify

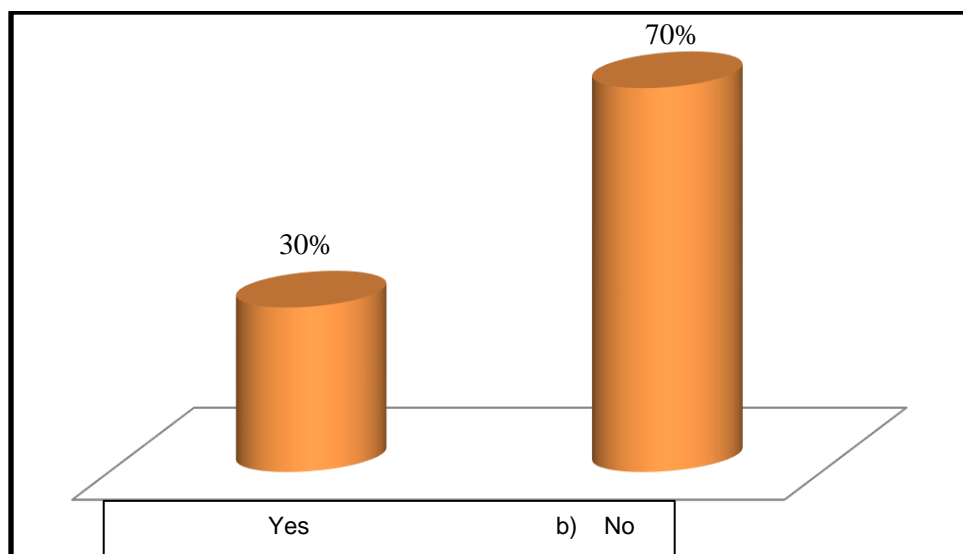
Table 4.31

Teachers' Encouragement for the Use of Concept Mapping

Option	Number	Percentage
a) Yes	3	30%
b) No	7	70%
Total	10	100%

Figure 4.29

Teachers' Encouragement for the Use of Concept Mapping



Item 14. Concept mapping is considered one of the most powerful educational tools to enhance learning. What do you think about its implementation as a pre-writing strategy to improve learners' writing performance?

If you would like to add any comments or suggestions, please feel free.

The final item of the questionnaire strives to determine teachers' thoughts and perspectives on incorporating the concept mapping pre-writing strategy to improve learners' writing performance. A compilation of some of their responses to the inquiry is outlined below:

Teacher 1 notes, *"I literally agree it deserves much more attention and it should be reconsidered in writing teaching. I noticed that most writing instructors give much interest to writing products, neglecting the pre-writing activities"*.

Teacher 2, *"Yes, I can just confirm that concept mapping is an excellent way to be incorporated. I highly recommend it"*.

Teacher 3, *"This tool is efficient and practical in gathering ideas, connecting them, and identifying key points"*.

Teachers 4, *"This technique can open the horizon to so many opportunities to improve their writing"*.

Teacher 5, *"Teachers have to incorporate this strategy to guarantee learners' writing improvement"*.

Teacher 6, *"It may be beneficial for students as it has been proven to enhance their writing difficulties"*.

Teacher 7, *"I totally encourage both teachers and students to think of incorporating it into their pre-writing stage. A well-written piece is the one that is thought of and well-mapped"*.

In view of this, and after thoroughly reviewing their answers, the teacher participants' replies express interest and concern about the concept mapping strategy, along with its attributes and applications. More specifically, the respondents also show that they consider concept mapping to be a valuable tool for improving writing skills, establishing its role in generating ideas, identifying key points, organising content, and structuring texts. Apparently, they demonstrate enthusiasm for applying it to crafting and producing a coherent, logical, and impactful written production, thereby adopting it for future writing tasks and projects.

4.3 Analysis of Tests

The present section reports and showcases the quantitative analysis of numerical and quantifiable data, involving both descriptive and inferential types of statistics. It precisely documents the detailed results that serve to draw conclusions and answer the third research question, questing to examine the impact of the concept mapping pre-writing strategy on EFL students' writing performance. This is particularly in terms of content, organisation, and mechanics. To better convey complex data and to well-present the findings, illustrative displays such as tables and graphs are also displayed. In this connection, Tables 4.32, 4.33, 4.34, 4.35, and 436 furnish fundamental information about the participants' performances in the two treatment stages, with particular attention given to the accurate and proper assignment of participants to their respective scores. Some of the key patterns depicted and outlined within the tables are the pretest and posttest scores assigned by both raters for content, organisation, and mechanics, average values for content, organisation, and mechanics in the pretest and posttest, and the final pretest and posttest scores.

Table 4.32*Pretest Scores According to Both Raters*

Students	Rater 1			Rater 2		
	Content	Organisation	Mechanics	Content	Organisation	Mechanics
Pretest Writing Aspects						
Stud 1	2	2	2	1.5	2	1.5
Stud 2	1.5	2.5	4	2.5	4	3.5
Stud 3	2	1	3	4	1.5	3
Stud 4	6	1.5	3	4	1	4
Stud 5	4	2	3	2	4	3
Stud 6	1.5	2.5	3	3	3	3.5
Stud 7	2.5	2	1	4	2.5	1.5
Stud 8	2	1	1.5	4	1.5	2
Stud 9	2.5	6	3	4	4.5	2.5
Stud 10	2.5	1.5	2	2	1	1.5
Stud 11	4.5	2	1	5	3	2
Stud 12	4.5	3	2	5.5	4.5	2.5
Stud 13	5	2.5	1.5	4	3.5	1
Stud 14	2.5	3	2	3	2.5	2.5
Stud 15	2.5	2	1.5	4	1	3
Stud 16	2	2	2	1	1.5	2
Stud 17	4	2	3.5	5.5	3	3
Stud 18	1.5	3	5	1	2.5	4
Stud 19	2	2	1	1.5	1.5	2
Stud 20	1.5	2	1.5	2	2	1
Stud 21	1.5	1.5	1	1	2	2
Stud 22	4.5	3	2	5.5	4.5	2.5
Stud 23	1.5	2.5	3.5	2	4	4
Stud 24	4	2.5	4	2.5	2.5	4
Stud 25	5	2	1.5	4.5	4	1
Stud 26	2	1.5	1	3	3	1
Stud 27	5.5	4	3	6	5.5	4
Stud 28	2	2.5	3	4	4	2.5
Stud 29	1	2	1.5	1.5	1	1.5
Stud 30	3	2	3.5	4	3	3
Stud 31	4	2	3	2.5	4	3

Table 4.32 illustrates the multiple pretest scores obtained by the participants, who underwent an extensive evaluation and thorough assessment based on the criteria specified in the writing marking grid (See Appendix 10). The tabulated summary also encapsulates all the assessments and ratings provided by the two raters, including the scores attained in every facet (content, organisation, and mechanics). The data in Table 1 reveals a notable diversity in pretest individual scores across all writing aspects. The first rater's marks span from 3 to 8 in content, from 2 to 8 in organisation, and from 1 to 3.5 in mechanics. The scores assigned by the second rater range from 4 to 8 in content while from 3 to 8 in organisation, and from 1 to 4 in mechanics. To reduce the number of values for making the subsequent calculations simple and to enhance the accuracy and precision of reported scores, the average scores of the set of grades in content, organisation, and content should be calculated, as illustrated in Table 4.33.

Table 4.33*Pretest Average Scores*

Students	Writing Aspects in Pretest			Final Pretest Scores
	Average Content	Average Organisation	Average Mechanics	
Stud 1	1.75	2	1.75	5.5
Stud 2	2	3.25	3.75	9
Stud 3	3	1.25	3	7.25
Stud 4	5	1.25	3.5	9.75
Stud 5	3	3	3	9
Stud 6	2.25	2.75	3.25	8.25
Stud 7	3.25	2.25	1.25	6.75
Stud 8	3	1.25	1.75	6
Stud 9	3.25	5.25	2.75	11.25
Stud 10	2.25	1.25	1.75	5.25
Stud 11	4.75	2.5	1.5	8.75
Stud 12	5	3.75	2.25	11
Stud 13	4.5	3	1.25	8.75
Stud 14	2.75	2.75	2.25	7.75
Stud 15	3.25	1.5	2.25	7
Stud 16	1.5	1.75	2	5.25
Stud 17	4.75	2.5	3.25	10.5
Stud 18	1.25	2.75	4.5	8.5
Stud 19	1.75	1.75	1.5	5
Stud 20	1.75	2	1.25	5
Stud 21	1.25	1.75	1.5	4.5
Stud 22	5	3.75	2.25	11
Stud 23	1.75	3.25	3.75	8.75
Stud 24	3.25	2.5	4	9.75
Stud 25	4.75	3	1.25	9
Stud 26	2.5	2.25	1	5.75
Stud 27	5.75	4.75	3.5	14
Stud 28	3	3.25	2.75	9
Stud 29	1.25	1.5	1.5	4.25
Stud 30	3.5	2.5	3.25	9.25
Stud 31	3.25	3	3	9.25

Table 4.33 closely reviews and inspects the average scores in the three studied writing components, alongside the corresponding aggregate final pretest scores representing the overall writing performance. Importantly, the average values in content range from and lie between a minimum of 1.25 and a maximum of 5.75. In addition, in organisation and mechanics, the values range from 1.25 to 5.25 and from 1 to 4.5, with the final marks fluctuating between 4.25 and 14. Chiefly, this variability in scores reflects differing writing performances, implying that the participants possess dissimilar writing skill levels and abilities. Of particular note is the significant portion of students (26 students, representing 84%) who obtained marks below 10, with only a minority (5 students, representing 16%) obtaining marks equal to or surpassing 10. This essentially provides insight into the presence of hurdles and difficulties in one or more aspects of writing.

Table 4.34*Posttest Scores According to Both Raters*

students	Rater 1			Rater 2		
	Content	Organisation	Mechanics	Content	Organisation	Mechanics
Posttest Writing Aspects						
Stud 1	7.5	6.5	3	6.5	7	2
Stud 2	6	5	2	4.5	6	3
Stud 3	7	6.5	1.5	7	8	3
Stud 4	7	5	3	8	7	3
Stud 5	8	8	2	8	8	3
Stud 6	3	4	2	5	6	3
Stud 7	6.5	7	1.5	7.5	6.5	2
Stud 8	4.5	5	1.5	6	6	1.5
Stud 9	5	6	2	4	6	1.5
Stud 10	5	6	3	5	4	2.5
Stud 11	5	6	3	4.5	4.5	2
Stud 12	4.5	5.5	2.5	5.5	6	2.5
Stud 13	5	4	1.5	4	5.5	2
Stud 14	6	5	2	5	5.5	2.5
Stud 15	4	3	2	4	5	3
Stud 16	4.5	5	2	6	6	1.5
Stud 17	6	4.5	3.5	4.5	5	3
Stud 18	7.5	8	3	7	7	2.5
Stud 19	7	4.5	2.5	6.5	6	3
Stud 20	2.5	2	1.5	4	3	2
Stud 21	4	2.5	2	5	4	1.5
Stud 22	5.5	5	3	7	4.5	2.5
Stud 23	6.5	7.5	2.5	7.5	7	3
Stud 24	7.5	7.5	3	7	8	4
Stud 25	4.5	5	2	6	4	2
Stud 26	4.5	4	1	5.5	3	1
Stud 27	5.5	7	2.5	6.5	7	3
Stud 28	4.5	2.5	3	6	4	2.5
Stud 29	4.5	5	2	5.5	4	1.5
Stud 30	6	6	3.5	4.5	5.5	3
Stud 31	5	4	2.5	4	5	1

With the aim of discerning the evaluation provided by both raters, Table 4.34 depicts the numerous scores achieved by the participants in the subsequent test following the intervention sessions. They undertook an additional detailed assessment based on the criteria listed in the same writing marking grid (See Appendix 14). Accounting for the sub-scores of each writing component (content, organisation, and mechanics), the data appear to indicate a range of marks, with some being remarkably high or low. In the context of the first rater, the grades range from 2.5 to 8 in content, from 2 to 8 in organisation, and from 1 to 4 in mechanics. The second rater's scoring falls within the range of 4 to 8 in content, of 3 to 8 in organisation, and of 1 to 4 in mechanics. Again, to reach accuracy and precision, the average scores of the set of grades in content, organisation, and content should be calculated, as illustrated in Table 4.35.

Table 4.35*Posttest Average Scores*

Students	Writing Aspects Posttest			Final Posttest Mark
	Average Content	Average Organisation	Average Mechanics	
Stud 1	7	6.75	2.5	16.25
Stud 2	5.25	5.5	2.5	13.25
Stud 3	7	7.25	2.25	16.5
Stud 4	7.5	6	3	16.5
Stud 5	8	8	2.5	18.5
Stud 6	4	5	2.5	11.5
Stud 7	7	6.75	1.75	15.5
Stud 8	5.25	5.5	1.5	12.25
Stud 9	4.5	6	1.75	12.25
Stud 10	5	5	2.75	12.75
Stud 11	4.75	5.25	2.5	12.5
Stud 12	5	5.75	2.5	13.25
Stud 13	4.5	4.75	1.75	11
Stud 14	5.5	5.25	2.25	13
Stud 15	4	4	2.5	10.5
Stud 16	5.25	5.5	1.75	12.5
Stud 17	5.25	4.75	3.25	13.25
Stud 18	7.25	7.5	2.75	17.5
Stud 19	6.75	5.25	2.75	14.75
Stud 20	3.25	2.5	1.75	7.5
Stud 21	4.5	3.25	1.75	9.5
Stud 22	6.25	4.75	2.75	13.75
Stud 23	7	7.25	2.75	17
Stud 24	7.25	7.75	3.5	18.5
Stud 25	5.25	4.5	2	11.75
Stud 26	5	3.5	1	9.5
Stud 27	6	7	2.75	15.75
Stud 28	5.25	3.25	2.75	11.25
Stud 29	5	4.5	1.75	11.25
Stud 30	5.25	5.75	3.25	14.25
Stud 31	4.5	4.5	1.75	10.75

Table 4.35 represents an inclusive compilation of the averaged scores and the final posttest marks. Delving into the details of the final posttest scores, we find a noticeable increase in the values, with 7.5 and 18.5 as the lowest and highest scores, respectively. Remarkably, the vast majority of students (24, constituting 77%) seem to receive marks equal to or above the average (10), spanning from 10.75 to 16. This result is also observed in some of the pretest scores, which were limited to five participants only. Chiefly, in the pretest, none of the students achieved an excellent mark, which is described as anything above 16.

This pattern, however, aligns with the posttest scores, as roughly four students (13%) achieved excellent marks within the range of 17 to 18.5. Surprisingly, all the participants with higher posttest scores (students 5, 18, 23, and 24) showed a dramatic advancement in their writing skills compared to the pretest assessment, where they gained low grades (9, 8.5, 8.75, and 9.75). Additionally, only a minority of students (three, totalling 10%) attained unsatisfactory marks below 10. Table 4.36 summarises and compiles the final pretest and posttest average marks. What is striking while examining the table is the discernible increase in the participants' posttest marks compared to the pretest scores.

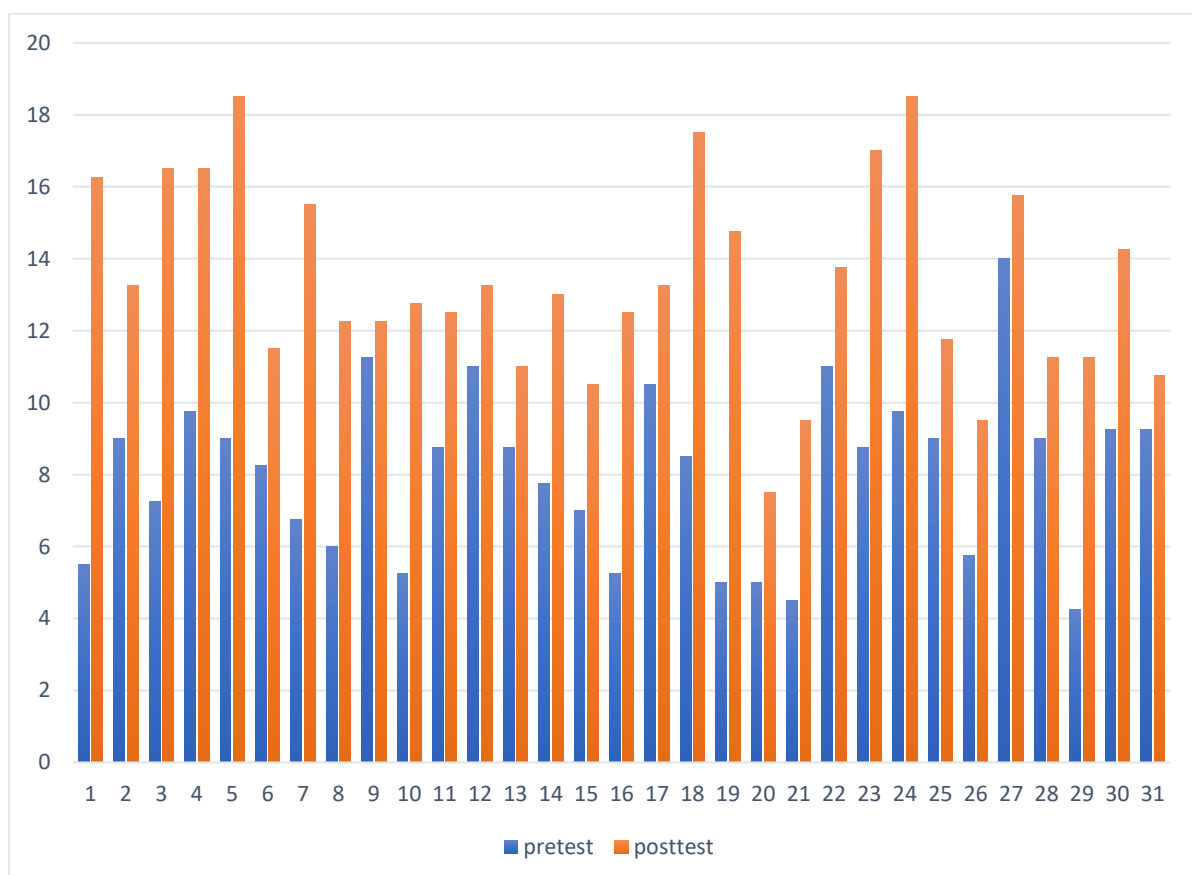
Table 4.36*Summarisation of Pretest and Posttest Scores*

Students	Overall Pretest Marks	Overall Posttest Marks
1	5.5	16.25
2	9	13.25
3	7.25	16.5
4	9.75	16.5
5	9	18.5
6	8.25	11.5
7	6.75	15.5
8	6	12.25
9	11.25	12.25
10	5.25	12.75
11	8.75	12.5
12	11	13.25
13	8.75	11
14	7.75	13
15	7	10.5
16	5.25	12.5
17	10.5	13.25
18	8.5	17.5
19	5	14.75
20	5	7.5
21	4.5	9.5
22	11	13.75
23	8.75	17
24	9.75	18.5
25	9	11.75
26	5.75	9.5
27	14	15.75
28	9	11.25
29	4.25	11.25
30	9.25	14.25
31	9.25	10.75

Statistical tables, as Tables 4.32 and 4.34, often embrace a significant amount of multifaceted and complicated data, containing several main and sub-scores or values. It is for this reason that interpreting results from tables can be challenging. The identification of relationships, improvements, comparisons, and patterns within tables can often be demanding and not applicable. Given that visual aids, such as graphs, diagrams, or charts, simplify the illustration and understanding of complex datasets, and to better reflect the progress between both sets of scores, Table 4.36 is converted to a simplified bar chart, as manifested in Figure 4.30.

Figure 4.30

Pretest and Posttest Scores



The bar chart summarises and reveals the pretest and posttest overall scores obtained by the participants, and which are represented by blue and red, respectively. The x-axis represents the whole number of participants enrolled in the study (31 EFL students at Biskra University) while the y-axis shows the test scores on a scale of 0 to 20. There is variation and irregularity in the heights of the blue and red bars, displaying a fluctuating pattern and inconsistency. Upon a closer inspection of the heights of the bars, we can identify which scores are notably higher. Overall, it seems that the red bars surpass and exceed the blue bars in height, reflecting that the posttest scores are superior to the pretest scores. An interesting point to consider is that some participants (such as students 1 and 19) demonstrate a significant and remarkable improvement in their writing skills, while others (such as students 17 and 31) reveal marginal progress in their writing performance.

To better identify the extent to which the use of concept mapping as a pre-writing strategy impacts EFL students' writing performance in general and writing content, organisation, and mechanics in specific, this section employs a more detailed statistical analysis and techniques. To better observe any potential discrepancies between the overall pretest and posttest scores, descriptive statistics, inferential statistics, and effect size for the overall writing performance are calculated. Fundamentally, to investigate the impact of concept mapping on different aspects of writing, descriptive and inferential statistics, along with effect size, are primarily and separately calculated for content, organisation, and mechanics to see whether concept mapping affects one or more of these elements. This way helps the researcher to provide a rigorous interpretation and draw valid conclusions that might not be immediately apparent by simply constructing bar charts.

4.3.1 Descriptive Statistics, Inferential Statistics, Effect Size for Overall Writing Performance

4.3.1.1 Descriptive Statistics for Overall Writing Performance

Mean comparison is a rudimentary statistical technique that may disclose major differences or similarities between data sets. As a measure of central tendency, the mean (\bar{X}) is a single numerical value that represents the average or central value of a set of scores. The mean is found by dividing the total sum of the set by the number of values in the set. In other words, the mean is calculated by adding up all the values and then dividing by the number of values. Mathematically, it is expressed according to the following formula:

$$\bar{X} = \frac{\sum x}{N}$$

Where:

$\sum x$ is the sum of the scores

N is the sample size.

The final results, including the pretest mean, posttest mean, and mean difference are succinctly delineated within Table and Graph

1. The Pretest Mean:

$$\bar{x}_{pre} = \frac{\sum x}{N}$$

$$\bar{x}_{pre} = 8.05$$

2. The Posttest Mean:

$$\bar{x}_{post} = \frac{\sum x}{N}$$

$$\bar{x}_{post} = 13.34$$

3. The Difference Mean \bar{x} Dif:

Table 4.37

The Mean Difference

Pretest mean	Posttest mean	Mean difference
$\bar{x}_{pre} = 8.05$	$\bar{x}_{post} = 13.34$	$\bar{x} \text{ Dif} = \bar{x}_{post} - \bar{x}_{pre}$
		$\bar{x} \text{ Dif} = 5.29$

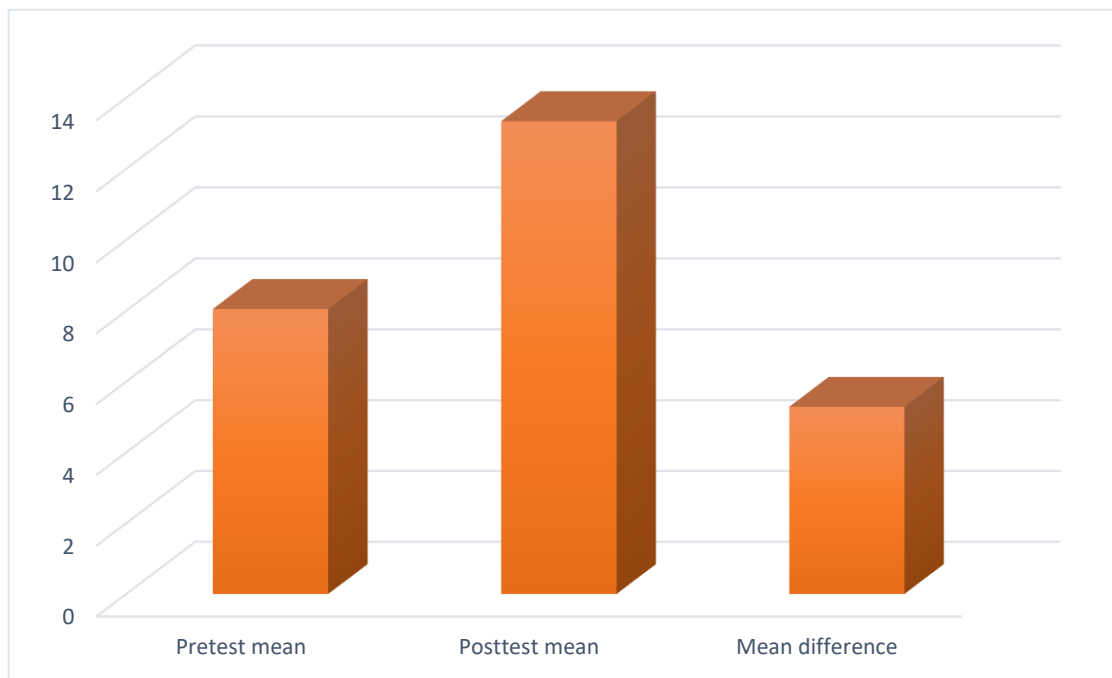
Figure 4.31*The Mean Difference*

Table 4.37 and Figure 4.31 show that the posttest mean exceeds the pretest mean ($\bar{x}_{\text{post}} > \bar{x}_{\text{pre}}$), with a 5-degree increase. Furthermore, we see that the mean difference is a positive number, exceeding zero. As a result, we can deduce that the posttest scores are higher than those of the pretest. Since it is one measure of central tendency, the mean is essential in capturing information about the middle of the dataset and summarising its data. It is important to note that relying solely on the mean may not be sufficiently informative to gain insights about the spread or variability of data. Nor is it adequate to determine whether the statistical difference between the pretest and posttest is significant. To provide a basis for the variability of data points, statistical significance, hypothesis testing, and making inferences, we need to go beyond descriptive statistics and practically provide a systematic framework for inferential statistics and techniques. Importantly, statistical tests are meant to determine whether the null hypothesis will be rejected or accepted.

4.3.1.2 Inferential Statistics for Overall Writing Performance

To examine the impact of concept mapping on overall writing performance, two hypotheses were established, including the null hypothesis and the alternative hypothesis.

Such hypotheses are as follows:

- The null hypothesis (H_0): The use of concept mapping may not enhance overall writing performance.
- The alternative hypothesis (H_1): The use of concept mapping may enhance overall writing performance.

It is generally accepted that the selection of the statistical test highly depends on the type and nature of the data collected. In fact, multiple factors come into play with regard to the decision on the most suitable and applicable statistical test, such as the research question and objective, the distribution of data, the types of variables, and the number of groups in the study.

The current research study seeks to investigate the extent to which concept mapping promotes students' writing performance. Therefore, it compares the difference between two datasets and tests to see if there would be any change in students' writing performance after applying the study treatment. In this vein, and since the data represents test scores, it is apparent that the variable is continuous and numeric. Chiefly, the study works on comparing the results of one group at two different times. It consists of paired data such that each after-writing performance corresponds to a before-writing performance for the same participant.

4.3.1.2.1 Checking Normality. It is expected that large sample sizes typically include data exhibiting a normal distribution, thereby running parametric types of tests. However, we must still verify whether the collected data follows to a normal distribution. This entails analysing some numeric outputs alongside visual representations. In the current study, the normality of the data is evaluated visually and statistically through three major approaches: (1) skewness and kurtosis z-values, (2) shapiro-wilk test, and (3) visual diagrams.

Numerically, evaluating normality involves computing the skewness and kurtosis z-values for both tests (pretest and posttest). They must typically fall within the range of (-1.96 to +1.96). The z-values are obtained by dividing the skewness and kurtosis values by their associated standard errors. The findings are summarised in Table 4.38. Upon analysis using the SPSS software package (refer to Appendix 9), and as table shows, it is determined that the skewness z-values of the pretest and posttest, along with the kurtosis z-values of the pretest and posttest, fall within the interval of -1.96 to +1.96. Therefore, we can assume that our data are normally distributed in terms of skewness and kurtosis.

Table 4.38

Skewness and Kurtosis Z-Values

	Pretest	Posttest
Skewness	0.220	0.165
Standard error	0.421	0.421
Skewness z-value	0.522	0.391
Kurtosis	-0.157	-0.508
Standard error	0.821	0.821
Kurtosis z-value	-0.191	-0.61

Normality can also be quantitatively checked using the Shapiro-Wilk test statistic, whose results are reached at by SPSS. The null hypothesis for this test of normality is that the data are normally distributed. Importantly, the null hypothesis will be rejected if the p-value is below 0.05. Based on the data obtained by the SPSS software package (refer to Appendix 9), it is evident that the p-values for the pretest (0.202) and posttest (0.609) are both above 0.05. The null hypothesis is consequently accepted, thereby confirming the normal distribution of data.

The normality of data distributions can also be indicated through graphical tools, such as histograms and Q-Q (quantile-quantile) plots. A close examination to the histograms, represented in Figure 4.32, for the pretest and posttest generated by the SPSS software package manifests that they have an approximate shape of a normal bell-shaped curve. In addition, the Q-Q plots, visualised in Figure 4.33, indicate that the data dots fall approximately along the line.

Figure 4.32

Histograms Revealing the Pretest and Posttest Scores

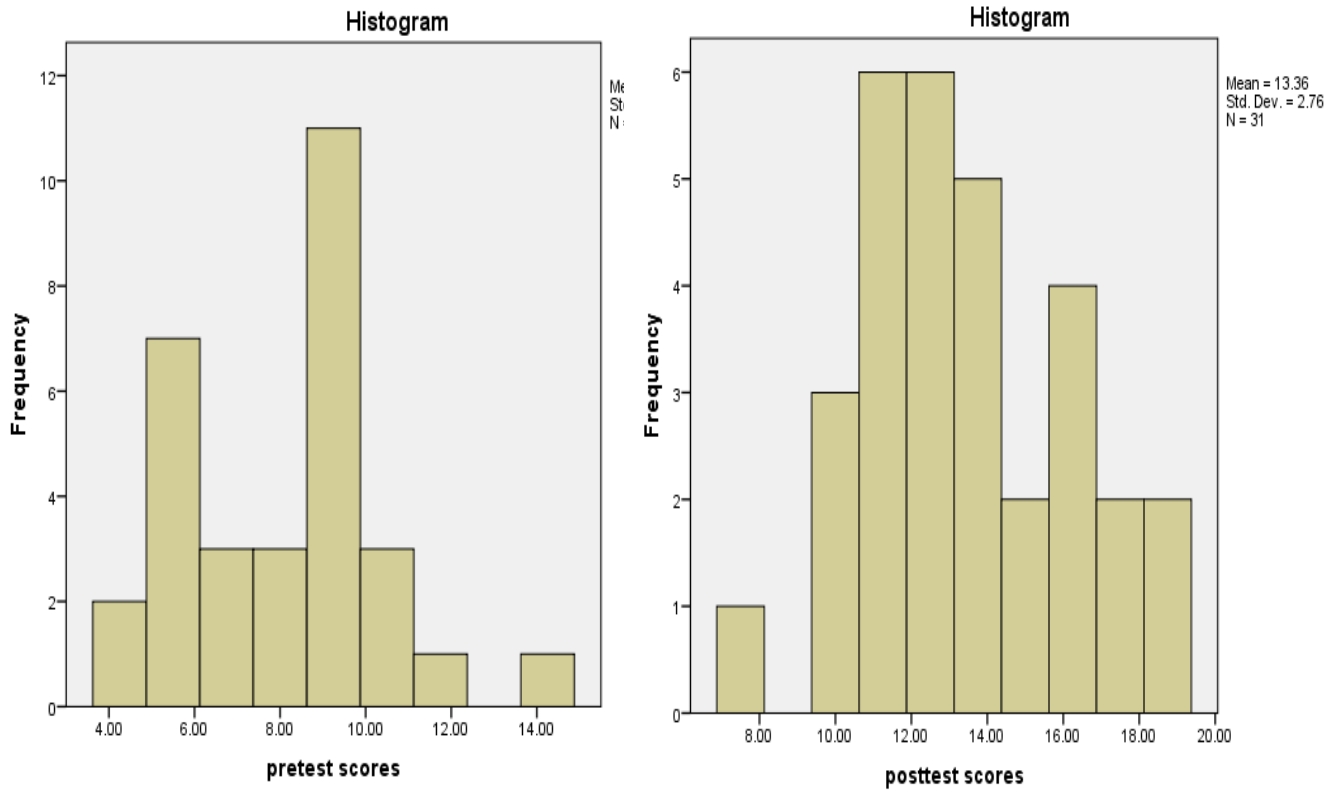
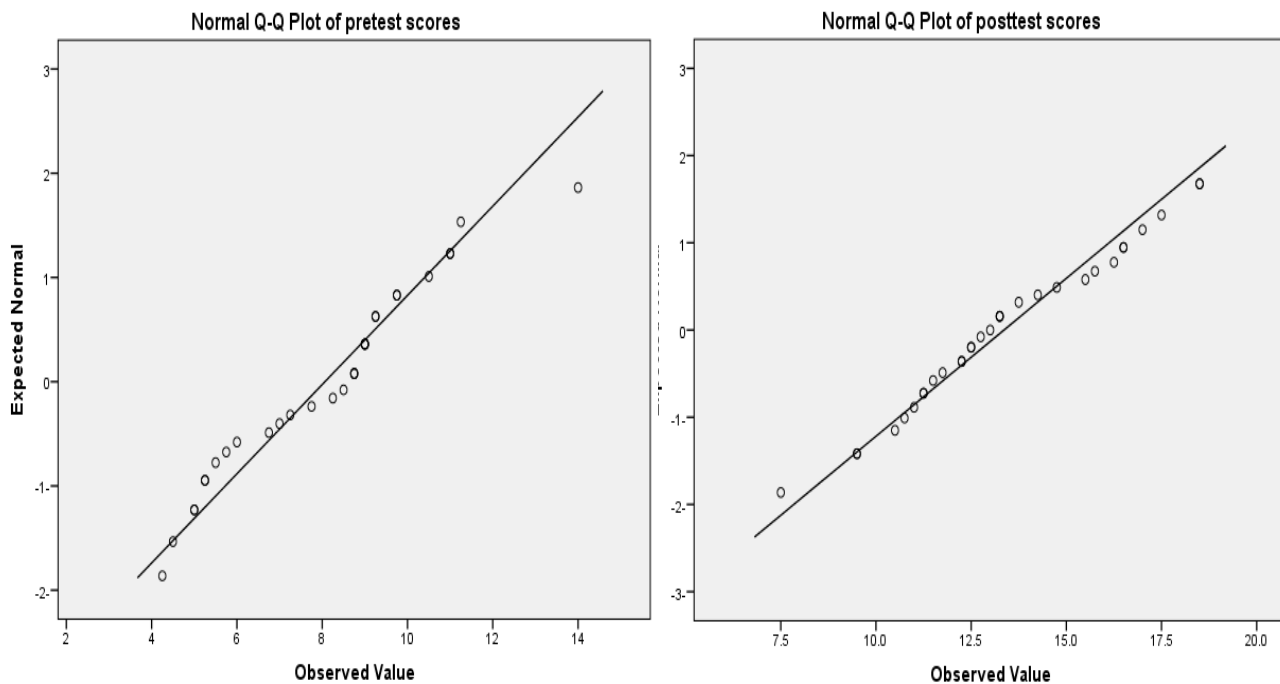


Figure 4.33

Q-Q Plots Revealing the Pretest and Posttest Scores



In view of these observations and approaches, it can be deduced that the data do not differ from the normal distribution pattern, thereby seeking parametric type of tests. More specifically, and considering all the previous factors, the researcher can confidently choose the paired samples t-test.

4.3.1.2.2 Paired Samples T-test. To examine the impact of concept mapping on overall writing performance, a paired samples t-test seeks to ascertain whether the concept mapping posttest scores are significantly higher than the pretest scores, thereby setting out two types of hypotheses. Following the analysis and comparison of multiple measures, only one hypothesis will be accepted and supported by the statistical results. The formulated hypotheses are outlined below:

- Null hypothesis (H_0): There is no significant difference in writing performance before and after using concept mapping.
- Alternative hypothesis (H_1): There is a significant difference in writing performance before and after using concept mapping.

It is worth highlighting that accepting the null hypothesis provides evidence that any observed changes in writing performance scores between the pretest and posttest are more likely due to random variability or chance than to the implementation of concept mapping. As a result, the findings would rather confirm that concept mapping may not have a practical impact on increasing writing skills, at least within the context of the present study. There are two approaches or methods to interpreting the results of a paired t-test, with one comparing the calculated t-value (t) to a predetermined critical value (cv) and the other comparing the obtained p-value (Sig) to a specific significance level (α). Chiefly, both views reach similar and identical conclusions concerning the rejection or acceptance of the null hypothesis.

In this regard, the t-value is compared to and analysed in relation to the critical value. It can

be arrived at through manual computation via a specific formula ($T = \frac{\frac{\sum d}{N}}{\sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{N}}{N(N-1)}}$), just as it

can be obtained and computed using SPSS (See Appendix 9). The results of the t-test, as generated by the SPSS software package, are displayed in Table 4.39.

Table 4.39*Paired Samples Test for Overall Writing Performance*

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	pretest scores - posttest scores	5.298	2.93145	.52650	6.37365-	4.22312-	10.063-	30	.000

Degrees of freedom (df) is $n = 30$

The critical value (cv) is 1.697. This value is obtained from the t-distribution critical values table based on (1) the degrees of freedom, (2) the significance level ($\alpha = 0.05$), and (3) two-tailed prediction.

The t-value is $t = -10.063$. Since the t-test is two-tailed, a comparison between the absolute value of the t-test and the critical value should be sought. The absolute value is ($|t| = 10.063$).

The fact that the obtained t-value is greater than the critical value ($t > cv$) implies that the observed difference between the pretest and posttest scores and the difference between the means are statistically significant, at a probability value of $\alpha = 0.05$. This typically leads to the rejection of the null hypothesis in favour of the alternative hypothesis, confirming that the obtained writing performance posttest results are due to the effect of the application of the concept mapping study treatment.

4.3.1.3 Effect Size for Overall Writing Performance

All statistical tests inform whether the effect is due to chance or not. Nevertheless, they tell nothing about the effect size of the intervention. Beyond statistical significance, the effect size is a standardised measure of the size of an effect, allowing us to measure the magnitude of mean differences. It serves to evaluate the size of the effect (e.g., how large the effect was). It is pertinent to emphasise that the effect size is calculated following the rejection of the null hypothesis after conducting inferential statistics.

That is, if the null hypothesis is accepted, the effect size is not generally calculated. Put differently, the effect size calculation should be run if the effect proves to be statistically significant. Running an effect size calculation would be meaningless if the effect is determined absent (not statistically significant). Cohen's *d* is the most commonly used measure of effect size for *t* tests. In this vein, some conventions were given for interpreting Cohen's *d*, such as having a small effect ($d = 0.20$), a medium effect ($d = 0.50$), and a large effect ($d = 0.80$). The following formula is used to calculate Cohen's *d* for the effect size:

$$\begin{aligned} \text{Cohen's } d & \\ &= \frac{\text{Mean Difference}}{\text{Standard Deviation of the difference}} \\ \text{Cohen's } d &= \frac{\bar{x}_{diff}}{S_{diff}} \end{aligned}$$

Where:

\bar{x}_{diff} is the mean of the difference scores

S_{diff} is the standard deviation of the difference scores

In the context of the current study:

$$\text{Mean of differences: } \bar{x}_{\text{diff}} = \frac{\sum(\text{Posttest}-\text{Pretest})}{n} = 4.69$$

$$\text{Standard deviation of differences} = S_{\text{diff}} = \sqrt{\text{variance}} = \sqrt{8.41} = 2.90$$

Following the provided formula, Cohen's d is 1.62

It should be noted that our d of 1.62 is above 0.8, implying a large effect size. This denotes that the difference between the overall pretest and posttest writing scores is substantial; therefore, the treatment had a large and significant positive effect on students' writing abilities.

4.3.2 Descriptive statistics, Inferential Statistics, Effect Size for Content, Organisation, Mechanics

4.3.2.1 Descriptive Statistics for Content, Organisation, Mechanics

Following the computation of descriptive and inferential statistics for the overall writing performance scores, and to pinpoint the writing aspect(s) concept mapping effectively and actively promotes, the current section is designated for elucidating descriptive and inferential statistics for content scores, organisation scores, and mechanics scores. It also serves to compare and assess the participants' performance in the pretest and posttest with regard to each aspect of writing (content, organisation, mechanics). With this in view, Table 4.40 summarises quantitative information and results generated by SPSS, illustrating the measures of central tendency (mean) and variability (standard deviation) across the different writing aspects.

Table 4.40*Descriptive Statistics for Content, Organisation, Mechanics*

Group statistics mean and standard deviation				
	Pretest		Posttest	
	Mean	Standard deviation	Mean	Standard deviation
Content	3.07	1.31	5.58	1.19
Organisation	2.55	0.98	5.42	1.39
Mechanics	2.43	0.97	2.34	0.58
Totals	8.05	3.26	13.34	3.16

Content

Table communicates a notable increase in the mean content value from the pretest ($\bar{X} = 3.07$) to the posttest ($\bar{X} = 5.58$), implying an improvement in content quality.

It is evident from the results that the standard deviation (sd) of content dropped slightly from $sd = 1.31$ in the pretest to $sd = 1.19$ in the posttest. This decrease conveys the idea that the variability in content scores diminishes in the posttest, indicating that the scores were closer to the mean in the posttest and the participants' performance in content became more comparable.

Organisation:

The mean organisation score reveals a significant rise from the pretest ($\bar{X} = 2.55$) to the posttest ($\bar{X} = 5.42$), signalling that the improvement occurred at the level of organisation.

Additionally, the results suggest an increase in the standard deviation of organisation scores from pretest ($sd = 0.98$) to posttest ($sd = 1.39$), denoting that the participants' performance and scores varied and ranged more widely in the posttest.

Mechanics:

Dissimilarly to content and organisation, it is worth noting that the mean score of mechanics lowered from the pretest ($\bar{x}= 2.43$) to the posttest ($\bar{x}= 2.34$), signifying a lack of progress and improvement in writing mechanics.

The standard deviation for mechanics scores substantially declined from the value of $sd = 0.97$ in the pretest to the value of $sd = 0.58$ in the posttest, demonstrating a decrease in the variability of participants' mechanics scores following the intervention.

4.3.2.2 Inferential Statistics for Content, Organisation, Mechanics

To determine if there are significant differences between the pretest and posttest scores with regard to content, organisation, and mechanics, inferential statistics are computed, summarised, and analysed. Outlined below are the raised hypotheses for the three writing components under investigation:

For content

- Null hypothesis (H_0): There is no significant difference in content scores before and after using concept mapping.
- Alternative hypothesis (H_1): There is a significant difference in content scores before and after using concept mapping.

For organisation

- Null hypothesis (H_0): There is no significant difference in organisation scores before and after using concept mapping.
- Alternative hypothesis (H_1): There is a significant difference in organisation scores before and after using concept mapping.

For mechanics

- Null hypothesis (H_0): There is no significant difference in mechanics scores before and after using concept mapping.
- Alternative hypothesis (H_1): There is a significant difference in mechanics scores before and after using concept mapping.

The results that were calculated and derived using SPSS, are fully presented in (Appendix 9). Since all datasets follow and conform to a normal distribution, the paired samples t-test is adopted. A brief overview of the major statistical measures, which serve to test the formulated hypotheses, is condensed and summarised in Table 4.41.

Table 4.41

Paired Samples Tests for Content, Organisation, Mechanics

	Paired Samples Test Pretest and Posttest			
	t	df	cv	Sig. (2-tailed)
Content	7.995	30	1.697	.000
Organisation	10.284	30	1.697	.000
Mechanics	0.667	30	1.697	.510

As evidenced in table, with a degree of freedom of 30 and a significance level of ($\alpha = 0.05$), the paired samples t-test for content and organisation yielded a t-value of 7.995 and 10.284, respectively. Apparently, both t-values are higher than the critical value (cv 1.697) obtained from the t-distribution table, implying a statistically significant difference between pretest and posttest scores for content and organisation. This commonly results in the rejection of the null hypotheses in favor of the alternative hypotheses.

With consideration to mechanics, the obtained t-value (0.667) is less than the critical value (1.697) ($t < t_{cv}$) at a probability value of $\alpha = 0.05$ and a degree of freedom of $df = 30$. This clarifies the absence of statistical significance between pretest and posttest scores for mechanics, accepting the null hypothesis. Put differently, there was no significant difference in participants' mechanics scores between the pretest and posttest. This brought forth the conclusion that the intervention had a significant positive effect only on content and organisation, but not mechanics.

4.3.2.3 Effect size for Content, Organisation, and Mechanics

Effect size for Content

$$\text{Cohen's } d = \frac{\bar{x}_{diff}}{S_{diff}}$$

The calculations proceed as follows:

Mean difference: $\bar{x}_{Diff} = 2.90$

standard deviation of differences: $s_{diff} = \sqrt{1.30} = 1.14$

Cohen's d: $d=2.54$

The effect size (Cohen's d) of approximately 2.54 is large, indicating a substantial difference between the pretest and posttest scores and a profound effect from the treatment on the aspect of content

Effect size for Organisation

Mean difference: $\bar{x}_{\text{Diff}} = 2.87$

standard deviation of differences: $s_{\text{diff}} = \sqrt{1.37} = 1.17$

Cohen's d: $d=2.44$

Obtaining an effect size (Cohen's d) of 2.44 means that there is a substantial difference between the pretest and posttest scores in terms of organisation

It is worth mentioning that the effect size with regard to mechanics is not computed as long as the effect of concept mapping was proved statistically insignificant.

4.4 Analysis of Students' Interview

The current section is devoted to respond to the fourth research question, which specifically addresses the attitudes of participants towards the use of concept mapping in the pre-writing stage. It also wishes to figure out their views after practically implementing concept mapping, including the improved writing elements, challenges in implementing concept mapping, and solutions to address these problems. To better comprehend the viewpoints, and due to its compatibility with the study aims, thematic analysis, which is one of the most popular qualitative data analysis methods, has so far been adopted. To draw conclusions and gain valuable insights about the data gathered from the interview, a systematic procedure and a predefined set of steps were sought. It involves the systematic process of familiarising oneself with the data, generating codes, generating themes, reviewing themes, defining themes, and writing the findings.

All the data across the four transcripts is consistently coded according to the same schema. Assigning labelling patterns, or simply coding, to segments of text is meant to identify and capture important elements in the data, which principally helps answer the interview-raised questions. To facilitate coding the data and reviewing the patterns of meaning, the MAXQDA software program was used to import, organise, analyse, and visualise the text. With varied coding techniques, MAXQDA breaks down all the manuscripts into manageable and meaningful units, thereby supporting the exploration of recurring themes. The coded interview transcripts, along with the segments of data, assigned codes, and frequency of these codes, are all manifested in (Appendix 11). The coding scheme is also manifested in (Appendix 11).

Q1. How do you consider writing in term of difficulty after the concept mapping training?

Q2. After the concept mapping study sessions, what specific writing components do you think concept mapping works on to improve?

Q3. How does concept mapping impacted the ideas and structure of your written work?

Q4. Does concept mapping help you develop writing mechanics? Explain.

This section seeks to answer the first four interview questions. Although the interview answers are simple and short, they turn out to be productive and informative. To set the tone for the upcoming questions, the interview was initiated with an opening question aiming to rate writing in terms of difficulty following the concept mapping training. To start with, the four interviewees considered writing moderately difficult or easy after initially thinking it to be a difficult practice. This indicates the efficacy of this visual organiser in enhancing students' writing skills and alleviating some of their writing-related hindrances.

The critical examination of the responses also allows us to highlight another incredibly important result with regard to the successes and failures related to the concept mapping application. Seeking input on the specific writing components, concept mapping works to improve and deepen our understanding not only of its effectiveness but also of the areas where it falls short, or simply the aspects it does not adequately address. A description of the established and designated themes with supporting quotations is exhibited below.

4.4.1 Content

The potentiality of concept mapping as an efficacious method to come up with preliminary thoughts during the pre-writing phase of the writing process is strongly highlighted in the four interviewees' transcribed data. Each student expressed how uniquely concept maps can influence idea generation to better improve the content of their writings. Hadil eloquently articulates, "concept mapping helped me to write about many ideas and more examples. I used to forget to mention examples. At the end of my writing, I usually discover that I did not put examples. After learning about the concept map, I see that I mention all examples". While Arafa affirms, "concerning ideas, it helped me to have innovative ideas that I cannot add if I only used free writing", Wissal concisely states, "the main and supporting ideas become numerous".

Concept mapping supports students to pay close attention to details by actively engaging them to map out the material, visualise its details, and understand its parts. The fact that its firmly established hierarchical structure breaks down complicated topics into smaller and more approachable parts provides a means to focus on details, together with the main and sub-concepts. Wissal openly asserts, "previously, I used to forget where to add examples in paragraphs. Now I pay more attention to them without forgetting details". Missing or absent

concepts or links suggest a lack of or incomplete connections and knowledge; therefore, the gaps in ideas become visually apparent.

The responses provided by students succinctly express that the organisation, conciseness, and clarity of ideas can also be optimised through the use of concept mapping. One such case is when Hadil asserts, “before, when I was writing, I had had a mess in my mind. Before concept mapping, I kept repeating the same ideas without realising it. I was always overwhelmed with many thoughts and information. It was stressful to limit and organise my thinking while writing. After using concept mapping, all ideas become more apparent, organised, and not repeated. Concept mapping made me aware of that and makes each statement unique from the others”.

Arafa adds, “after using it, I am able to write concisely and in a way that is direct and to the point”. In this regard, Serine states, “concept mapping adds to the clarity of ideas. Before, I had many ideas that I sometimes spoke about two ideas in one sentence. I go off the topic”. The pictorial and diagrammatic nature of concept mapping allows writers to constantly review, check, and re-check the insertion and relevancy of the developed major and subsidiary ideas to be conveyed in writing. That is, the overall concept map content, which is viewed all in one place, is inspected for clarity, conciseness, and organisation. Therefore, the most essential points or arguments are captured and emphasised while the unnecessary, repeated, or redundant aspects are omitted.

Arafa’s assertion brought attention to the pertinent issue of originality and diversion in the content of written texts. She pronounces, “through the concept map, I can always add my own ideas and observe them to modify them. I used to have simple irrelevant ideas. Now, I can use more ideas, best ideas, and multiple ideas”. It is clear that the concept maps can help authors generate unique and diverse ideas. To clarify, concept map creation is flexible for

alteration and modification by simply changing existing concepts and jotting down other multiple ideas. The fact that writers can clearly visualise concepts and connections and how they relate to each other sparks thinking and creativity, thereby fostering variation in the generated content. Writers are, then, prompted to explore uncovered areas, patterns, and associations and, consequently, brainstorm unique and innovative insights and perspectives.

4.4.2 Syntax

Although there is no clear evidence that concept mapping influences syntax, it is apparent from the reviewees' responses that such a tool contributes to the better structuring and arrangement of sentences within a paragraph. In this vein, Hadil reports, "when finishing drawing the map and I start writing, I do not make many mistakes when writing sentences because I can write full and correct ones". In addition, Arafa says, "I am also able to write correct sentences about supporting ideas and others about examples". Concept mapping helps writers express their ideas smoothly and coherently. The tool provides a disciplined approach to arranging thoughts in paragraphs following a logical progression, which can help to improve syntax in writing.

4.4.3 Purpose and Topic

The comment from Wissal draws attention to yet another essential benefit of concept mapping. It directs writers to maintain focus on the topic and purpose of their writing. An effective concept map provides a visual representation of key information about a well-determined purpose and specified topic. If the writer regularly refers back to the generated concept map while drafting the text, the concept map will typically serve as a guide and source that reminds him/her of the central topic and supporting details. This minimises the potential for going off-topic and purpose. In reference to this, Wissal states, "by following and writing

from my concept map, I could not go out of the topic and goal of the paragraph. I always have this problem. Now, from the beginning till the end, I can focus on only one topic and reason”.

4.4.4 Organisation

A close examination of students’ responses gives context to the utility of concept mapping in boosting sentence arrangement and paragraph organisational structure. Concept maps help brainstorm relevant ideas, depict the connections between them, and structure them logically to form a hierarchical diagram. The latter yields necessary content that would be discussed in the document and would accordingly guide paragraph organisation. Given that the map is organised hierarchically, it is crucial to regularly consult it when drafting the text for it makes it easier to place the key ideas and supporting details logically and coherently in the writing.

The map is flexibly constructed, accepting any addition, omission, and rearrangement in structure or content. This Wissal avers, “I used to write a paragraph in many paragraphs. Now, my paragraph becomes more unified and structured, with clear specific topic sentence and in one block. Also, I used to write directly, so I generally forget to mention ideas and details. So, I go back to add them and my paragraph becomes chaotic”. In simple terms, the major ideas and supporting elements in the map naturally come together to produce a logical and coherent paragraph.

A good concept map entails concepts that flow naturally from the most important or general concepts to the least inclusive and most specific ones. Hadil affirms, “concept mapping also helped me to structure ideas from the most general to the most specific”. Serine adds, “concept mapping clarifies for me the way to write and organise the paragraph. The way to order the ideas is from the most general to the most specific. It helped put the right example in the right idea”. This hierarchical tree structure guides the logical arrangement of sentences and

paragraphs in the piece of writing. The concept map can also make sure that paragraphs have a balanced length and depth by checking how detailed and complicated the diagram is. To support this notion, Arafa assert, “I used to write paragraphs in many paragraphs, not one block. Now, my writing is more organised, stick to the right shape of writing, not exceeding the limited space and words”.

4.4.5 Writing Process

Concept mapping establishes a structured framework for guiding the writing stages by systematically assisting student writers in planning, drafting, and revising their work. Wissal maintains, “now, I can write a paragraph after following all the writing steps. Before, I wrote directly on paper, and I committed many mistakes”. Arafa remarks, “concept mapping also helped me to brainstorm ideas and write about them. It also helped me to follow the track of these ideas and revise them”. As a graphical organiser, concept mapping seeks to develop a well-ordered writing outline and plan the writing task, thereby reinforcing the generation of ideas and the gathering of information. This can be accomplished by exploring ideas, jotting down key and supplementary concepts that represent them, and incorporating adequate connections between them. Once they have produced an understandable and accurate concept map, students can use the created map as a reference point for drafting the text and for constantly ensuring the inclusion of important elements. A comparison should be made between the map and the draft, which is later revised for any adequacies, repetitions, and irrelevancies.

4.4.6 Mechanics

It is important to note that concept mapping allows students to think about the structure and expansion of the content of their writing. They become more aware of the beginning and end of their ideas, thereby focusing more on such major elements as the topic sentence, supporting sentences, examples, and concluding sentence. Hadil clarifies, “before, I did not know where the idea started and finished. I was just writing randomly. Now, concept mapping helps me to know the topic sentence, details, and examples, and I then put the full stop to match them. That is all, I don't see any other effect”. During this course of action, and through the use of concept mapping, students may become more conscious of some patterns of errors in relation to punctuation.

Nevertheless, the tool does not appear to contribute to an observed advancement in writing mechanics. It does not show any remarkable and discernible improvement in spelling, grammar, or sentence structure. Following this line of thought, Arafa, Wissal, and Serine openly declare the absence of a relationship between concept mapping and writing mechanics. Specifically, Arafa communicates, “I do not feel any change in my writing when it comes to mechanics because I still have the same problems even after using concept mapping”. Wissal voices, “I cannot see any change in writing mechanics after using it”. Serine states, “not really, I still make the same spelling and grammar mistakes. I see it is not helpful in writing mechanics”.

Q5. How do you find the use of concept mapping compared to other pre-writing strategies you've tried?

One of the interview questions specifically strives to elicit students' perspectives and opinions on which strategy-concept mapping or previously used pre-writing strategies-is better for writing effectiveness. This is a good way to determine their preferences with respect to various pre-writing strategies, especially after the concept mapping treatment sessions. Reflecting on this, the four students convey:

Hadil: *"I used to apply free writing and listing. They are helpful, but they did not help me organise ideas. I was writing in a real mess. After attending with you and having all the tasks done, I see that the strategy of concept mapping sharpens thinking, so it is more beneficial than freewriting and listing."*

Arafa: *"I have never used a writing strategy because I used to write the text directly. That is why all the ideas keep flying around my head, and I am always lost in the flow of ideas. Since I started using concept mapping, I liked it. It is a guide for me because it ameliorates my writing style."*

Wissal: *"I always use free writing but, honestly, concept mapping is much better and more straight-forward."*

Serine: *"Concept mapping is easier than other strategies, especially that I usually use mapping. My mapping was not as effective and systematic as concept mapping. It was just about drawing shapes randomly."*

The analysis of students' responses signals that they did not perceive their formerly employed pre-writing strategies as easy and helpful as concept mapping, particularly in terms of organisation. Overall, concept mapping provides an organised, visually appealing method for generating and structuring ideas, yielding greater benefits than free writing and listing.

Attitude

Q6. What is your attitude towards the use of concept mapping in the pre-writing stage?

This conclusion brings up another question that essentially intends to ascertain the students' attitudes towards the implementation of concept mapping in the pre-writing stage. Upon reviewing and going over different responses, it is disclosed that the interviewees had a productive and satisfying experience with the concept mapping treatment, displaying an especially favorable attitude towards the tool. This is evidenced by the expression of Arafa when she proclaims, "my opinion about concept mapping is so positive. I see it is a beneficial strategy; therefore, I am so satisfied with it". Serine elaborates, "it is so helpful and motivational. I liked it a lot. I am really excited about it". To further illustrate, Wissal adds, "it is more helpful than freewriting and listing. It helped me a lot, so I am happy about it".

To give more details, Hadil accentuates the applicability and versatility of concept mapping in clarifying concepts and relationships. She reports, "t is a great tool. It should be used in all subjects. After my exposure to concept mapping with you, I tried it with my brother in history, geography, and mathematics. It helped him to understand and memorise the lesson easily. Although I know mind mapping, this one is better because what is special about it is the relationships. In mathematics, he could not differentiate between functions. So, I introduced him to a simple concept map to show and differentiate between different relationships". The fact that she successfully used it to explain to her brother some patterns in geography and mathematics, first, advocates its incorporation and integration across many more courses and, second, showcases the potential advantage of implementing this technique beyond the classroom context.

Challenges and Solutions

Q7. What challenges, if any, did you encounter while implementing concept mapping in the pre writing stage? Explain

Q8. What do you suggest to solve these problems?

The interview further encompasses a question devoted to identifying and detailing all possible obstacles that students confronted during the treatment sessions and while putting into practice and using the concept mapping strategy. This inquiry not only seeks to identify these hurdles, but it also culminates in a follow-up question, inviting students to propose thoughtful suggestions aimed at alleviating such challenges. The inspection of responses brings to light the interviewees' engagement and satisfaction with their involvement and participation in the study. They reported the ease with which the concept map is constructed, conveying that the map-making process is simple, straightforward, and effortless. Arafa maintains, "concept maps are so easy to generate and practice". Hadil further comments, "the concept map is easy to learn and draw. I learned it easily and all my maps were similar to yours"

It is paramount to underscore that the interviewees also remark that time constraints and insufficient background knowledge could impede their ability to do so effectively. Following this, Hadil states, "I did not face any challenges in the way of making maps and applying them in the pre-writing stage. However, when I do not have enough information about the subject of the paragraph, I find difficulty brainstorming many ideas and put them in the map". Moreover, Arafa mentions, "The only problem I faced is that it seems to take some time to come up with ideas, especially if I do not know them before drawing the map". Wissal asserts, "I always have the problem of time; I don't have information about some topics. I find generating it challenging. It took time when I first tried it". Serine notes, "I didn't face problems. Exceptionally, it is sometimes difficult to draw a map when we don't have background

knowledge about the issue we are asked to write about. This is a serious problem that we all face in all writing tasks and with all writing strategies, not only concept mapping”.

As a newly learnt strategy, concept mapping requires time to be learned, practiced, and mastered. It commonly demands sufficient time to truly comprehend and fully grasp its basics and gain proficiency in its use. As they practice and gain experience with the strategy, individuals progressively increase their abilities and become more competent at employing it efficiently. That is, continued practice and ongoing dedication are essential to mastering concept mapping and gaining knowledge about its components. On this matter, Hadil reports, “we need more practice and to do it over and over again to draw the concept map faster”. Furthermore, Arafa states, “providing more practice until we learn how to use it in a quick way is the solution that I can suggest. As people say, practice makes perfect”. Similarly, Serine voices, “I cannot suggest anything rather than practice because concept mapping is so easy to learn. I believe the more we do tasks related to the concept map, the better we will be at it”.

Background knowledge of the writing topic is an essential component in constructing effective Novakian concept maps and extending their scope, relevance, and depth. With little or no prior knowledge of the subject, writers may fail to discern and capture major and minor concepts, relationships, and connections, therefore, finding it challenging to develop different parts of the map and to draft the text on the basis of these parts. Hadil states, “I did not face any challenges in the way of making maps and applying them in the pre-writing stage. However, when I do not have enough information about the subject of the paragraph, I find difficulty brainstorming many ideas and put them in the map”. Pertaining to this, Serine mentions, “it is sometimes difficult to draw the map when we don’t have background knowledge about the issue we are asked to write about. This is a serious problem that we all face in all writing tasks and with all writing strategies, not only concept mapping”.

A concept map without a basic understanding of the subject may yield inaccuracies, omissions, and fallacies, detracting from its accuracy, completeness, and comprehensiveness. In order for it to be effective and meaningful, the concept map necessitates some level of prior knowledge to draw upon. Hadil remarks, “we should have a good background about the subject, such as to read first or conduct a literature review before drawing the map”. In many cases, with unexplored or unfamiliar subjects, a foundational understanding and exploration of the writing topic establish an essential step. This can be realised through reading relevant materials such as scholarly articles, textbooks, and online resources, or through engaging in discussions, attending lectures, and watching instructional videos.

The closer analysis of answers demonstrates that one of the students brought up a pertinent issue based on which the theme ‘topic choice’ emerges. Wissal proposes starting to practice concept mapping with daily life topics by asserting, “I suggest to start with everyday topics, from easy and simple topics, until we get used to it”. Clearly, before engaging in more challenging subjects, starting with simple and undemanding topics is essential to practicing concept mapping. This is because familiar daily life topics embrace accessible knowledge that can be easily tackled and broken down into ideas, concepts, and relations.

Q9. Why or why not do you plan to continue using concept mapping in your future writing endeavors?

Q10. Feel free to add any recommendation to make the use of concept mapping as a pre writing strategy more efficient.

The final two questions serve the purpose of evaluating students' intentions for future usage of concept mapping and to provide an opportunity for them to provide recommendations for improving the use of this organiser in writing. If a sense of willingness to employ concept mapping in the future is expressed, it implies that the students perceive that the tool can potentially assist them in an assortment of situations, thereby acknowledging its importance

and value. In contrast, if a sense of reluctance is conveyed, it can be a sign that they regard it as irrelevant, unsuitable for their demands and needs. A closer review of each student's responses discloses that all interviewees are committed to incorporating concept mapping not only into their writing projects but also into other courses, future endeavors, and practices, such as civilisation and linguistics, memorisation, note-taking, and lesson summarisation.

Accordingly, Hadil declares, “yes, I will use it. If I have time, I will draw a complex concept map. If I do not have much time as in exams, I will draw a simplified one. So, in all cases, I will use it. I will use it in writing, as I will use it in civilisation and linguistics because they have several interrelated ideas”. Arafa notes, “Yes, I will definitely use it not only in written expression but also in many other courses such as civilisation. Civilisation contains many ideas that are difficult to be memorised”. Likewise, Wissal observes, “Yes, I will use it even in memorising facts especially in other modules with many lessons, such as civilisation and linguistics. I will also use concept mapping in note taking while the teacher explains the lesson”. In a similar fashion, Serine voices, “yes, I will surely use it in all my writings and to summarise lessons for revision”. These answers also draw attention to the concept mapping’s versatility and effectiveness as a visual thinking tool across a wide array of tasks and contexts.

The total number of three students endorses the early adoption of concept mapping in education. This stands as a suggestion for optimising the implementation and effectiveness of concept mapping. To exemplify, Hadil expresses, “I suggest that concept mapping should be practiced at an early age, since childhood or primary school”. Arafa maintains, “I suggest to be used from a younger age so that students get used to it. Although I am an auditory learner, it helped me a lot”. Wissal reports, “I do not have any recommendations but to start teaching it earlier than this”. Early concept mapping instruction and exposing students to the concept mapping strategy at a young age can better help students grasp and get familiar with its components, principles, and applications. With regular practice over time, they can gradually

build upon their understanding to reach mastery and a strong foundation for concept mapping skills.

Conclusion

This chapter outlined and presented all the inspected intricacies that were essentially required for reaching findings pertinent to the established study endeavors and aims, as well as for answering the four key research inquiries. It was primarily geared towards providing a comprehensive compilation of the collected datasets as well as a complete display of all the corresponding results originally obtained from the student questionnaire, teacher questionnaire, tests, and student interview. In essence, this chapter attempted to demonstrate a thorough and in-depth review and analysis of textual and numerical data, with particular attention placed on the used data analysis procedures, analytical methodologies, and statistical packages.

**Chapter Five: Synthesis of the Findings, Summaries, Pedagogical
Recommendations and Implications, Limitations of the Study, and
Suggestions for Further Research**

Introduction

5.1 Synthesis of the Findings and Summaries

5.2 Pedagogical Recommendations and Implications

5.2.1 Recommendations for Teachers

5.2.2 Recommendations for Students

5.3 Limitations of the Study

5.4 Suggestions for Future Research

Conclusion

Introduction

The current chapter summarises and synthesises the major findings arising from the research objectives and questions. As we engaged deeply in the intricacies of this inquiry, we not only strived to unravel the most prevalent obstacles in writing, but also to provide support for elucidating the major causes of such difficulties, examining the practicality of concept mapping in promoting writing performance, and identifying the attitudes arising from its implementation. This involves interpreting and putting together different descriptive data, statistical measures, and numerical outputs collected during the research process. Upon synthesising the results and data obtained from all instruments, and to guide the principled application of concept mapping, this chapter additionally sets out to offer some strategic recommendations and pedagogical implications tailored to both students and instructors. In conclusion to the chapter, a set of recommendations and suggestions for future research exploration and endeavors are provided.

5.1 Synthesis of the Findings and Summaries

Encouraging and promoting effective writing skills has captured educators' attention across a multitude of disciplines and settings. Delving into inventive approaches or strategies for advancing writing proficiency has emerged as a central concern within educational research. As such, the current investigation delves into the relationship between the concept mapping pre-writing strategy and the writing performance of third year students of English at Biskra University, striving to contribute to the available body of literature on writing pedagogy. The general, overarching aim of this study is to evaluate the efficacy of employing concept mapping in the pre-writing stage for promoting the writing abilities and performance of third year students of English at Biskra University.

More specifically, the current research work explored the basic difficulties faced by EFL students while immersed in the writing task, specified the factors underlying EFL students' writing struggles, examined the practicality of concept mapping as a means to promote students' writing performance, and identified the attitudes of students towards the use of concept mapping in planning the writing activity. To achieve the primary and secondary aims, a Mixed-methods approach was employed, utilising a student questionnaire, teacher questionnaire, pretest and posttest, and a student interview. This synthesis chapter bridges the gap between the research questions and data interpretation. Chiefly, it serves to integrate the findings derived from all the data gathering tools, providing a thorough analysis of multiple observations, trends, patterns, and discrepancies.

RQ1: What are the main difficulties encountered by third year students of English at Biskra University while engaged in the writing task?

The first posed question in the current investigation expressly delved into pinpointing the underlying primary challenges experienced and confronted by third year students of English at Biskra University throughout or while engaged in the writing task. In line with this, the hypothesis put forward posited that potential writing difficulties may encompass the inability to generate pertinent ideas and connect them logically. To gather essential data, a pre-treatment student questionnaire, which was provided and administered to the study sample, was later analysed using tabular and graphical techniques and displays. In pursuit of eliciting more informative and detailed responses, this tool incorporates, alongside multiple-choice prompts, conventional open-ended questions.

The student questionnaire serves as an initial step to examine the participants' basic writing skills, challenges, and other essential criteria. The study, which embraces a total of 31 participants, is female-centered, reflecting a predominance of females in the sample. The respondents completed the questionnaire, which primarily supplied useful information on writing preferences, frequency and reasons for writing practice, most challenging writing stages, writing struggles, and employed pre-writing strategies. It also establishes a valid way for ascertaining students' familiarity with and use of concept mapping prior to the study intervention.

A lack of consensus on which language skill is more challenging conveys a disparity in the perceived difficulty of language skills. The observation that a decreased number of students are experiencing difficulty with reading and listening, while a considerable equal number of students are struggling with writing and speaking is suggestive of the fact that receptive language skills, involving practices such as reading and listening, are relatively more approachable and less demanding to students compared to expressive skills, yielding speaking and writing. This is because expressing oneself in written and spoken form within academic or social contexts requires generating thoughts, arranging ideas, picking suitable vocabulary, forming sentences, and adhering to the social conventions of language use. This makes it a harder procedure in comparison to comprehending language input.

The vast majority of students realise and acknowledge the importance and value of writing. Grasping and appreciating the significance of this skill can motivate students to actively improve their writing skills, immerse themselves in writing tasks, and seek opportunities for practicing writing. Accordingly, this is likely to enable them to enthusiastically participate in the study sessions and involve themselves in various planned activities. Similarly, recognising the participants' enjoyment and frequency of writing may offer insights on their writing skill development. Those who enjoy the act of writing are more

inclined to develop intrinsic motivation to write more proficiently and participate in writing tasks more willingly. The frequency of writing helps in the promotion of content, vocabulary usage, sentence structure, grammar, organisation of ideas, mechanics, purpose and audience awareness, and writing steps.

In the context of the current study, only a minority of students wish to engage in writing for communication purposes or out of pleasure. Nevertheless, and despite their prevailing enjoyment of writing experiences, the majority of students do not participate in and involve themselves in writing regularly. Instead, they appear to occasionally participate in and partake in writing activities when they are primarily the focus of assignments or as part of academic requirements. They predominantly write in English to exceptionally perform definite professional tasks and accomplish specific academic requirements such as assignments, essays, and examinations.

Engaging in writing when assigned to do so or in response to external prompts may likely develop limited writing skills, expressing an array of difficulties in producing effective and fluent text. This is clearly reinforced by the collective 'yes' response (31 students), reflecting an agreed-upon acknowledgment of writing challenges. The fact that the four stages of writing were selected at least once suggests that the students encounter different writing hurdles in one or more stages, and which may persist throughout the entire writing process. Such obstacles may potentially concern the phase of generating, gathering, and organising ideas or the phases of creating the first draft, revising the content and structure, and editing the writing mechanics.

To put it more precisely, the various writing difficulties faced by respondents include a notable lack of ideas about the writing topic or theme, complexity in organising and connecting ideas logically, inaccuracy in word choice, incorrect use of writing mechanics, inappropriate sentence formation and presentation, and difficulty with prior knowledge activation. Chiefly, to corroborate the previously-chosen option selections, teachers were additionally consulted, based on their experience, to solicit potential students' writing difficulties. The fact that every choice received at least one selection denotes that students' perplexities in writing are not only confined to basic limitations in grammar usage, sentence structure, punctuation, and vocabulary, but they also transgress to notable troubles in connection with word choice, idea scarcity and organisation, and prior knowledge activation.

These thorough findings lend support to the hypothesis asserting that possible writing challenges may comprise the incapacity to generate significant ideas and connect them logically. Nevertheless, building upon empirical data and evidence, it is noted that writing difficulties encompass more than just the lack of ideas and the complexity of connecting them logically. In essence, they could further include poor word choice, improper use of writing mechanics, improper construction and presentation of sentences, and trouble activating prior information.

In the array of writing stages, and since it was the most commonly chosen response, the pre-writing phase stands out as the primary hurdle that poses the greatest challenge for students, highlighting the importance of addressing issues pertaining to planning, generating thoughts, and organising ideas prior to initiating the writing task. On this basis, the application of the concept mapping pre-writing strategy has been imperative and justified. Writing with a limited range of ideas and within a narrow scope of perspectives contributes to repetitive, predictable, and less engaging content, leading to the continuous revisiting and exploration of the same thoughts and themes. An insightful and well-constructed paragraph actively seeks out novelty

and variation in content, conveying multiple supporting sentences and details. Each point provokes thought and provides extra information that supports and further develops the central theme established in the topic sentence.

In addition to the limited set of ideas, the quality of writing may also suffer when constraints occur at the level of activating prior knowledge about the writing topic. Without this foundation, the inaccuracies and complexities of the topic cannot be revealed. Inability to activate relevant background knowledge obstructs putting forth appropriate arguments and examples by impeding the generation of meaningful thoughts, organising conjoined ideas, and drawing logical connections.

Since word choice is an important component criterion of effective writing, careless or inappropriate selection of words affects the style, tone, and voice of the piece. Certain words have a greater impact than others. That is why the appropriate and precise selection of vocabulary in writing helps evoke specific feelings and captivate the reader by transmitting the desired message to the intended audience. Difficulties in choosing or misusing the most appropriate words can obscure meaning and lead to miscommunication, confusion, or a misconception of the writer's intention. This typically influences the text's cohesiveness and undermines its overall quality. The careful consideration of the language used by the writer adds to the clarity and conciseness of the written production.

In order for it to convey ideas appropriately, a high-quality written document reflects a proficiency in and a strong grasp of writing mechanics and grammatical rules. Errors pertaining to capitalisation, punctuation, abbreviation, layout, spellings, and handwriting, along with sentence construction and formation tend to confuse the writer's intended meaning, leading to misinterpretation and misunderstanding on the part of the reader. This is especially true in academic situations when inadequate writing mechanics and poorly constructed sentences

diminish the quality of the written communication, making it sound less impactful, persuasive, and professional.

It is important to note that some writing difficulties can be targeted by offering support and guidance on special approaches and strategies during the pre-writing phase. Of particular note is the observation that the vast majority of participants are strategic in approaching their writing tasks. To achieve their writing goals, they appear to intentionally use either a single or multiple pre-writing strategies. Their choices were primarily directed towards freewriting and, then, brainstorming. This is because freewriting and brainstorming are thought to be simple, with direct steps. They are less structured, nonlinear methods of generating thoughts. Those who seek such strategies express ideas freely and easily, without the need to focus on accuracy and correctness or engage in editing language mechanics. Questioning, researching, and graphic organisers were also selected by some participants as other used pre-writing strategies.

Although a significant portion of individuals display knowledge of and manifest familiarity with an assortment of pre-writing strategies, such as freewriting, clustering, questioning, researching, and graphic organisers, only one seems to possess an awareness of the concept mapping pre-writing strategy. In this regard, s/he stands out as the only participant, within the entire sample, who declares the employment of concept mapping while planning for the writing task. Despite this acquaintance, and building upon the provided definition, the student does not seem to have a good grasp of or a deep understanding of the elements and peculiarities of this strategy since s/he fails to simply mention or discuss any of its defining features. Accordingly, this necessitates a thorough instructional approach to the specificities of concept mapping.

RQ2: What are the most prevalent causes of writing difficulties among third year students of English at Biskra University?

Delving into the most frequently occurring causes of writing difficulties among EFL students, the second research question sought insights obtained from a semi-structured questionnaire administered to a sample of ten teachers. In accordance with this aim, the formulated hypothesis contended that potential reasons contributing to the writing difficulties of third year students of English at Biskra University may well involve insufficient opportunities for practicing writing coupled with the disuse of effective writing strategies.

The surveyed teachers have been teaching the course of writing for varied durations, typically between 4 and 12 years. They have also earned differentiated college degree levels (possessing either a doctorate or magister degree), with teaching experience varying from 5 to 17 years at the university level. Recognizing the educators' degree level, diverse durations of teaching, and years of writing instruction help give an indication of their expertise in recognising struggling writers, discerning writing hindrances, and introducing effective writing strategies.

On the teacher side, teaching writing can also be a nuanced task because of the complexities and challenges this skill poses and brings about. In view of this, and in consideration of their experiences regarding writing instruction, the teachers within the study sample leaned heavily towards choosing "challenging" and "difficult", with none of them selecting "easy". The factors that contribute to the difficulty of teaching writing can be grouped into several classes, a couple of which are the technical challenges, cognitive factors, psychological and emotional factors, and instructional challenges. Technically, teaching and providing guidance on how to learn or retain rules and principles directing written communication, including the conventions of grammar, vocabulary, and formatting is

demanding. This is especially true when students have disparate linguistic backgrounds and dissimilar language proficiency levels.

Writing instruction can also pose a set of cognitive challenges, such as the concern of guiding students to analyse information critically, generate logical and strong evidence, build the skills of persuasion, structure paragraph components logically and sequentially, synthesise and build upon their prior knowledge, and build writing problem-solving skills. Creating a welcoming and supportive psychological learning environment requires extensive commitment from the teacher. This arises from the fact that expressing oneself effectively through writing can also be affected by psychological and emotional variables. Teachers sometimes find it demanding to assist students with low self-esteem and confidence and help them overcome frustration and anxiety. Instructional challenges can be manifested in the way constructive feedback is provided and instructional approaches can be adapted and tailored to meet and accommodate varying learning styles, needs, and abilities.

Furthermore, the analysis of the teacher questionnaire effectively communicates that realising the determinants and rationales behind students' writing impediments holds importance, for they help understand multiple writing difficulties and decide on the most suitable supportive plans and targeted interventions. The variety of underlying factors contributing to writing troubles signifies that such complexities are not exclusively the result of a lack of effort in writing. Nevertheless, they can additionally stem and emerge from the neglect of effective writing strategies, the disrespect of the writing stages, a lack of opportunities for practicing writing, reading opportunities, writing under time constraints, having poor background knowledge, and a lack of language competence.

Implementing writing strategies provides tools for articulating ideas clearly, arranging thoughts logically, and structuring texts coherently. Without writing strategies, the writers' ability to produce a well-supported and organised manuscript may be impeded. Paying requisite attention to and respecting varied writing process stages helps writers properly plan for and explore adequate content, guiding them through planning, drafting, revising, and editing. Little writing practice, timed writing, and restricted reading opportunities are also highly determined as factors precipitating writing challenges.

Chiefly, frequent and regular writing practice allows the writer to consistently train on how to precisely generate ideas and easily move through the writing stages, maintaining appropriate and sound grammar, mechanics, vocabulary, and content. Although it may be sometimes productive, time-limited writing often increases the feelings of stress, pressure, and distraction that lead to little focus, poor planning, disjointed ideas, and inaccurate written content. Fundamentally, without regular reading, students may have limited exposure to language patterns, vocabulary, text models, and writing styles, all of which are rudimentary for producing well-structured and more engaging written communication.

Among the set of writing influences lies background knowledge on the subject matter. Sufficient and good background knowledge on the topic of writing leads to the exploration and generation of deep, accurate, and relevant content. It also serves to synthesise information and draw informed connections between ideas. It is especially obvious that deficiencies in language competency will result in a weak grasp of basic language aspects, such as spelling, punctuation, grammar, vocabulary, and syntax, leading to errors and improper language usage. Consequently, this diminishes students' ability to articulate and express themselves effectively through writing.

The findings and assorted interpretations collectively affirm the acceptance of the hypothesis, providing a basis for elaborating on the suggested causal factors. Not all writing complexities encountered by third year English students at Biskra University may be exceptionally attributed to a lack of writing practice or the disuse of efficient writing strategies. In fact, they can also result and originate from disregarding the writing stages, a lack of reading opportunities, writing under time constraints, having inadequate or poor background knowledge, and a lack of language competence.

It is important to note that teacher participants specify writing practice, teacher feedback, introduction to writing stages, model texts, and moral support as the most common ways of describing their role in aiding low achievers in writing. Introducing students to regular writing activities and practices, along with regular feedback, can indeed work to alleviate writing difficulties. Just like other skills, writing ability improves through regular practice, which allows students to develop a stronger command of the writing rules and conventions and to better develop the ability to write quickly and coherently.

Fundamentally, and regardless of its type, teachers' feedback on writing assignments or in-class activities guides students towards what constitutes high-quality and proficient writing, prompting them to consider the areas of strength as well as the aspects needing attention and improvement. It encourages students to refine the effectiveness of their work and improve its quality by critically revising and reviewing it for any irrelevancies with regard to content, purpose, word choice, organisation, grammar, and mechanics.

Just like writing practice and teachers' feedback, instructing students to adhere to an ordered set of organised and established stages adds to the overall effectiveness of written communication, initiating from the early step of idea generation to the stage of editing the end product. Although it was acknowledged by only one teacher, introducing struggling writers to well-written model pieces and exemplars is fundamental in providing examples of proper and

varied styles, vocabulary, punctuation, mechanics, grammar, and conventions, along with how to write and structure introductions, body paragraphs, and conclusions. Chiefly, with their encouragement and positive reinforcement, the teacher can create a safe and non-threatening environment that encourages student writers to make mistakes, write regularly, and learn from their writing experiences.

With acknowledgement and awareness of the significance of the pre-writing stage, all the teachers, within the studied sample, typically tend to regularly introduce their students to a multitude of strategies to be initially employed while generating ideas. The selection of such strategies encompasses brainstorming, freewriting, questioning, clustering, and researching, together with other outlined strategies, namely listing and mind mapping. In this context, graphic organisers usage is infrequent among teachers, with only five actively prompting students to apply mind mapping, listing tables, concept mapping, a tree chart, and an idea wheel in the stage of pre-writing.

Notably, concept mapping arose and was identified as one of the participants' responses, showing that only three teachers are familiar with the investigated approach. This suggests that the majority of professors, who afterwards expressed interest and concern about the concept mapping strategy, do not encourage students to use such a tool in their writing, in general, or during the pre-writing stage, in particular. Regarding this issue, there are two reasons preventing teachers from introducing idea mapping. The first derives from a lack of familiarity and past experience with the method, while the second reflects some teachers' belief that regular and daily writing themes don't require the use of a visual aid like a concept map.

RQ3: To what extent does the use of concept mapping as a pre-writing strategy impact the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics?

Within the scope of this study, the third research question aims to gain a profound understanding of the practical effect of integrating concept mapping as a pre-writing strategy on EFL students' writing performance in terms of content, organisation, and mechanics. It was hypothesised that the implementation of such a tool during the pre-writing stage may foster the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics.

To obtain comprehensive data, it is essential to initially evaluate the influence of concept mapping on overall writing performance before progressing on to examine its effects on every single writing component. Accordingly, to better answer the research question, it was perceived as practical and beneficial to formulate three subsidiary hypotheses corresponding to each individual writing component. To make an informed decision on whether to accept or reject the main and secondary hypotheses, the researcher engaged in wide-ranging analyses to carefully examine the data and provide the necessary empirical support.

The examination of pretest and posttest findings provides useful information about the effectiveness of this instructional method and its implications for the three writing components. Throughout the course of the study, participants completed a series of writing tasks both before and after receiving the posttest and the pretest, respectively. The results of the pretest and posttest assessments were reviewed, analysed, and compared not only to illustrate the statistical significance of changes noted in various scores but also to draw evidence-based conclusions about the usefulness of the concept mapping strategy for writing performance. For ease of reference and presentation, all obtained scores and subscores were compiled and illustrated in

statistical tables, diagrams, or both. To elucidate the method of final pretest and posttest score calculation, thorough breakdowns of all sub-scores are essentially elaborated and presented.

In more detail, among the key patterns depicted and outlined within the tables are the pretest and posttest scores assigned by both raters for content, organisation, and mechanics; the average values for content, organisation, and mechanics in the pretest and posttest; and the final pretest and posttest scores. Preliminarily, according to the results demonstrated in the table and bar chart showing the pretest and posttest overall writing performance scores, there is a noticeable increase in and a distinct elevation with regard to the overall writing scores, with the posttest scores exhibiting remarkably higher marks.

To further validate and solidify this finding, and for the accurate detection of any potential disparities between the overall pretest and posttest scores, more detailed and specified statistical measures and analyses were carried out. This course of action particularly incorporates descriptive statistics, inferential statistics, and effect size. To make it explicit, the researcher progresses by following a structured sequence of steps, initiating with the calculation of descriptive statistics, inferential statistics, and effect size for the overall writing performance and culminating in the computation of descriptive statistics, inferential statistics, and effect size for the performance in content, organisation, and mechanics.

To obtain a fundamental knowledge of how the two pretest and posttest datasets differ in terms of central tendencies, mean comparison and mean difference, which are common statistical metrics, were calculated. To explain, the mean difference reveals how much the two datasets' averages differ from one another. The posttest mean surpasses the pretest mean. Besides, the mean difference between the posttest and pretest scores is not a negative number, nor is it close to zero. Instead, it is a positive value, which exceeds zero, indicating that the posttest dataset has higher average values than the pretest dataset. Drawing from both

observations, it is reasonable to assert that the scores obtained in the posttest exceed those attained in the pretest, signalling a better overall writing performance in the posttest.

Hypothesis testing requires going beyond just comparing means or differences between two datasets. Typically, it involves considering choosing an appropriate statistical test among a diverse array of several available options. The most essential factors that drive the selection of the test include the research question and purpose, data distribution, variable types, and the number of groups in the study. An important consideration prior to deciding on the type of statistical test is the examination of whether the collected data adheres to a normal distribution. In this study, the data's normality was fundamentally assessed visually and statistically using three key approaches: (1) skewness and kurtosis z-values, (2) the Shapiro-Wilk test, and (3) visual diagrams. Pertaining to this, it was verified that the data do not differ from the normal distribution pattern, thereby seeking parametric types of tests.

In accordance with all the parameters, the paired samples t-test, which aspires to ascertain whether the concept mapping posttest scores are significantly higher than the pretest scores, was run. With reference to the statistical observations, analysis, and findings, and on the basis of the comparison between the derived t-value and the corresponding critical value, it is discerned that the t-value is greater than the critical value. That is, the difference between the pretest and posttest scores and the difference between the means are statistically significant. This implies that the observed changes in writing performance scores between the two treatment points (pretest and posttest) are more likely due to the implementation of concept mapping than to random variability or chance. Accordingly, the findings support the notion that concept mapping has a practical impact on improving overall writing performance, thereby rejecting the null hypothesis in favor of the alternative. These findings align with the conclusions reached at by Al-Shaer (2014), Lee (2013), Negari (2011), Nobahar et al. (2013), Rahman & Ambreen (2018), and Wan Azlinda & Badrul (2008).

Since all statistical tests only offer knowledge on statistical significance and communicate whether or not an impact is attributable to chance, another pivotal action is imperative to disclose the intervention's effect size. The latter, which is a standardised measure that evaluates the magnitude of mean differences and the size of the effect, can be achieved through calculating Cohen's *d*. It is crucial to recognise that the attained *d* value is greater than 0.8, conveying a substantial impact size. This indicates that the difference between the overall pretest and posttest writing scores is high, implying that the treatment had a large and significant positive influence on students' writing ability.

Descriptive statistics present evidence for the notable increase in both the mean content score and the mean organisation value from the pretest to the posttest, communicating an enhancement and amelioration in content and organisation quality. The component of mechanics, however, took a divergent turn in the posttest, with a noticeable decline in the mean score from the pretest to the posttest, pointing towards a deficiency in improving writing mechanics. Inferential statistics were subsequently computed to examine the statistically significant differences between the pretest and posttest scores with regard to content, organisation, and mechanics. The paired samples *t*-test was adopted as long as all datasets systematically followed and adhered to a normal distribution pattern.

Unlike mechanics, where the *t*-value is smaller than the critical value, both content and organisation yield *t*-values that are greater than the critical value, as determined by the results generated through SPSS. These findings bring to light the real existence of a statistically significant difference between pretest and posttest scores only for content and organisation. Drawing from such observations, the intervention had a strong favorable effect solely on content and organisation, but not on mechanics.

Substantially, this provides support for rejecting the subsidiary content and organisation null hypotheses, while maintaining acceptance of the mechanics null hypothesis. This serves as evidence for confirming that the implementation of such a tool during the pre-writing stage may promote the writing performance of third year students of English at Biskra University in terms of content and organisation only. Chiefly, informed by Cohen's *d* value, the effect size for content and organisation has been proven to be significantly considerable and high, showing a significant difference between the pretest and posttest scores, and a strong effect from the treatment on the aspect of content and organisation.

RQ4: What are the attitudes of third year students of English at Biskra University towards the use of concept mapping in the planning stage of the writing process?

Awareness of the attitudes and opinions that arise following the application of a new strategy or method is critical. Specifically, by means of a student interview, this awareness acts as a diagnostic instrument for ascertaining the strengths and weaknesses of the applied approach and establishing how effective the intervention is in achieving its goals and objectives. Positive attitudes well indicate the interviewees' preferences for and active involvement in the learning experience, which aligns with their needs and interests. In cases of confusion, dissatisfaction, or a lack of relevance, negative attitudes may likely be captured.

In the context of this study, and to answer the fourth research question, the formulated hypothesis posits that third year students of English at Biskra University may have positive attitudes vis-à-vis the implementation of concept mapping in the planning stage of the writing process. It is worth mentioning that after the completeness of the treatment, four respondents were interviewed in order to explicitly examine their opinions toward the usage of concept mapping in the pre-writing stage. This was established by offering varied, informative participants' answers and a well-formed synthesis of these responses. Being acknowledged as one of the foremost qualitative data analysis methods, thematic analysis has so far been

employed, incorporating the essential stages of familiarisation, generating codes, generating themes, reviewing themes, defining themes, and writing the findings. To consistently code the transcripts and assign labelling patterns, the MAXQDA software program was adopted. It provides tools for systematically exploring, visualising, organising, coding, categorising, and analysing segments of text.

The interview illuminates and helps gain invaluable insights not only into students' experiences and attitudes but also into the improved writing elements, challenges in implementing concept mapping, and solutions to address these problems. This understanding also informs us about the concept mapping's potential applications, positive attributes, and deficiencies, thereby suggesting potential alternative solutions and adjustments for improving and refining its utilisation. Before manifesting and delving into students' attitudes toward the usage of concept mapping in the pre-writing stage, it is imperative to go through and review all the pertinent findings derived from the interview questions.

Writing was thought of as a laborious practice, yet upon the integration of concept mapping during the planning phase of writing, it was looked upon as an easy and manageable experience. This transition in viewpoints implies that the application of concept mapping in the initial phase of the writing process fosters students' writing experience and works on alleviating some of the hindrances linked to the practice of producing text. It is possible to deduce, then, at least at this point, that the newfound standpoint reflects a positive attitude towards the use of concept mapping as a pre-writing strategy. Therefore, this is a good indication that the students will potentially approach the writing task with greater confidence, motivation, and sense of capacity. Scrutinising the specificities of varied student responses shared during the interview majorly brings to light an important trend, manifesting that content, syntax, mechanics, writing stages, organisation, purpose, and topic are the specific writing

components bolstered and advanced by the strategic implementation of the tool under consideration.

Concept mapping markedly serves as a powerful means adept at improving the quality of content in writing. It often entails arranging a set of concepts and sub-concepts visually, which allow one to see and identify connections that may not be visible in linear formats, thereby generating a wide range of thoughts, expanding existing ideas, and creating new content. This brings us to pinpointing gaps in knowledge, which is a critical facet of content creation. A thorough review and scrutiny of the generated concept maps helps writers find out how detailed and complex the map is in terms of the depth of understanding the topic for writing. A well-constructed concept map involves a sufficient and adequate number of concepts and well-placed links with complete propositions.

This creates a good framework for fully-developed and comprehensive main ideas, supporting details, and examples, without forgetting to add necessary information. Within the realm of content, and since its creation is flexible in generating unique and diverse ideas, the concept map was additionally confirmed to stimulate the emergence and generation of innovative and differentiated ideas. Evidently, this marks that this tool helps writers approach the text with a sense of originality, diversion, organisation, clarity, coherence, conciseness, and purposefulness.

Concept mapping also brings about favorable outcomes in respect of syntax in writing. To explain further, it allows writers to identify and visualise how the main topic and its subideas are hierarchically organised and placed within the constructed map. This clarity allows them to gain a better understanding of how the ideas can be correspondingly translated and turned into complete and well-crafted topic sentence and supporting sentences, how these expressions connect to each other, and how such sentences can be logically ordered and integrated inside

paragraphs. This makes it possible to develop carefully constructed sentences with improved syntactic structures.

The detailed exploration of students' responses gives context to the efficacy of concept mapping in upholding a focus on the topic and purpose of writing. Since it encourages relevance, coherence, and unity, an effective and well-constructed concept map provides key information that revolves around a specific and well-determined writing topic and purpose. The writer's understanding of a subject can be visually represented and showcased by usually positioning the major theme or concept at the top of the map, with the sub-ideas at the bottom. This centered approach establishes that all the different ideas and details, within the map, are interconnected and connect to the overall concept or theme, directing the writer to remain concentrated on and attentive to the central theme and broader aim of the piece throughout all the writing stages. If the writer refers to the developed concept map on a regular basis when creating and drafting the content of the text, the map will usually function as a point of reference to constantly remind him/her of the key topic and supporting details. This reduces the possibility of deviating from the intended topic and purpose.

A further advantage of the concept map on writing, in conformity with the results of the interview, is that it excels in its ability to boost sentence arrangement and paragraph organisational structure. It can substantially assist in organising paragraph writing by promoting idea generation and content structuring. This tool facilitates the generation of pertinent concepts, shows the relationships between them, and arranges them logically and hierarchically. The map results in the fundamental content that is required to write a text and arrange paragraphs.

Accounting for the writer's writing intention(s) and the subjective approach to structuring the chart, different branches, sub-branches, and concepts tend to portray and express paragraphs, sections, supporting sentences, or details. This is best used to illustrate different writing patterns, such as the chronological sequence of events, compare and contrast, and cause-and-effect. By means of its hierarchical tree structure, the map guides the logical arrangement of sentences and paragraphs in the piece of writing. The good identification, generation, and location of the main and sub-ideas within the concept map help maintain an adequate text structure and appropriate content organisation. This can be better achieved by ordering and positioning the topic sentence, supporting sentences, and concluding sentence in the right place within the paragraph.

As for the writing phases, concept mapping establishes a structured framework for guiding the writing stages by systematically assisting student writers in planning, drafting, and revising their work. In addition to assistance with idea generation, concept mapping can also act as a writing instrument that walks the writer through every step of the writing process, from planning to revision. To compose a coherent and high-quality paragraph, and prior to writing the initial draft, student writers can simply generate different thoughts and arrange them hierarchically, with the main ideas, subtopics, and supporting details. They place possible relevant thoughts they have on the subject on the map and see how they relate graphically.

The writer may begin creating and drafting the content by referring to every node and link on the map. This is because each node on the map denotes and stands for an argument, example, paragraph, or section of the text. Furthermore, the links determine the kind of relationship between varied paragraph components. The connections displayed on the concept map help decide the sequence of ideas' presentation in the draft. They can be used to establish natural and logical transition points between different ideas or paragraphs and to make sure that

every section or pattern makes sense in relation to the one before it. Similarly, the relationships between the concepts in the map specify different transition points between sentences or paragraphs in writing. Such a visual representation also helps the writer to check the paragraphs' organisational pattern, logical flow of ideas, relevancy of thoughts, repetitions, and irrelevancies. It is reasonable to conclude, therefore, that the draft's general arrangement is dictated by the concept map's structure and hierarchy.

In reference to the connection between concept mapping and writing mechanics, there is limited empirical evidence that explicitly uses concept mapping to a better improvement in writing mechanics. This particular influence on writing mechanics has not been thoroughly investigated on its own. Concept mapping may indirectly aid in strengthening some aspects of writing mechanics by raising consciousness about and awareness of the irrelevancies, errors, and appropriate usage of patterns in punctuation, capitalisation, layout, and spelling. This could be attributed to its supportive role in instigating writers to express their thoughts concisely, providing a more logical and hierarchical organisation and structure for the content in the text.

Within the framework of this research, in contrast to the discernible improvement observed in content and organisation competencies, writing mechanics remain largely unaffected by the application of concept mapping in the pre-writing stage. In other words, there isn't a noticeable and noteworthy improvement in the component of writing mechanics following the utilisation of concept mapping in the pre-writing stage. The tool does not appear to contribute to an observed advancement in writing mechanics because it has a limited focus on writing. The primary emphasis of concept mapping is geared towards generating content, arranging ideas, and structuring thoughts. It lacks functionality for addressing the graphic rules, technicalities, and conventions that make language readable. Laying a foundation for and gaining knowledge in the mechanics of writing frequently calls for specialised instruction,

practice, and feedback. These findings were confirmed and corroborated by the interview-derived analysis and conclusions, stating that the tool has a strong favorable effect solely on content and organisation.

The data in this study, derived from quantitative and qualitative analysis techniques, showcase that concept mapping specifically addresses content and organisation in writing, accentuating its applicability and versatility in clarifying concepts and relationships. The practicality of and preference for this tool is also reflected in the interviewees' interest, commitment, and engagement in the study sessions. Importantly, the engaging nature of concept mapping captures their genuine enthusiasm to willingly try out the tool and actively participate in discussions or tasks. After examining and comparing their answers, and to solidify these observations, it becomes clear that the interviewees found the use of the concept mapping pre-writing strategy productive and stimulating. Building on the preceding information, we can affirm the formulated hypothesis, endorsing that third year students of English at Biskra University elicit an especially favorable stance and positive attitudes towards the use of concept mapping in the planning stage of the writing process.

5.2 Pedagogical Recommendations and Implications

The practical application of concept mapping is apparent in the analysed data and evidenced by the obtained results. Its efficacy and potential, demonstrated in earlier sections, particularly reveal favorable outcomes in relation to writing content and organisation. The preference for this visual organiser is also reflected in the interviewees' interest, enthusiasm, and positive attitude. Realising the strengths and weaknesses of the investigated concept map provides a framework for ultimately improving its strategic use and making informed decisions on optimising its utilisation. Based on the overall study results, and in order for it to be efficiently employed for teaching and learning purposes, the use of the concept mapping approach can be guided by the following list of recommendations and guidelines:

5.2.1 Recommendations for Teachers

- Instructors should introduce their students to a range of pre-, during, and post-writing strategies so that they can choose the one that best suits them.
- Instructors need to be cognizant of the various factors that could influence students' ability to produce effective and well-structured written materials.
- Prior to adopting and putting the concept mapping strategy into practice, teachers need to fully comprehend it by gaining profound knowledge about its potential attributes and properties. This potentially comprises as varied facets as its types, theoretical background, components, creation steps, scoring rubric, applications, and factors affecting its effectiveness.
- An in-depth plan outlining the introduction and incorporation of the new strategy needs to be designed, considering how the tool coincides with the teaching methodology, educational objectives, curriculum goals, and learning outcomes.
- To maintain focus, educators need to ensure that the targets for the new plan are well clarified and firmly established.
- To achieve a comprehensive theoretical and practical grasp of the concept mapping approach, teachers and students should engage not only in reading and researching but also in skill-building sessions, in-service training, educational workshops, tutorials, workshops, and seminars.
- Since the vast majority of students are not accustomed to the intricacies of concept mapping, it is particularly useful to introduce it to them gradually and systematically, following a step-by-step approach. That is to say, the teachers should start by succinctly and simply outlining the fundamentals or tenets of the new strategy. They should concentrate on supplying a concise description of the main

concepts and goals underlying the approach before they progressively increase the number and complexity of the tasks. This organised and supported way enables students to expand on their existing skills and abilities.

- Teachers should better start with simple and familiar topics that students already grasp. This may pertain to an already studied subject or a theme that resonates with their inclinations and preferences.
- The careful reviewing and examination of students' created concept maps is vital for indicating their state of knowledge, misconceptions, gaps in knowledge, misunderstandings, and concept mistakes.
- Teachers should seek diversification in their selection of writing activities and text types in order to bring to light the fact that the concept mapping strategy works well for varied text types with varied levels of difficulty.
- Upon implementing concept mapping, conducting continuous assessments and ongoing evaluations is crucial to regularly check student performance for any emerging changes, trends, or patterns. This is specifically important to monitor and track student development, examine learning outcomes, and pinpoint problem areas, thereby making well-informed adjustments and providing necessary support and guidance. This could entail evaluating their performance according to preset standards or according to a predefined scoring rubric.
- To build a strong foundation of concept mapping and gain a better familiarity with its components and applications, it is important to expose students to concept mapping earlier in education. Early exposure to such a strategy provides more opportunities for learning, practicing, and mastering its basic skills.

- Since concept mapping is a visual tool for generating thoughts and displaying information graphically, teachers can use it with students of varying skill levels and understandings, including anyone from beginners, with basic understanding of a subject, to advanced learners, developing specialised knowledge in a particular subject.
- For teaching purposes, concept mapping offers utility in content knowledge organisation, course content delivery, project-based learning, data analysis, curriculum and lesson planning, project management, cross-curricular connections, assessment, and evaluation.
- Concept mapping promotes active learning; it can be used not only as an individual learning activity but also in pairs, as a small group task, or as a class-wide activity.
- Before providing targeted writing guidance, which may be in the form of lessons, tasks, feedback, or introduction to writing strategies, teachers need to preliminarily identify students' current writing levels and diagnose their existing writing difficulties. To exemplify, various struggles with vocabulary, sentence construction, basic grammar rules, idea generation, prior knowledge, or argumentation call for different approaches and demand tailored solutions or specified courses of action.
- Concept mapping is flexible in its structure and use. In view of this, it can be personalised and adapted to conform to and accommodate varied and clearly outlined factors, including objectives, preferences, topic's nature and complexity, and the size of the classroom.

- Making the map visually appealing requires careful consideration of the diversity and distinctiveness of elements like colors, shapes, images, symbols, and links during the creation process. A map's design and layout have a significant impact on how well it captures and holds the user's attention, promotes its content, clarifies its structure, and increases its memorability.
- Teachers should be committed to using and incorporating concept mapping not only into writing projects but also into other courses, future endeavors, and practices.
- Since it is a versatile tool for visually representing knowledge, concept mapping can be transdisciplinary and applicable to a wide range of domains and subjects; therefore, instructors have the option to utilise it in a variety of disciplines.

5.2.2 Recommendations for Students

- In order to foster collaborative learning and abilities, students can typically collaborate to combine several individual concept maps that they have generated earlier.
- In order to assist themselves in creating their concept maps, students should rely on their own initiative and research any applicable rules, guidelines, or templates.
- Students should essentially be aware that concept mapping is not designed for the mere task of compiling a list of thoughts. It serves the purpose of identifying ideas and illustrating how they relate to each other and to the overall theme. Establishing connections is extensively emphasised.

- Students can compare their maps to an expert concept map, which can offer a basis for determining their understanding of a topic. Relevant and valid concepts and relationships can be a good indication of a high level of knowledge and understanding. The lack of sophistication or absence of appropriate and valid concepts, linkages, or hierarchies is evidence of a lack of understanding and limited internalised information.
- As with any skill, regular practice is required for gaining proficiency in and becoming adept at producing and constructing concept mapping.
- Increase students' awareness of and assistance in understanding how the idea mapping approach can function as a guide for text production and be useful throughout the pre-writing phase of the writing process.
- The process of creating concept maps during the pre-writing stage may initially seem difficult and time-consuming. With regular practice, the student will be able to generate the various components of the map, explain bodies of knowledge, and create pertinent linkages between concepts with less time and effort.
- Students should realise that the process of concept mapping is iterative and never finished. As knowledge expands, to reflect a better understanding of the topic, the concept mapping needs to be constantly revised and updated. For the most part, some concepts can be added, moved around, or even taken away.
- For effective computer-generated concept maps. Students can make use of varied programs and platforms such as Cmap Tools, Freemind, Mindmup, Mindomo, Inspiration, and Bubbl.us. Such computer-assisted tools work on facilitating and supporting concept map construction, revision, and modification.

- A concept map should not be overloaded and text-heavy, comprising lengthy expressions and text blocks. For a better visual influence, an effective concept map should contain succinct and concise words and descriptions of the key concepts and ideas.
- Concept mapping can be evidence-based. To support the integrated ideas, evidence, statistics, examples, or quotes can be incorporated.
- Before proceeding to the writing stage, the student needs to thoroughly examine and go over the generated concept map. This is to verify that it appropriately conveys the main ideas, connections, and examples that will be correspondingly translated and turned into a complete and well-crafted topic sentence, supporting sentences, and concluding sentence. Working as a roadmap for writing, the map should be regularly consulted while drafting the text or paper to maintain structure and uphold coherence and focus.
- Seeking feedback from instructors or peers on the generated concept map is fundamental for providing insights or suggestions that can improve and refine both the map and the writing.
- Improving the writing skills and overcoming the difficulties can also be typically achievable when students become more independent and self-reliant, thereby actively seeking further practice opportunities.
- Since concept mapping may lack functionality for addressing the graphic rules, technicalities, and conventions, the students may lay a foundation for and gain knowledge in the mechanics of writing by seeking specialised instruction, practice, and feedback.
- A concept map without a basic understanding of the subject may yield inaccuracies or omissions. With unexplored or unfamiliar subjects, the student can establish a foundational understanding and exploration of the writing topic by reading relevant

materials such as scholarly articles, textbooks, and online resources, or by engaging in discussions, attending lectures, and watching instructional videos.

- The concept mapping usage is not confined to the pre-writing stage or tasks. In essence, it can be incorporated into a study routine as it permeates and applies to a myriad of activities. Instances of these are brainstorming and idea generation, prior knowledge activation, note-taking, strategic planning, reading comprehension, listening comprehension, speaking performance, knowledge organisation, problem-solving, exam revision, memory enhancement, strategic learning, planning studies, and term projects.

5.3 Limitations of the Study

All research projects have some limitations that might be predictable or occur unexpectedly while executing the study. At the simplest level, the research limitations are weaknesses of the study that are often outside the researcher's control. They reflect the shortcomings of an investigation based on theoretical and practical constraints that the researcher faced. Although Such factors are viewed as weaknesses affecting the results of the study and threatening its internal and external validity, they are usually viewed beneficial in building the framework for and setting the foundation for future research. There are many possible limitations to a study. These may include factors like limited access to the study participants, time constraints, funding constraints, equipment, data access, and participant drop-out.

There are probably two major limitations, within the framework of the current investigation, that have established considerable obstacles for the researcher. One revolves around the restricted access to some study participants. The researcher, who was in charge of the writing course, noticed inconsistent and irregular student attendance in teaching sessions and classroom gatherings. Despite the researcher's effort in maintaining scheduled classroom

sessions, some students were not consistently present during the regular writing study sessions, thereby typically missing out on key lessons, content, explanations, discussions, and activities. This may result in incomplete knowledge of and gaps in understanding the specificities and components of the learned concept maps, thereby affecting the reliability and validity of the obtained writing performance scores in the two main treatment points (pretest and posttest).

To avoid incomplete data and errors in measurement that may result from the effect of this limitation, additional makeup sessions were frequently scheduled for absentee students, ensuring they could catch up on missed content. This likely leads to meaningful interpretations and conclusions with regard to the effectiveness of the intervention. The second constraint faced by the researcher was the limited access to and availability of some technological tools and visual aids in the educational institution. Such instruments, as data projectors and computers (computer laboratories), may work on fostering the learning experience and communication. They also help to convey complex information visually with relative ease.

In such a study, these tools particularly play a crucial role in demonstrating the map-making process with corresponding examples, collaboratively discussing specific concept map samples, and presenting student-created maps to the remaining students. A minority of students had the privilege of constructing computer-generated concept maps as they had access to personal devices, while the rest missed the opportunity of creating computerised- concept maps, being only concerned with hand-drawn maps.

5.4 Suggestions for Future Research

Since the current investigation was carried out within a constrained duration and a short time limit, future concept mapping projects and endeavors can be conducted over a prolonged period of time, in the context of longitudinal studies. Undertaking a research study over an extended timeframe can better help researchers observe the phenomenon and its long-term impact, as well as track the participants' sustained progress for any changes. Based on the results obtained so far in the study, and in light of the study constraints, forthcoming studies can be carried out on a large-scale or scope, typically at the level of sample size, population, or setting.

In academic contexts, and to pursue and seek out comparative studies, researchers may choose to analyse and discuss the efficacy of concept mapping against further pre-writing strategies such as free writing, brainstorming, questioning, and researching. It is important to note that researchers may also have the option to compare the applicability of concept mapping across a wide range of age groups, educational institutions, cultural contexts, and developmental stages. An example of such investigations may be a study investigating the usefulness of concept mapping on writing outcomes for both middle and high school students.

Given that the present research work explores the impact of implementing the concept mapping pre-writing strategy on writing performance with regard to content, organisation, and mechanics, future investigations and research projects could narrow their focus to investigate how concept mapping influences a singular component or dimension of writing performance. That is, they might concentrate more specifically on a targeted component skill of quality writing such as content, vocabulary, organisation, language use, or mechanics. As they might also shift attention to exploring and probing the relationship between concept mapping and a number of different areas as varied as speaking, listening, reading comprehension, meaningful

learning, achievement, curriculum and lesson planning, assessment and evaluation, note-taking, and conducting research.

Conclusion

The present chapter highlighted and synthesised the primary results and key research outcomes derived from the research objectives and questions. It sought to decipher the most typical writing challenges, establish the major causes of these difficulties, investigate the usability of concept mapping for improving writing performance, and pinpoint student attitudes that originate from its adoption. This entailed evaluating and combining various qualitative data and quantitative measures gathered during the study procedure. This chapter also offered practical guidance and pragmatic advice tailored to teachers and students in order to support and direct the systematic application of concept mapping in teaching and learning. The chapter concluded with a list of recommendations and suggestions for further study investigations and projects.

General Conclusion

Writing is a rudimentary skill that underpins knowledge preservation and transmission in personal or professional contexts, with particular applicability to the field of education. It holds elevated importance in language learning contexts, for it is essential to the growth of linguistic abilities, establishing foundational skills for vocabulary expansion, grammatical proficiency, and communication skills. Since writing is typically a means to showcase the understanding and grasp of complex themes and content knowledge, multiple education institutions highly focus on the substantial evaluation of students through their written productions. This is because it is widely acknowledged that academic success can be discerned by writing proficiency and performance.

Despite its widespread importance, too often, the complicated and multidimensional nature of writing makes the activity of producing a written piece an unpleasant experience for both native and non-native writers. This typically germinates from the fact that writing is not a mere effort to produce text with a specific, consistent style, complex grammatical structures, varied vocabulary, and strong argumentation. In fact, writing is not a one-component skill; it is the end result of interaction among a collection of distinct and interrelated sub-skills, components, and stages, all of which contribute to the production of informative, accurate, coherent, and organised written work.

A more sophisticated view of writing perceives it as an intentional, complex, and multifaceted cognitive activity that requires specific higher-order thinking processes and a huge mental task. Effective writing is more than a personal activity of asserting individual's feelings, thoughts, and opinions. It is a means of communication through which the ideas, information, messages, and meaning of the text can be shared and disseminated to fit the interests of a given targeted audience and to realise and fulfil a specific aim. Therefore, writing is not only a self-

expression endeavor but also a social task that draws attention to the issues of audience awareness and purposefulness.

Central to this view is the employment of specific writing strategies and techniques that support structuring information, idea generation, drafting, reviewing, revising, or editing. Key to the act of writing is the adoption of relevant pre-writing strategies that establish a solid foundation for exploring, generating, organising, and clarifying thoughts. Such tools work on mitigating students' writing struggles and guiding them along the way to produce a good finished work. Despite this significance, the use of pre-writing strategies is not prevalent among students, as some are not strategic in their writing while others do not have the willingness for applying writing strategies.

Reflecting on the current research project, and in light of the researcher's active observation and thoughtful expert-based discussion, the research problem came into consideration. Noticeably, the majority of third year students at Biskra University were unable to convey their thoughts in a clear and cohesive manner, leading to uncertainty or confusion in their writing. Addedly, their writing behaviour is poor, indicating frequent and potential writing struggles. This particular issue was suggestive of the need for employing more impactful and efficient approaches and methodologies to support students improve their writing performance and reduce their difficulties.

In view of this, the present study suggested the utilisation of Novakian concept mapping as an active pre-writing strategy to potentially assist students in fostering writing abilities, writing masterfully, and maintaining the logical progression of ideas. Since writing is of a multicomponent nature, the focus of the study was specifically directed towards the well-determined writing sub-skills of content, organisation, and mechanics. In this respect, and drawing on the study's well-defined aims, the researcher aspired to examine the practicality of concept mapping on students' writing performance in terms of content, organisation, and

mechanics, as well as identify their attitudes toward its implementation in the pre-writing stage of the writing process. Another target was the endeavor to explore the basic obstacles faced by students while immersed in the writing task, along with the factors underlying those struggles.

From this perspective, four research questions guided this investigation. To establish the foundation for the study's research methodology, a detailed specification and determination of multiple methodological elements, complemented by the rationale for each selection, were elucidated. Guided by the study's nature and objectives, the present inquiry was structured to intermix the quantitative stance with the qualitative perspective; therefore, it worked under a pragmatic orientation, which typically adopted a Mixed-methods approach.

Relating to this, an embedded mixed-methods research design, in which the qualitative data can help explain or interpret the quantitative findings, was well-suited and more appropriate to answer the research questions. This design, then, provided a more complete picture of the effect of concept mapping on writing performance and the way the participants experience the intervention. Since the study sought a mixture of approaches in one single inquiry, it practically incorporated quantitative and qualitative data collection methods, with a student pre-treatment questionnaire, a teacher questionnaire, a pretest and posttest, and a student post-treatment interview being adopted. To analyse and add meaning to the set of collected data initially gathered from 31 third year students of English at Biskra University and from 10 teachers of the written expression course, a combination of objective, numerical measurements and textual, non-numerical data was pursued. In this connection, statistical analysis, using descriptive and inferential statistics, and qualitative analysis, embracing thematic analysis were sought.

Within the framework of the current investigation, and by means of interpreting the results of the student pre-treatment questionnaire, the underlying primary challenges and perplexities experienced by third year students of English at Biskra University throughout or while they are engaged in the writing task are varied and concern any of the writing process phases. Essentially, such obstacles are not only confined to basic limitations in grammar usage, sentence structure, punctuation, and vocabulary. Instead, they transgress into notable troubles in connection with word choice, idea scarcity and organisation, and prior knowledge activation. Clearly put, students' writing difficulties comprise a notable lack of ideas about the writing topic or theme, complexity in organising and connecting ideas logically, inaccuracy in word choice, incorrect use of writing mechanics, inappropriate sentence formation and presentation, and difficulty with prior knowledge activation.

The teacher questionnaire supplied useful information on the most frequently occurring causes and determinants of writing difficulties among third year students of English at Biskra University. It fundamentally communicated that the variety of underlying factors contributing to writing troubles are not exclusively the result of a lack of effort in writing. On top of that, they can additionally stem from and emerge from the neglect of effective writing strategies, the disrespect of the writing stages, a lack of opportunities for practicing writing, limited reading opportunities, writing under time constraints, having poor background knowledge, and a lack of language competence.

Given the pretest and posttest findings, the application of statistical analysis and measures provided useful information about and helped draw evidence-based conclusions regarding the practical effect of integrating concept mapping as a pre-writing strategy on the writing performance of third year students of English at Biskra University in terms of content, organisation, and mechanics. The findings presented evidence for the notable statistical increase and distinct elevation in the overall writing scores, content scores, and organisation

scores, with the posttest scores exhibiting remarkably higher marks. No improvement was captured with regard to writing mechanics. In essence, the intervention had a strong favorable effect solely on the writing content and organisation, but not on mechanics. This served as evidence for confirming that the implementation of such a tool during the pre-writing stage enhances and ameliorates the writing performance of third year students of English at Biskra University in terms of content and organisation only.

A profound exploration of the attitudes of third year students of English at Biskra University towards the use of concept mapping in the planning stage of the writing process was established by means of a student interview through the interpretation of varied participants' answers and the provision of a well-formed synthesis of these responses. The interview illuminated and helped gain invaluable insights not only into students' experiences and attitudes but also into the improved writing elements, challenges in implementing concept mapping, and solutions to address these problems. This understanding also informed us about the concept mapping's potential applications, positive attributes, and deficiencies, thereby suggesting potential alternative solutions and adjustments for improving and refining its utilisation. It was determined that the interviewees found the use of the concept mapping pre-writing strategy productive and stimulating, eliciting an especially favorable stance and positive attitudes towards the use of concept mapping in the planning stage of the writing process.

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Appendices

Appendix 1: Participant Informed Consent

Informed Consent

Dear Participant,

I am conducting a research study in which you are kindly asked to participate in. Aiming to help you take a decision on what concerns your participation, this letter attempts to briefly explain what the study is about, the tasks you are required to do, and the rights you have as a research participant.

This study is entitled “The Incorporation of Concept Mapping as a Pre-Writing Strategy to Improve English as a Foreign Language Learners' Writing Performance”. Precisely, and based on the research purpose and aims, I will be carrying a treatment aiming to examine the efficacy of the aforementioned strategy on the writing performance of third year students.

In this respect, you are invited to take part in this research which will be conducted over twelve one-hour class sessions (including the pretest & posttest sessions). In addition, and to provide more details and evidence on the studied strategy, questionnaires will be administered.

Essentially, your anonymity, privacy, and identity will be protected. Your participation in this research is entirely voluntary. Your consent can be withdrawn at any time.

If you accept to participate in this study, please sign the attached consent form. Your cooperation will be highly appreciated.

For further questions regarding this research project, you are welcome to contact the researcher.

Yours sincerely,

Researcher Contact Details:

Meriem Henouda

Email: henoudameriem9@gmail.com

Mohamed Khider University of Biskra

Faculty of Letters and Languages

Department of Language and English Literature

I have read and clearly understood the researcher's request. I consent to volunteering as a participant in the research project being undertaken by Meriem Henouda

Name:.....

E-mail:.....

Telephone Number:.....

University:.....

Department:.....

Date:.....

Appendix 2: Consent Letter for the Head of the Department of English**Consent Letter for the Head of the Department of English****Informed Consent**

Dear Head of the English Department,

At present, I am conducting a research study examining the effects of using the concept mapping strategy on learners' writing performance.

Therefore, I am looking for your consent to conduct an interview with some third year students.

Essentially, anonymity, privacy, identity, and data gathered throughout the process of conducting this research will be protected.

I highly appreciate your permission and help.

For further questions, you are welcome to contact the researcher.

Yours sincerely,

Researcher Contact Details:

Meriem Henouda

Email: henoudameriem9@gmail.com

Mohamed Khider University of Biskra

Faculty of Letters and Languages

Department of English and Literature

I have read and clearly understood the researcher's request. I consent to the participation of third year students at the section of English in the research project being undertaken by Meriem Henouda.

Name:.....

E-mail:.....

University:.....

Department:.....

Date:.....

Signature:



The image shows a handwritten signature in black ink over a red circular stamp. The stamp contains Arabic text: 'جامعة أسيوط' (Assiut University) at the top, 'قسم اللغة والأدب الإنجليزي' (Department of English Language and Literature) on the left, and 'كلية الآداب واللغات' (Faculty of Education) at the bottom. The signature is written across the stamp.

Appendix 3: Opinionnaire

OPINIONNAIRE

1- Are there any repetitive questions?

Yes

No

- If yes, please specify them.

.....
.....
.....

2- Did you find any grammar/spelling mistakes in the questions?

Yes

No

-If yes, please notify them below.

.....
.....
.....

3- Are there any irrelevant questions that need to be removed?

Yes

No

-If yes, please provide the number of the question(s) below.

.....
.....
.....
.....

4- Is the questionnaire of reasonable length?

Yes

No

5- Are there any ambiguous questions that need to be reformulated and / or clarified?

Yes

No

-If yes, please indicate which questions require rewording.

.....
.....
.....

6- What do you think of the layout?

.....
.....
.....

7- Are the response categories appropriate?

Yes

No

8- If there are any questions that you believe are of close relevance to the purpose of the questionnaire but were not included, please write them below.

.....
.....
.....

Thank you very much for your time and collaboration

Appendix 4: Questionnaire Validation Form

Questionnaire Validation Form

I hereby certify that I have read the students' questionnaire in the study carried out by Meriem HENOUDA who is presently working on her PhD thesis at Biskra University. I have provided the researcher of this study regarding the incorporation of concept mapping as a pre-writing strategy to improve English as a foreign language learners' writing performance with remarks and comments concerning the layout, as well as the contents of the questionnaire.

Background Information on the Expert:

Name:.....

University:.....

Present Occupation:.....

Degree:.....

Telephone Number:.....

Email Address:.....

Signed:.....

Researcher Contact Details:

Meriem Henouda

Email: henoudameriem9@gmail.com

Mohamed Khider University of Biskra

Faculty of Letters and Languages

Department of Language and English Literature

Appendix 5: The Pre-treatment Questionnaire for Students

Dear Volunteer Participant,

You are kindly requested to respond to the following questionnaire, which serves as a data collection method for a study, entitled “The Incorporation of Concept Mapping as a Pre-Writing Strategy to Improve English as a Foreign Language Learners' Writing Performance”. As for the general aim, the current investigation is an endeavor to foster the writing performance of third year students of English at Biskra University through the use of concept mapping during the pre-writing stage.

Your responses/ data will be anonymous and will be used for research purposes only. Please tick (✓) the appropriate box and give full statements whenever necessary.

Prepared by:

Meriem HENOUDA

Supervised by:

Pr. Ahmed Chaouki HOADJLI

Academic Year: 2023-2024

Section One: General Information

Q1. Would you specify your gender:

- a) Male
- b) Female

Q2. Which language skill do you find most challenging?

- a) Listening
- b) Speaking
- c) Reading
- d) Writing

please justify

.....

.....

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.....

Section Two: Writing Performance

Q3. How do you consider the writing skill?

- a) Very important
- b) Important
- c) Not important at all

Q4. Do you enjoy the time you spend writing?

- a) Yes
- b) No

If yes, in which language are you mostly used to write?

- e) Arabic
- f) French
- g) English

Others.....

.....

Q5. How often do you write in English?

- a) Always
- b) Often
- c) Sometimes
- d) Never

Q6. Why do you generally come to write in English?

- a) For pleasure
- b) As part of an assignment
- c) For learning purposes
- d) For communication purposes

Others.....

Q7. Which of the following writing stages do you find most challenging?

- a) The stage of generating, gathering, and organising ideas
- b) The stage of writing the first draft
- c) The stage of revising the content and structure
- d) The stage of editing the mechanics of writing

Q8. Do you have any writing struggles or difficulties?

- a) Yes
- b) No

If yes, please specify them

- a) Difficulty with capitalisation, punctuation, layout, and spelling
- b) Difficulty with word choice
- c) Difficulty with sentence structure
- d) Difficulty organising and connecting ideas in logical sequence
- e) Lack of ideas about the writing topic or theme
- f) Difficulty with prior knowledge activation

Others.....

Q9. How much do you agree that background knowledge has great importance for the quality of your writing?

- a) Strongly agree
- b) Agree
- c) Neutral
- d) Disagree
- e) Strongly disagree

Q10. Once you decide to start writing a passage, and as a way of prior knowledge activation, do you plan out in advance to use a given strategy or technique?

- a) Yes
- b) No

If yes, what do you usually use?

- a) Brainstorming
- b) Freewriting
- c) Questioning
- d) Clustering
- e) Researching
- f) Graphic organisers

Others:.....
.....

Section Three: Concept Mapping

Q11. Are you familiar with the strategy of concept mapping?

- a) Yes
- b) No
- c) I heard about it, but I do not know what it is

In case you are familiar with it, in simple words, please indicate what it is.

.....
.....
.....

Q12. Do you use concept mapping during the pre-writing stage?

- a) Yes
- b) No

Whatever your answer would be, please justify

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.....

.....

Q13. Does any of your instructors use concept mapping in his or her classroom?

- b) Yes
- b) No

If yes, in which module(s) does s/he use it?

.....

.....

.....

Q14. Concept mapping is considered one of the most powerful educational tools to improve writing ability. How excited are you to have the opportunity to use this strategy during the present research study?

- a) Very excited
- b) Excited
- c) Moderate
- d) Not excited

If you would like to add any comments or suggestions, please feel free.

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Thank You Very Much for Your Collaboration

Appendix 6: The Questionnaire for Teachers

Dear Volunteer Participant,

You are kindly requested to respond to the following questionnaire, which serves as a data collection method for a study, entitled “The Incorporation of Concept Mapping as a Pre-Writing Strategy to Improve English as a Foreign Language Learners' Writing Performance”. As for the general aim, the current investigation is an endeavor to foster the writing performance of third year students of English at Biskra University through the use of concept mapping during the pre-writing stage.

Your responses/ data will be anonymous and will be used for research purposes only.

Please tick (✓) the appropriate box and give full statements whenever necessary.

Prepared by:

Meriem HENOUDA

Supervised by:

Pr. Ahmed Chaouki HOADJLI

Academic Year: 2023-2024

Section One: General Information

Q01. Would you specify your gender:

- a) Male b) Female

Q02. Would you specify your degree:

- a) Magister
b) Doctoral
c) Professional

Q03. How long have you been teaching English at university?

.....

Q04. How long have you been teaching writing at university?

.....

Section Two: Teachers' Practice in the Written Expression Course

Q05. How do you find teaching writing?

- a) Easy
b) Challenging
c) Difficult

Whatever your answer would be, please justify

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Q06. Based on your experience, how do you evaluate the English writing proficiency level of the majority of third year students of English at Biskra University?

- a) Elementary
- b) Pre-intermediate
- c) Intermediate
- d) Upper-Intermediate
- e) Advanced
- f) Proficiency

Q07. Do your students encounter any difficulties while engaged in the writing task?

Yes No

If yes, what do you think the major difficulties are?

- a) Difficulty with capitalisation, punctuation, layout, and spelling
- b) Difficulty with word choice
- c) Difficulty with sentence structure and word order
- d) Difficulty organising and connecting ideas in logical sequence
- e) lack of ideas about the writing topic or theme
- f) Difficulty with prior knowledge activation

Others.....

Q08. The main reasons for students' writing difficulties can be attributed to:

(You may choose more than one answer.)

- a) The lack of opportunities for practicing writing
- b) The disuse of effective writing strategies
- c) Having poor background knowledge
- d) Disrespecting the writing stages
- e) Writing under time constraints

Others.....

Q09. What kind of support do you usually give to learners who are low achievers in terms of writing?

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Q10. Do you consider the pre-writing stage important in producing effective written text?

Yes No

Q11. Do you usually introduce your students to certain strategies to be employed during the pre-writing stage?

Yes No

If yes, what kind of strategies?

- a) Brainstorming
- b) Freewriting
- c) Questioning
- d) Clustering
- e) Researching

Others:.....

.....

Section Three: Concept Mapping

Q12. During the pre-writing stage, do you encourage them to use graphic organisers?

Yes No

If yes, please indicate which type of graphic organisers do you usually introduce.

.....
.....
.....

Q13. Do you specifically encourage them to employ the concept mapping pre-writing strategy?

Yes No

If you select 'no', please justify

.....
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.....

Q14. Concept mapping is considered one of the most powerful educational tools to enhance learning. What do you think about its incorporation as a pre-writing strategy to improve learners' writing performance?

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.....

If you would like to add any comments or suggestions, please feel free.

.....
.....

Thank You Very Much for Your Help and Collaboration

Appendix 7: Interview Guide

1. How do you rate writing in term of difficulty after the concept mapping training?
 - a. Easy
 - b. medium
 - c. difficult
2. What specific changes or improvements, if any, did you notice in your writing performance after implementing the concept mapping pre-writing strategy?
3. How do you feel concept mapping impacted the ideas and structure of your written work?
4. Does concept mapping help you develop writing mechanics? Explain.
5. How do you find the use of concept mapping compared to other pre-writing strategies you've tried?
6. What is your attitude towards the use of concept mapping in the pre-writing stage?
7. What challenges, if any, did you encounter while implementing concept mapping in the pre writing stage? Explain
8. What do you suggest to solve these problems?
9. Why or why not do you plan to continue using concept mapping in your future writing endeavors?
10. Feel free to add any recommendation to make the use of concept mapping as a pre writing strategy more efficient.

Appendix 8: Pilot Pretest/Posttest Scores for Both Raters

Students	Pilot Pretest Scores	
	Rater 1	Rater 2
1	9.5	8.5
2	5	7
3	7	6
4	10	14.5
5	17.5	16
6	13.5	15
7	7	9
8	10.5	7.5
9	9	9

Students	Pilot Posttest Scores	
	Rater 1	Rater 2
1	10	8.00
2	11.5	12
3	7.5	9
4	11	11
5	13	12
6	11	11
7	8	7.5
8	7.5	10
9	9	10

Appendix 9: SPSS Results

Checking normality

Descriptives

			Statistic	Std. Error
pretest scores	Mean		8.0645	.41977
	95% Confidence Interval for Mean	Lower Bound	7.2072	
		Upper Bound	8.9218	
	5% Trimmed Mean		7.9960	
	Median		8.7500	
	Variance		5.462	
	Std. Deviation		2.33717	
	Minimum		4.25	
	Maximum		14.00	
	Range		9.75	
	Interquartile Range		3.50	
	Skewness		.220	.421
	Kurtosis		-.157-	.821
	posttest scores	Mean		13.3629	.49579
95% Confidence Interval for Mean		Lower Bound	12.3504	
		Upper Bound	14.3754	
5% Trimmed Mean			13.3638	
Median			13.0000	
Variance			7.620	
Std. Deviation			2.76046	
Minimum			7.50	
Maximum			18.50	
Range			11.00	
Interquartile Range			4.50	
Skewness			.165	.421
Kurtosis			-.508-	.821

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest scores	.131	31	.185	.954	31	.202
posttest scores	.129	31	.200*	.973	31	.609

Paired Samples Statistics for overall writing performance

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest scores	8.0645	31	2.33717	.41977
	posttest scores	13.3629	31	2.76046	.49579

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	pretest scores - posttest scores	-5.29839	2.93145	.52650	-6.37365	-4.22312	10.063	30	.000

Paired Samples Statistics for content

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	content pre	3.0726	31	1.31052	.23538
	content post	5.5887	31	1.19817	.21520

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	content pre - content post	-2.51613	1.75230	.31472	-3.15888	-1.87338	7.995	30	.000

Paired Samples Statistics for organisation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	organisation pre	2.5565	31	.98469	.17686
	organisation post	5.4274	31	1.39073	.24978

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	organisation pre - organisation post	2.87097	1.55439	.27918	3.44112-	2.30081-	10.284	30	.000

Paired Samples Statistics for mechanics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	mechanics pre	2.4355	31	.97461	.17505
	mechanics post	2.3468	31	.58337	.10478

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	mechanics pre - mechanics post	.08871	.74035	.13297	-.18285-	.36027	.667	30	.510

Appendix 10: Writing Analytical Scoring Rubrics

Writing	Level	Score	Criteria
Content/8	Very good to excellent	6.5-8	Knowledgeable. Substantive. Thorough development of topic sentence. Relevant to assigned topic (No irrelevant ideas).
	Average to good	4.5-6	Some knowledge of subject. Adequate range. Limited development of topic sentence. Mostly relevant to topic, but lacks details.
	Poor to fair	2.5-4	Limited knowledge of subject. Little substance. Inadequate development of topic.
	Very poor	0-2	Does not show knowledge of subject. Non-substantive. Not pertinent. Not enough to evaluate.
Organisation/8	Very good to excellent	6.5-8	Appropriate existing title. Strong, effective, and interesting topic sentence, clearly states the main idea. The main idea is clearly supported by at least four (4+) supporting sentences. They are logical, relevant, or supportive of the main idea Succinct and Well-organised. Fluent expression, logical sequencing and order Transitions: varied, appropriate, in entire paragraph. Complete, Logical concluding sentence, restates the main idea effectively.
	Average to good	4.5-6	Adequate existing title. Complete Topic sentence, clearly states the main idea. The main idea is supported by three supporting sentences (Limited support). Some may not be relevant, logical, or supportive of the main idea. Somewhat choppy. Sequence is logical. Transitions are appropriate and limited.

			Complete concluding sentence, adequately sums up the paragraph.
	Poor to fair	2.5-4	Absence of title Poorly written minimally recognisable topic sentence. The main idea is not entirely clear. The main idea is supported by less than three supporting sentences. Some may not be relevant, logical, or supportive of the main idea. Non-fluent. Ideas confused or disconnected. Lacks logical sequencing and development. Transitions: not enough, inappropriate. Incomplete concluding sentence, does not sum up the paragraph.
	Very poor	0-2	Absence of title Absence of Topic sentence. No supporting sentences are provided Does not communicate, not enough to evaluate No apparent organisation. Absence of transitions. Absence of concluding sentence.
Mechanics/4	Very good to excellent	3.5-4	Demonstrates mastery of conventions No problems of spelling, punctuation, capitalisation, paragraphing Paragraph indented
	Average to good	2.5-3	Occasional problems (less than 4) of spelling, punctuation, capitalisation, paragraphing but meaning not obscured
	Poor to fair	1.5-2	Frequent and severe errors of spelling, punctuation, capitalisation, paragraphing Poor handwriting Meaning confused or obscured
	Very poor	0-1	No mastery of conventions Dominated by errors of spelling, punctuation, capitalisation, paragraphing Handwriting illegible Not enough to evaluate

Adapted from Jacobs et al' s 1981 scale (as cited in Weigle, 2002)

Appendix 11: MAXQDA Code System

Code System

Code System	Frequency
Code System	100
writing difficulty	4
medium	1
easy	3
writing components	4
purpose	1
content	3
syntax	2
organisation	3
writing process	2
ideas and structure	4
ideas	1
visualising gaps	1
originality and variation	1
conciseness and clearness	3
organisation	2
idea generation	3
structure	1
organisational structure	4
mechanics	4
no	3
somehow	1
comparison	4
more beneficial	4
attitude	4
..positive	4
challenges	4

time	2
background knowledge	2
solutions	4
topic choice	1
future research	1
practice	4
future use	4
yes	4
recommendations	4
early use	3

Codes		100
writing difficulty		4
medium		1
easy		3
writing components		4
purpose		1
content		3
syntax		2
organisation		3
writing process		2
ideas and structure		4
ideas		1
visualising gaps		1
originality and variation		1
conciseness and clearness		3
organisation		2
idea generation		3
structure		1
organisational structure		4
mechanics		4
no		3
somehow		1
comparison		4
more beneficial		4
attitude		4
..positive		4
challenges		4
time		2
background knowledge		2
solutions		4
topic choice		1
future research		1
practice		4
future use		4
yes		4
recommendations		4
early use		3
Sets		0

Appendix 12: Interview Manuscripts

	1	Arafa
writing difficulty	2	Q1. How do you consider writing in term of difficulty after the concept mapping training?
..easy	3	R1. Easy
writing components	4	Q2. After the concept mapping study sessions, what specific writing components do you think concept mapping works on to improve?
..content	5	R2. I usually go out of topic. After working with concept mapping, I have noticed that having many ideas and thoughts becomes less hard especially the relevant ones. It also helped me to brainstorm ideas and write about them. It also helped me to follow the track of these ideas and revise them. I am also able to write correct sentences about supporting ideas and others about examples.
..writing process		
..syntax		
ideas and structure	6	Q3. How does concept mapping impacted the ideas and structure of your written work?
..idea generation	7	R3. Concerning ideas, it helped me to have innovative ideas that I cannot add if I only used free writing. Through the concept map, I can always add my own ideas and observe them to modify them. I used to have simple irrelevant ideas. Now, I can use more ideas, best ideas, multiple ideas. After using it, I was able to write concisely and in a way that is direct to the point. Concerning structure, I used to write paragraphs in many paragraphs, not one block. Now my writing is more organised, stick to the right shape of writing, not exceeding the limited space and words.
..originality and variation		
..conciseness and cleanness		
..organisational structure		
mechanics	8	Q4. Does concept mapping help you develop writing mechanics? Explain.
..no	9	R4. I do not feel any change in my writing when it comes to mechanics

..no	}		because I still have the same problems even after using concept mapping.
comparison	[	10	Q5. How do you find the use of concept mapping compared to other pre-writing strategies you've tried?
..more beneficial	[	11	R5. I have never used a writing strategy because I used to write the text directly. That is why all the ideas keep flying around my head, and I am always lost in the flow of ideas. Since I started used concept mapping, I liked it. It is a guide for me because it ameliorates my writing style.
attitude	[	12	Q6. What is your attitude towards the use of concept mapping in the prewriting stage?
...positive	[	13	R6. My opinion about it is so positive. I see it is a beneficial strategy; therefore, I am so satisfied with it.
challenges	[	14	Q7. What challenges, if any, did you encounter while implementing concept mapping in the pre writing stage? Explain
..time	[	15	R7. Concept maps are so easy to generate and practiced. The only problem I faced is that it seems to take some time to come up with ideas, especially if I do not know them before drawing the map.
solutions	[	16	Q8. What do you suggest to solve these problems?
..practice	[	17	R8. Providing more practice until we learn how to use it in a quick way is the solution that I can suggest. As people say, practice makes perfect.
future use	[	18	Q9. Why or why not do you plan to continue using concept mapping in your future writing endeavors?
..yes	[	19	R9. Yes, I will definitely use it not only in written expression, but also in many other courses such as civilisation. Civilisation contains many ideas that are difficult to be memorised.

- recommendations { 20 **Q10. Feel free to add any recommendation to make the use of concept mapping as a pre writing strategy more efficient.**
- ...early use { 21 **R10. I suggest to be used from a younger age so that students get used to it. Although I am an auditory learner, it helped me a lot.**

	1	Hadil
writing difficulty	2	Q1. How do you consider writing in term of difficulty after the concept mapping training?
..medium	3	R1. Medium
	4	Because I still have some problems of grammar and vocabulary although I have felt a noticeable improvement in my writing level especially after having your lessons.
writing components	5	Q2. After the concept mapping study sessions, what specific writing components do you think concept mapping works on to improve?
..content	6	R2. I see that concept mapping helps a lot in improving writing. It improves all writing skills especially the number of ideas. I see myself able to write about many ideas when I am thinking about the topic and drawing my map. When finishing drawing the map and I start writing, I do not make many mistakes when writing sentences because I can write full and correct ones. Now, I can also write a good form of a paragraph not like before when I used to write a paragraph in many sections. It helps me to go through my writing to see all ideas.
..syntax		
..organisation		
ideas and structure	7	Q3. How does concept mapping impacted the ideas and structure of your written work?
..conciseness and cleanness	8	R3. Before, when I was writing, I had had a mess in my mind. Before concept mapping, I kept repeating the same ideas without realising this. I was always overwhelmed with many thoughts and information. It was stressful to limit and organise my thinking during writing. After using concept mapping, all ideas become more apparent, organised, and not repeated. Concept mapping made me aware of that and makes each statement unique from the other. It helped me to organise my mind and
..ideas		
..organisation		

..organisation	}		to go directly to the point to write about. It helped me to write about
..idea generation	}		many ideas and more examples. I used to forget to mention examples.
..ideas	}		At the end of my writing, I usually discover that I did not put examples.
..organisational structure	}		After learning about the concept map, I see that I mention all examples.
..structure	}		It also pushed me to go and do further research on the topic in order to
mechanics	}		better identify the relationships between nodes and between previous
..somehow	}	9	Q4. Does concept mapping help you develop writing mechanics? Explain.
comparison	}	10	R4. Before, I did not know where the idea started and finished. I was
..more beneficial	}	11	just writing randomly. Now, concept mapping helps me to know the
attitude	}	12	topic sentence, details, and examples, and I then put the full stop to
....positive	}	13	match them. That is all, i don't see any other effect.
..more beneficial	}	14	Q5. How do you find the use of concept mapping compared to other pre-writing strategies you've tried?
attitude	}	15	R5. I used to apply free writing and listing. They are helpful but they
....positive	}	16	did not help me organise ideas. I was writing in a real mess. After
attitude	}	17	attending with you and having all the tasks done, I see that the strategy
....positive	}	18	of concept mapping sharpens thinking, so it is more beneficial than
attitude	}	19	freewriting and listing.
....positive	}	20	Q6. What is your attitude towards the use of concept mapping in the prewriting stage?
attitude	}	21	R6. It is a great tool. It should be used in all subjects. After my
....positive	}	22	exposure to concept mapping with you, I tried it with my brother in
attitude	}	23	history, geography, and mathematics. It helped him to understand and
....positive	}	24	memorise the lesson easily. Although I know mind mapping, this one is

<p>....positive</p>	<p>15</p>	<p>better because what is special about it is the relationships. In mathematics, he could not differentiate between functions. So, I introduced him to a simple concept map to show and differentiate between different relationships.</p>
<p>challenges</p>	<p>15</p>	<p>Q7. What challenges, if any, did you encounter while implementing concept mapping in the pre writing stage? Explain</p>
<p>..background knowledge</p>	<p>16</p>	<p>R7. The concept map is easy to learn and draw. I learned it easily and all my maps were similar to yours. So, I did not face any challenges in the way of making maps and applying them in the prewriting stage. However, when I do not have enough information about the subject of the paragraph, I find difficulty brainstorming many ideas and put them in the map.</p>
<p>solutions</p>	<p>17</p>	<p>Q8. What do you suggest to solve these problems?</p>
<p>..practice</p>	<p>18</p>	<p>R8. To solve the problem, we need more practice and to do it over and over again to draw the concept map faster. We should have a good background about the subject, such as to read first or conduct a literature review before drawing the map. This is helpful to enhance ideas remembering and creation.</p>
<p>..future research</p>		
<p>future use</p>	<p>19</p>	<p>Q9. Why or why not do you plan to continue using concept mapping in your future writing endeavors?</p>
<p>..yes</p>	<p>20</p>	<p>R9. Yes, I will use it. If I have time, I will draw a complex concept map. If I do not have much time as in exams, I will draw a simplified one. So, in all cases, I will use it. I will use it in writing, as I will use it in civilisation and linguistics because they have several interrelated ideas.</p>
<p>recommendations</p>	<p>21</p>	<p>Q10. Feel free to add any recommendation to make the use of</p>

recommendations | **concept mapping as a pre writing strategy more efficient.**

..early use | 22 **R10.** I suggest that concept mapping should be practiced at an early age, since childhood or primary school.

Appendix 13: Concept Mapping Mini-Syllabus

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

MOHAMED KHIDER UNIVERSITY – BISKRA

FACULTY OF LETTERS AND FOREIGN LANGUAGES

DEPARTMENT OF LANGUAGE AND ENGLISH LITERATURE



Written Expression

Course Description and Syllabus

October/November/December 2023-2024

Instructor: HENOUDA Meriem

Email: henoudameriem9@gmail.com

Class Meeting Days: Mondays and Tuesdays

Class Meeting Time: Mondays (11:20 – 12:20)

Tuesdays (9:40 - 10:40)

Course description

Writing is an essential language skill, for it yields a significant impact on academic and professional success. It serves as an appropriate tool for expressing ideas, thoughts, and feelings. To effectively transmit a specific message and convey a given meaning, the practice of writing strives to produce pertinent and well-constructed texts that are predominantly the end result of a collection of component skills such as content, vocabulary, organisation, language use, and mechanics. This skill involves higher-order thinking skills based on diverse mental processes and abilities. To produce a coherent and well-structured piece of work, writers must typically plan and organise their thought, thereby undergoing the major stages of generating ideas, planning, drafting, revising, and publishing. The use of efficient writing strategies is encouraged to produce high-quality, focused text. One of these strategies that has recently gained ground is the Novakian concept mapping.

The goal of this course is first to provide an overview of the skill of writing, providing a detailed and comprehensive description of its definitions, approaches, components, and stages. It also focuses on language learning strategies, writing strategies, and pre-writing strategies. It also strives to familiarise students with this advanced pre-writing strategy by introducing them to its foundational aspects, namely characteristics, theoretical underpinning, types, components, creation process, and applications. This syllabus does not only supply theoretical information on writing skill and concept mapping but also provide practical opportunities and tasks on how to draw concept maps.

A combination of lectures, in-class discussions, and written assignments will be used in this course.

Objectives and Learning Outcomes

After the course is successfully completed, the writing performance of third year English students at Biskra University will be improved. Specific learning objectives of this course are:

- Gaining a profound understanding of what Novakian concept maps,
- Specifying its types, components, theoretical underpinning, and applications,
- Introducing some concept map samples,
- Accurately drawing some concept maps based on texts, and
- Producing paragraphs based on concept maps.

Course Materials

Handouts, board, data show.

Announcements: Class announcements will be e-mailed and/or posted.

Assessment Procedure:

This course will be assessed by means of pretest, posttest, and classwork.

References

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- Bai, B. (2016). *Writing Strategies and Strategy-Based Instruction in Singapore Primary Schools*. Cambridge Scholars Publishing.
- Ban Shihab, A. (2020). The Effect of Using Concept Mapping on Developing EFL Students' Writing Skills. *Journal of University of Garmian*, 7(1). <https://doi.org/10.24271/garmian.207114>
- Cañas, A. J., & Novak, J. D. (2010). The theory underlying concept maps and how to construct and use them. *DOAJ: Directory of Open Access Journals*).
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- Mayfield Clinic. (2018). *Anatomy of the Brain*. Retrieved from <https://Mayfieldclinic.com/Pe-Anatbrain.htm>
- Tabatabaei, O., & Khalili, S. (2015). The effect of concept mapping on Iranian Pre-intermediate 12 reading comprehension. *Journal of Language Teaching and Research*, 5(6), 1368–1380.

Session 1: The Pretest

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third Year. Group 7
The pretest objectives: The pretest will be administered in an attempt to assess and determine students' writing performance prior to the study sessions.	

Pretest Correction:

The collection of the pretest paragraphs of student were thoroughly reviewed and accurately assessed by the two raters using the writing analytical scoring rubric (shown below), which was adapted from Jacobs et al's 1981 scale (as cited in Weigle, 2002).

Writing Analytical Scoring Rubric

Writing	Level	Score	Criteria
Content/8	Very good to excellent	6.5-8	Knowledgeable. Substantive. Thorough development of topic sentence. Relevant to assigned topic (No irrelevant ideas).
	Average to good	4.5-6	Some knowledge of subject. Adequate range. Limited development of topic sentence. Mostly relevant to topic, but lacks details.
	Poor to fair	2.5-4	Limited knowledge of subject. Little substance. Inadequate development of topic.
	Very poor	0-2	Does not show knowledge of subject. Non-substantive. Not pertinent. Not enough to evaluate.
Organisation/8 title topic stc supporting stcs concluding transition words logical development organisation pattern	Very good to excellent	6.5-8	Appropriate existing title. Strong, effective, and interesting topic sentence, clearly states the main idea. The main idea is clearly supported by at least four (4+) supporting sentences. They are logical, relevant, or supportive of the main idea Succinct and Well-organised. Fluent expression, logical sequencing and order Transitions: varied, appropriate, in entire paragraph. Complete, Logical concluding sentence, restates the main idea effectively.
	Average to good	4.5-6	Adequate existing title. Complete Topic sentence, clearly states the main idea. The main idea is supported by three supporting sentences (Limited support). Some may not be relevant, logical, or supportive of the main idea. Somewhat choppy. Sequence is logical. Transitions are appropriate and limited. Complete concluding sentence, adequately sums up the paragraph.
	Poor to fair	2.5-4	Absence of title Poorly written minimally recognisable topic sentence. The main idea is not entirely clear. The main idea is supported by less than three supporting sentences. Some may not be

			<p>relevant, logical, or supportive of the main idea.</p> <p>Non-fluent.</p> <p>Ideas confused or disconnected.</p> <p>Lacks logical sequencing and development.</p> <p>Transitions: not enough, inappropriate.</p> <p>Incomplete concluding sentence, does not sum up the paragraph.</p>
	Very poor	0-2	<p>Absence of title</p> <p>Absence of Topic sentence.</p> <p>No supporting sentences are provided</p> <p>Does not communicate, not enough to evaluate</p> <p>No apparent organisation.</p> <p>Absence of transitions.</p> <p>Absence of concluding sentence.</p>
Mechanics/4	Very good to excellent	3.5-4	<p>Demonstrates mastery of conventions</p> <p>No problems of spelling, punctuation, capitalisation, paragraphing</p> <p>Paragraph indented</p>
	Average to good	2.5-3	<p>Occasional problems (less than 4) of spelling, punctuation, capitalisation, paragraphing but meaning not obscured</p>
	Poor to fair	1.5-2	<p>Frequent and severe errors of spelling, punctuation, capitalisation, paragraphing</p> <p>Poor handwriting</p> <p>Meaning confused or obscured</p>
	Very poor	0-1	<p>No mastery of conventions</p> <p>Dominated by errors of spelling, punctuation, capitalisation, paragraphing</p> <p>Handwriting illegible</p> <p>Not enough to evaluate</p>

Lesson 1: Introduction to written expression: Background and strategies

Lecturer's name: HENOUDA Meriem	
Course: written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
<p>Lesson objectives: At the end of this session, students will be able to recognise what reading and reading comprehension are.</p> <p>At the end of this session, students will be aware of the importance of reading in language learning, types of reading, components of reading comprehension, and the different reading comprehension strategies.</p>	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> •Warm-up: Asking Questions, discussion •Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 Min
<p>Part 1</p> <ul style="list-style-type: none"> •Defining writing •Types of writing •Competences of quality writing <p>Part 2</p> <ul style="list-style-type: none"> •Define a paragraph •Paragraph types •Paragraph elements •Good paragraph characteristics • Writing stages 	Lesson presentation Reading and explanation	Listening Intervention, discussion, suggestions	50 min

<p>Part 3</p> <ul style="list-style-type: none">•Writing strategies importance•Writing strategies types•Pre-writing strategies•Pre-writing strategies' role•Pre-writing strategies' types			
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Lesson 1: Introduction to written Expression: Background and Strategies

Part 1 Understanding Writing

At the end of this section, you will be able to:

- Define writing as a skill
- State the types of writing
- Itemise the fundamental competences of quality writing

Part 2 Introduction to Paragraph Writing

At the end of this section, you will be able to:

- Define a paragraph
- Recognise the types of paragraphs
- Identify the structural elements of a paragraph
- Specify the characteristics of a good paragraph
- Think about the stages of the writing process

Part 3 Introduction to Writing Strategies

At the end of this section, you will be able to:

- Define and specify the importance of writing strategies
- Indicate the Categories of writing strategies
- Define Pre-writing strategies
- Emphasise the role of pre-writing strategies
- Pinpoint the Types of Pre-writing strategies

Part 1 Understanding Writing

1. Definition of Writing:

There are various scholarly perspectives illustrating the distinctive ways in which writing can be interpreted and viewed. Based on their experiences and philosophies, authors have often developed unique definitions of writing such as:

Widdowson (2001) asserts, “writing is the use of the visual medium to manifest the graphological and grammatical system of the language.” (p.62).

Flower and Hayes (1981) point out, “writing is best understood as a set of distinctive thinking processes which writers orchestrate or organize during the act of composing” (p. 366).

Hedge (2000) avers, “writing is the result of employing strategies to manage the composing process, which is one of gradually developing a text” (P. 302).

Q. Reflect on the above-mentioned example definitions and provide a simple definition of writing.

Possible answer.

Writing is the practice of using written symbols to express thoughts, ideas, or information. It is complex, and multifaceted cognitive activity that requires putting words and sentences together to produce coherent and well-structured texts. Writing is a purposeful tool that involves the intentional use of various strategies to effectively convey meaning and communicate messages to a *specific audience*.

2. Types of Writing:

In general, there are four basic types of writing namely expository, persuasive, descriptive, and narrative.

Expository writing

Expository writing is a factual sort of writing, free from personal opinions, used to explain and provide information about a given topic. It aims to deliver a clear and concise explanation about a subject by exploring ideas and providing *reasons, facts and statistical information*. academic essays, research papers, and newspaper articles can all fall in the expository writing style.

Persuasive writing

Persuasive (or argumentative) writing is a form of communication in which the writer aims to convince the reader or audience to adopt a particular point of view or take a specific action, claiming that the stand recommended by him is the most valid one. The primary goal of persuasive writing is to persuade or influence the reader's beliefs, attitudes, or behaviours by providing reasons, arguments and justifications. Examples of persuasive writing can be found in various forms, such as opinion editorials, complain letters, advertisements, speeches, T.V commercials, essays, and political campaigns.

Descriptive writing

Descriptive writing use descriptive language to paint a vivid picture or idea of a person, location, object, or experience. The purpose of descriptive writing is to engage the audience's senses and imagination so that they can envision the authors' description. In descriptive writing, authors frequently use sensations such as sight, sound, taste, touch, and smell to provide the reader with an enjoyable and immersive experience. The use of figurative language, emotional impact, and imagery contribute to the creation of a clear and appealing mental image.

Narrative writing

Narrative writing is a type of writing in which a writer narrates a story, tells a tale, or recounts a series of events. Characters, a setting, a plot with a series of events are all common components of narrative writing. Common examples of narrative writing include novels, short stories, novellas, poetry, and biographies.

3. Fundamental Competences of Quality Writing:

The practice of writing is predominantly the ending result of a collection of component skills. To effectively write in English, skilled writers must reveal some fundamental competences that may comprise:

Mechanics

Mechanics of writing refer to graphic rules, conventions, and the technical aspects of writing that should be considered when making up accurate and readable language. Producing a text free from any problems with regard to capitalisation, punctuation, abbreviation, layout, spellings, and handwriting is essential for clear and effective communication.

Grammar

Grammar refers to the employment of grammatical knowledge of the language governing word formation and sentence construction. Good writers should be comprehensively knowledgeable about how words are formed (morphology) and how these words are arranged to structure phrases, clauses, and sentences (syntax). It is evident that well-formed words and well-structured sentences help convey ideas clearly and accurately, allowing readers to keep the writer's track of thought.

Audience

Another component criterion of effective written text is the consideration of the targeted audience. Knowing who you are writing for is crucial in producing reader-based prose. A written production that conforms with the readers' expectations encourages them to effectively capture the message and meaning of text, as well as keeping their engagement high. Becoming conscious about such parameters as readers' gender, age, social class, nationality, ethnicity, and religion serves to guide writers to shape the text in terms of content, tone style, structure, and language.

Purpose

Scholars have long determined concern about the issues of purposefulness in writing. The purpose reflects the reasons for writing or the intentions of authors who may wish to inform, persuade, instruct, entertain, invite, describe, apologise, narrate, offer, evaluate, suggest, etc. Writers should consciously develop a sense of purpose so that to guide the choice of what to include and how to say it. This is in terms of content, form (structural pattern of text), register (type of vocabulary), grammar, and tone.

Content

Another element the writers need to be attentive to is the content knowledge they are required to write about. To write meaningfully about a particular subject area, authors endeavour to generate relevant, clear, and detailed initial notes that will result in logical progression of ideas. However, they are likely to find it arduous to proceed in planning and drafting about a theme or topic they have little or no background knowledge about. The teacher may serve as an appropriate help for students to develop a good knowledge about the assigned topic (schemata).

Word choice

Word choice denotes the accurate and appropriate employment of specific vocabulary (diction) to help achieve a well determined communicative purpose and transmit a particular message. Any vocabulary misuse will likely change and diffuse the message, resulting in confusion or miscommunication. Therefore, effective writers need to give special attention to the selection of best suited and most fitting lexical units from a wide range of vocabulary items.

Organisation

Producing a well-formed high-quality writing stresses the need to focus also on the text construction pattern. The successful and effective communication of meaning requires an informed selection of the adequate text structure and content organisation. Each genre has specific formats and strict way of designing its organisational structure and layout. Sentences, evidence, paragraphs, and the overall text have to be ordered and sequenced logically and meaningfully.

Part 2 Introduction to Paragraph Writing**1. Definition of a paragraph**

A paragraph is a self-contained piece of writing that usually consists of a series of sentences related in content and structure and which focuses on a single idea, topic, or theme. It typically begins with an indentation and is separated from other paragraphs by a blank line or an indentation.

2. Types of paragraphs

Based on their purpose and structure, paragraphs can be classified into several sorts. Here are some examples of popular paragraph types:

Narrative paragraphs: tell a story or describe a sequence of events and they often include characters, setting, and a plot.

Descriptive paragraphs: provide detailed sensory information about a person, place, or thing. They use vivid language to create a mental picture for the reader.

Expository or informational paragraphs: explain or inform the reader about a specific topic. Present facts, details, and examples to support the main idea.

Persuasive paragraphs: convince the reader to adopt a particular point of view or take a specific action. They use arguments, evidence, and persuasive language.

Compare and contrast paragraphs: highlight similarities and differences between two or more things. They typically use transitional words like "similarly," "on the other hand," etc.

Cause and effect paragraphs: explore the reasons (causes) and/or consequences (effects) of a particular event or situation.

Problem-solution paragraphs: identify a problem and propose one or more solutions by presenting evidence and reasoning to support the proposed solutions.

Definition paragraphs: define a specific term or concept. They may include examples, characteristics, or functions of the defined term.

Process paragraphs: describe a series of steps or actions to accomplish a task or achieve a result.

Classification paragraphs: group items or ideas based on common characteristics or criteria.

Summary paragraphs: summarize the main points or key information from a larger piece of text.

Concluding paragraphs: sum up the main ideas of a piece of writing by providing a sense of closure to the reader.

3. Structural elements of a paragraph

Well-structured and effective paragraphs consist of three key elements: a topic sentence, supporting sentences, and concluding sentence.

Topic sentence

The topic sentence expresses and introduces the main idea or point of the paragraph. It directs the reader's attention to the important ideas presented in detail in the sentences that follow (known as supporting sentences). A topic sentence consists of the topic and one or two controlling ideas, which are used to further explain the paragraph and limit its scope.

topic sentence= topic + controlling idea

Supporting sentences

The supporting sentences follow the topic sentence in order to develop the main idea and expand on the central theme of the paragraph. Depending on the purpose of the paragraph, the supporting sentences can come in various forms including explanations, examples, evidence, reasons, description, etc.

Concluding sentence

The concluding sentence summarises the main point of the paragraph or restates the main idea again with different wording. It helps to bring closure to the paragraph and prepare the reader for the next paragraph.

4. Characteristics of a Good Paragraph

Unity

Unity means that all sentences are directly related to the main idea expressed in the topic sentence. Each sentence should contribute to the development of the central theme without introducing unrelated or off-topic information. That is, unity in a paragraph means that all sentences discuss and support one and only one single idea from beginning to end.

Coherence

Coherence refers to the logical and clear organisation of ideas within a paragraph. Simply, sentences should follow a logical order and there should be a clear progression of thought from the beginning to the end. It is characterised by the use of appropriate transition signals.

Transitions

Transitions are words or phrases that connect sentences and ideas within a paragraph, facilitating the smooth flow of thought. Common useful transitions may include the following:

Addition:

Again, and, also, besides, equally important, first (second, etc.), further, furthermore, in addition, in the first place, moreover, next, too

To give examples:

For example, for instance, in fact, specifically, that is, to illustrate

To compare:

Also, in the same manner, likewise, similarly

To contrast:

Although, and yet, at the same time, but, despite, even though, however, in contrast, in spite of, nevertheless, on the contrary, on the other hand, though, yet

To summarize or conclude:

All in all, in conclusion, in other words, in short, in summary, on the whole, that is, therefore, to sum up

To show time:

After, afterward, as, as long as, as soon as, at last, before, during, earlier, finally, formerly, immediately, later, meanwhile, next, since, shortly, subsequently, then, thereafter, until, when, while

To show place or direction:

Above, below, beyond, close, elsewhere, farther on, here, nearby, opposite, to the left
(north, etc.)

Conciseness

A good paragraph strives for clarity and conciseness, avoiding unnecessary repetition or redundancy in writing.

Consistency

Good paragraphs maintain consistency in verb tense and point of view throughout the paragraph unless there is a deliberate shift for a specific reason.

Completeness

A good paragraph fully explores the main idea, leaving no room for confusion or ambiguity. It should answer the reader's questions about the topic.

5. Stages of the writing process

The most common steps or stages that effective writers often follow are pre-writing, drafting, revising, editing, and publishing.

Pre-writing stage

Pre-writing (planning) is the first and most critical stage of the writing process. It guides writers to plan their work and explore, generate, organise, and clarify their thoughts. During this stage, writers activate prior knowledge about a given topic. They clearly define and consider the topic, its purpose, content, and target audience. This stage can be effectively

achieved using multiple pre-writing techniques, some of which include listing, brainstorming (*individually or as a whole class activity*), and visual diagrams or maps.

Drafting stage

Drafting, or actual writing is transforming initial thoughts generated in the pre-writing stage into a draft document. The draft stage is especially crucial for creating a rough version of the text by putting content knowledge and translating ideas digitally or down on paper. The aim of this stage is not fundamentally to achieve error-free writing.

Revising stage

This stage involves reading, reviewing, and revising the written product for any appropriate changes in content, organisation, and structure, without paying too much attention to grammar and mechanics. Revision can be realised through self-correction or by receiving feedback from instructors or peers. It majorly addresses improving the draft in terms of clarity, coherence, wordiness, and effectiveness. The writer may work on modifying sentences, revising topic sentence, adding or eliminating content, and rearranging ideas.

Editing stage

Editing focuses on refining, proofreading, and correcting the work with regard to the mechanics of writing. The writer addresses the mistakes, errors, and irrelevancies appearing not only at the level of grammar, but also in spelling, punctuation, capitalization, refencing style, and formatting. In editing, the writer wishes to ensure achieving high-quality writing that conforms to the writing conventions and formatting guidelines. Producing well-structured error-free written work adds to its readability, making it sound more professional.

Publishing stage

The final phase of the writing process is publishing where the revised and edited final work is prepared for distribution, sharing, and publication. This involves submitting the piece of writing to the intended audience, who can be anyone interested in reading it including the teacher, peers, family, community, or public. Depending on the writer's objectives, publication can potentially vary, entailing turning in the finalised product as a classroom assignment, uploading it online, submitting it to a publisher, or sharing it on social media.

Part 3 Introduction to Writing Strategies

At the end of this section, you will be able to:

1. Definition and Importance of Writing Strategies

Writing strategies refer to any conscious plan or action purposefully employed by writers to effectively plan, draft, revise, and edit their written work. The use of multiple strategies is one characteristic of proficient writers.

Writing strategies help in organising thoughts and ideas logically, leading to clear and precise communication. They are particularly advantageous for generating ideas, planning, drafting, and revising. They help writers to write more effectively and overcome writing difficulties.

2. Categories of Writing Strategies

There are several taxonomies of writing strategies. For example, Petric and Czár (2003) subdivided writing strategies *into* before writing strategies, while-writing strategies, and revising strategies.

Examples of before writing strategies

I write an outline of my paper

I write notes in my native language

I think about what I want to write and have a plan in my mind

Examples of while-writing strategies

I stop after each sentence to read it again

I stop after a few sentences or a whole paragraph

I reread what I have written to get ideas how to continue

If I don't know a word in English, I write it in my native language and later try to find an appropriate English word

If I don't know a word in English, I find a similar English word that I know

If I don't know a word in English, I stop writing and look up the word in the dictionary

Examples of revising strategies

I read my text aloud

I use a dictionary while revising

I leave the text aside for a couple of days and then I can see it in a new perspective.

I show my text to somebody and ask for his/her opinion.

3. Definition and Role of Pre-writing strategies

Pre-writing strategies are the techniques and activities that authors seek prior to beginning the actual process of writing. These tactics are intended to assist authors in coming up with ideas, organizing their thoughts, and planning the framework of their writing.

4. Types of Pre-writing strategies

Pre-writing is an important step in the writing process since it establishes the foundation for a well-structured and coherent piece of writing. Some common Pre-writing strategies include:

brainstorming, freewriting, writing assertions, questioning, clustering, using the patterns of development, looping, and graphic organisers.

Brainstorming

Brainstorming involves generating a list of whatever comes to mind as quickly as possible. The major focus of brainstorming is quantity, with the attempt to generate a large number of ideas without initially evaluating or critiquing them.

Freewriting

Freewriting involves writing everything that comes into head, usually for an allotted period of time (e.g. 10 minutes). The authors keep writing a string of sentences freely and continuously, without regard to editing the irrelevancies even if what is written appears incorrect and disorganised.

Questioning

Questioning involves generating and collecting content by asking a series of questions about the subject (e.g., who, what, where, when). Questions can stimulate critical thinking, resulting in a deeper exploration and understanding of the topic at hand.

Clustering

Clustering is a visual technique that has also been called mind mapping, idea mapping, or webbing. It is a process wherein the main ideas, sub ideas, supporting details and relationships are visually displayed and expanded to form a web-like diagram.

Researching

The writing activity can require conducting research in the library or on the internet to gather relevant information and facts about a specific topic.

Graphic organisers

More importantly, they can assist students and writers to plan, visualise, and organise their thoughts and ideas before they begin writing. Venn diagrams, timeline charts, tree diagrams, KWL charts, story pyramid, fishbone planner, cornell note-taking, double bubble map, concept maps, and many of these.

Thanks for your attention

Lesson 2: Concept Mapping Guide and tutorial

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, students will be able to identify and differentiate concept mapping based on its defining characteristics students will be able to recognise concept maps and state their components. They will be able to specify the steps to construct them correctly.	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions, discussion • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Concept mapping definition • Concept mapping origins • Types • Characteristics • Creation and Process • Benefits in education 	Lesson presentation Reading and explanation	Listening	30 min
Steps of constructing a concept map Task	Presenting	Listening	20 min

Lesson 2: Concept Mapping Guide and tutorial

At the end of this session, you will be able to:

- Define concept mapping
- Determine its origins
- Specify kinds of concept mapping
- List its characteristics
- Create a concept map
- Pinpoint the benefits of concept mapping in education

1. Concept Mapping Definition

A concept map is a graphic organiser used to structure information and Display bodies of knowledge explicitly and concisely. It visually represents and organises a set of connected concepts and ideas belonging to the same topic, lesson, or unit. Concept maps are often used to facilitate the understanding of complex topics, Explore and clarify ideas, and demonstrates the connections between different concepts.

2. Origins Of Concept Mapping

In 1972, concept mapping was designed and proposed in the course of Novak's research program at Cornell University. This research program was later published in nine languages.

3. Kinds of Concept Maps

The most widely accepted taxonomy is that provided by Ian Kinchin in 2000, which includes three morphological kinds. The structures are labelled 'spoke,' 'chain,' and 'net.'

Spoke-type maps

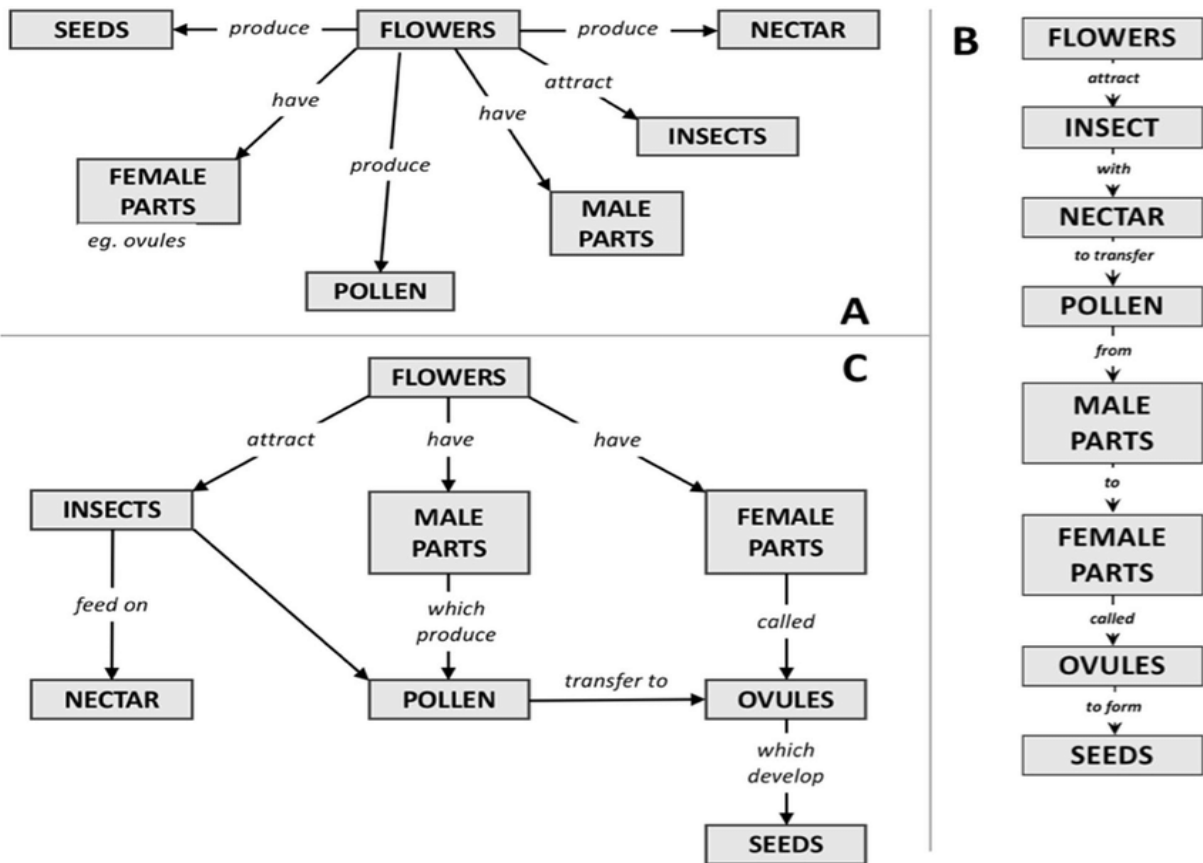
This type is uncomplicated, with a one-level hierarchy and simple links. All the related concepts of the topic are directly linked to the root idea, but not directly associated with each other. The key to this structure is the absence of cross-linkages.

Chain-type maps

The chain-type map is like a chain, comprising a series of concepts listed downwards from the broadest to the most focused. Single concepts are only associated with those items directly above and below. It is inflexible, meaning that any change in concepts or links may likely make the entire structure nonsensical and invalid.

Net-type maps

Concepts are arranged in descending order from the most general to the most detailed. However, the branches are what distinguish net-type maps. Nets comprise several hierarchies and interconnections to form a network. Each concept can be conjoined with any item at any level on the map. It is characterised by its flexibility, being unaffected by the addition or deletion of concepts.



4. Characteristics of Concept Mapping

The basic properties and components forming concept maps are:

Focus Question: the focus question is the central theme, idea, or question around which the concept map is being built. It leads the direction of the map and aids in maintaining its coherence.

Parking lot: a designated space on the concept map where a specific list is put on the side. This list contains the key ideas and concepts that may fall under the main concept and potentially help answering the focus question. It usually comprises around 15-25 concepts. Concept maps are then constructed by actively picking the relevant items from the parking lot and putting them in a specific place in the concept map.

Concepts: subjects, objects, ideas, or events, are designated by words, pictures, or symbols, etc. They are often enclosed in circles, ovals, or boxes.

Nodes: the circles or the boxes representing the concept or the idea.

Links: lines or arrows that connect concepts and represent relationships between them.

Cross-Links: cross-links are lines or arrows that connect concepts in different hierarchical branches.

Linking words or phrases: linking words/phrases, which can be verbs, adverbs, phrasal verbs, or prepositions, are distinctive connective terms placed on the lines to clearly specify the nature of conceptual relationship (between and among concepts) such as 'includes', 'refers to', 'requires', 'is caused by'.

Propositional structure: a proposition is made up of two or more concepts connected with particular linking words to form a meaningful statement or a unit of meaning.

Some examples are:

Business creates wealth.

Plants have leaves

Photosynthesis uses light energy and water that comes from the environment to form oxygen molecules.

Hierarchical Structure: concept maps often have a hierarchical structure with the main and most general concepts at the top and less- important or sub-concepts branching out below. This structure helps to organise information in a clear and systematic way.

5. Concept Map Creation:

Although concept mapping creation can be flexible, it is best to consider the following steps and general guidelines to help you create a concept map:

- 1.** Clearly define the main concept/theme/question that your concept map will address (this can be the subject of a writing task).
- 2.** On the side of the paper, and to form the parking lot, brainstorm and list out possible related concepts that will eventually fall under the main concept or help answer the focus question.
- 3.** Start creating the preliminary concept map by placing the most general, overarching concepts at the top of the map. Arrange sub-concepts and supporting details hierarchically below them.
- 4.** Use arrows and crosslinks to connect concepts and represent relationships between them. Use linking words to illustrate and describe the nature of the relationships.
- 5.** Review the map to improve the overall structure. Look for more connections and check for clarity, completeness, and coherence. Remember there is no a final version of a concept map.

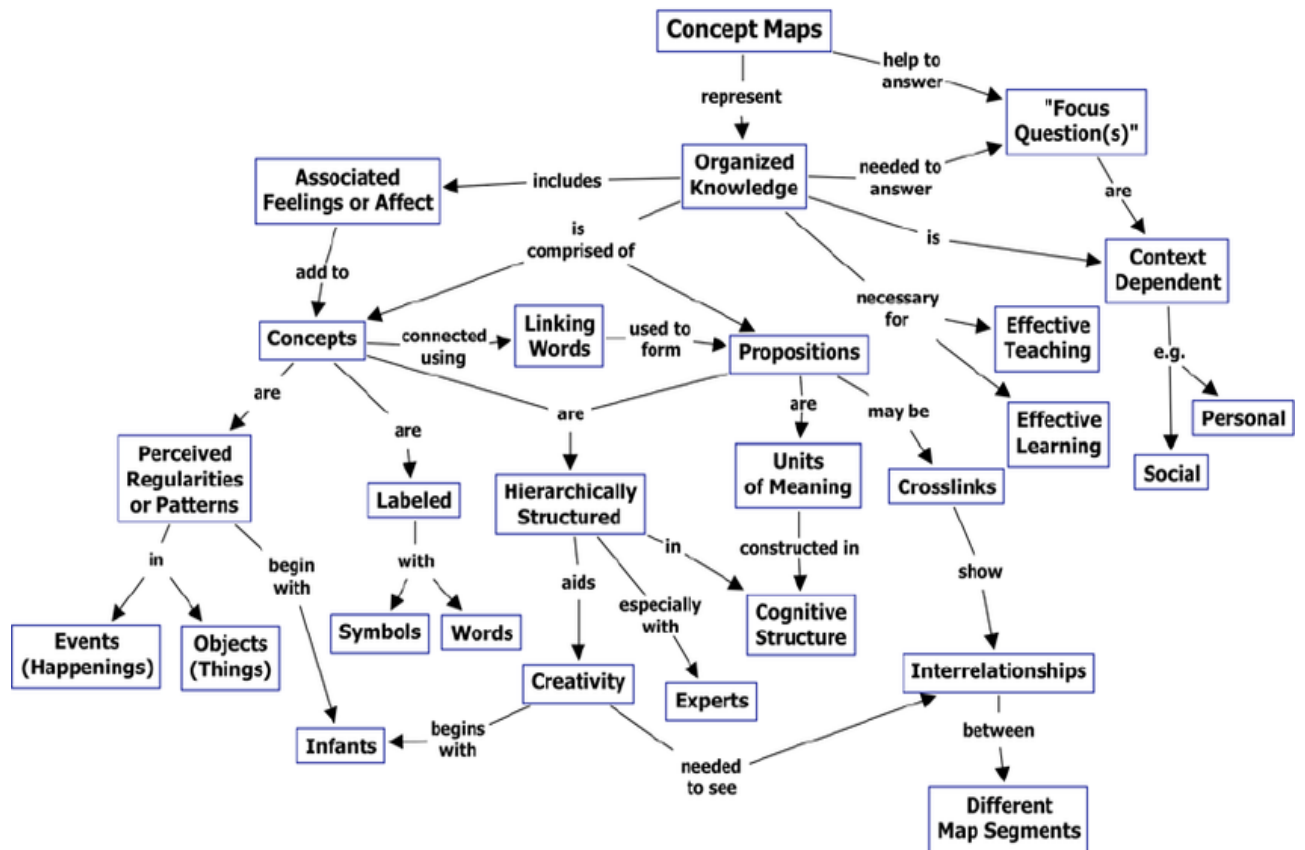
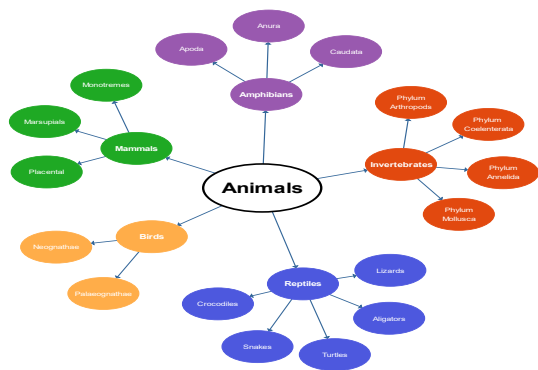
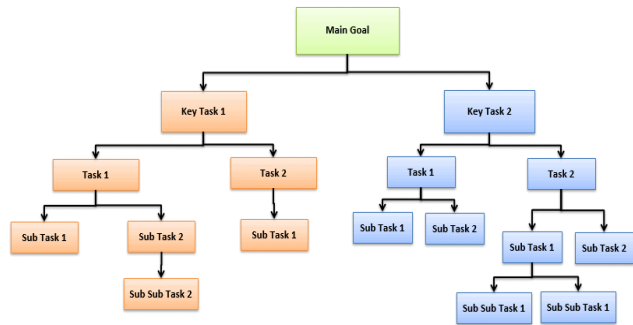


Figure 1: A concept map showing the characteristics of concept maps

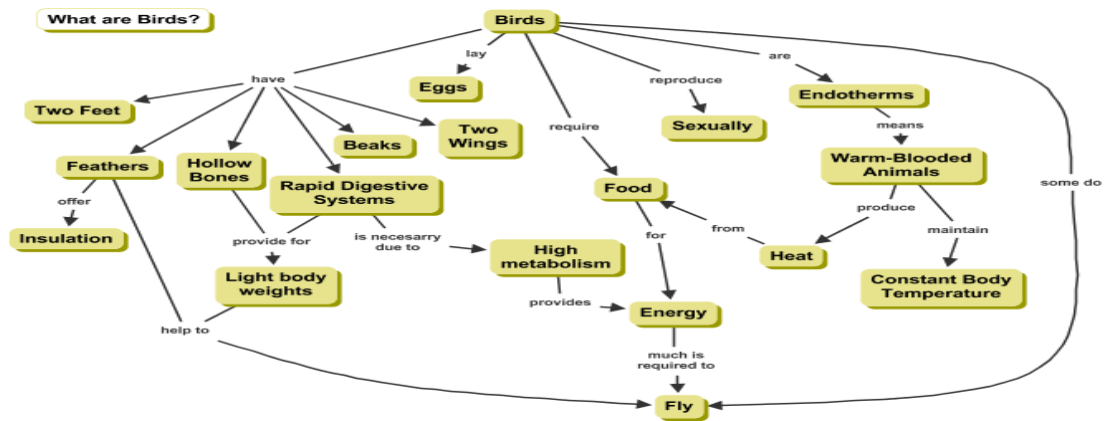
Task: among the following graphic organisers, state which ones represents concept maps.



1



2



3

Lesson 3: Practicing Concept Mapping

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, students will be able to describe and read ready-made concept maps Students will be able to finish a non-complete concept map Students will be able to complete fill-in-the-nodes map Students will be able to complete fill-in-the- map	

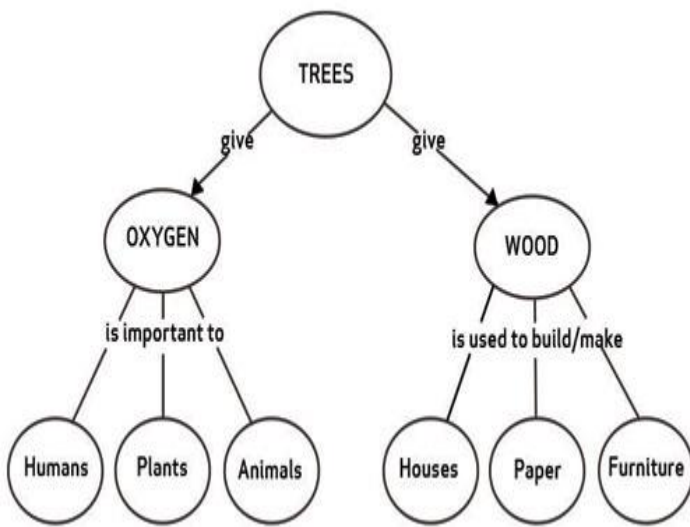
Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions, discussion • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task 1 • Task 2 • Task 3 • Task 4 	Monitoring Guiding	Do the tasks	50 min

Lesson 3: Practicing Concept Mapping

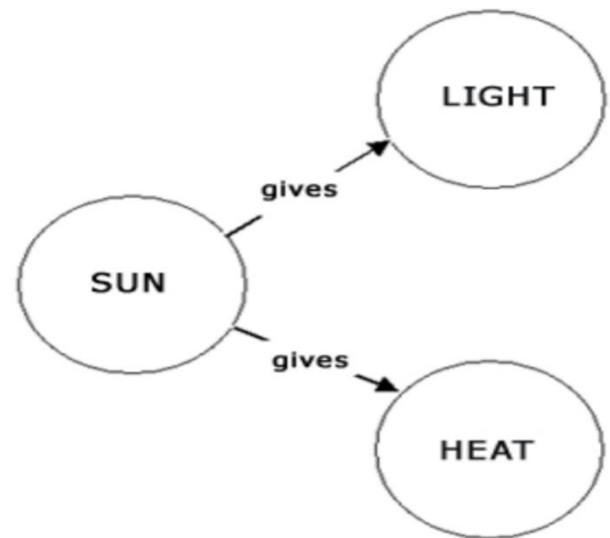
Task 1:

Depending on the topic being treated, concept maps can be either simple as in figures 1, 2 or complex as in figures 3, 4.

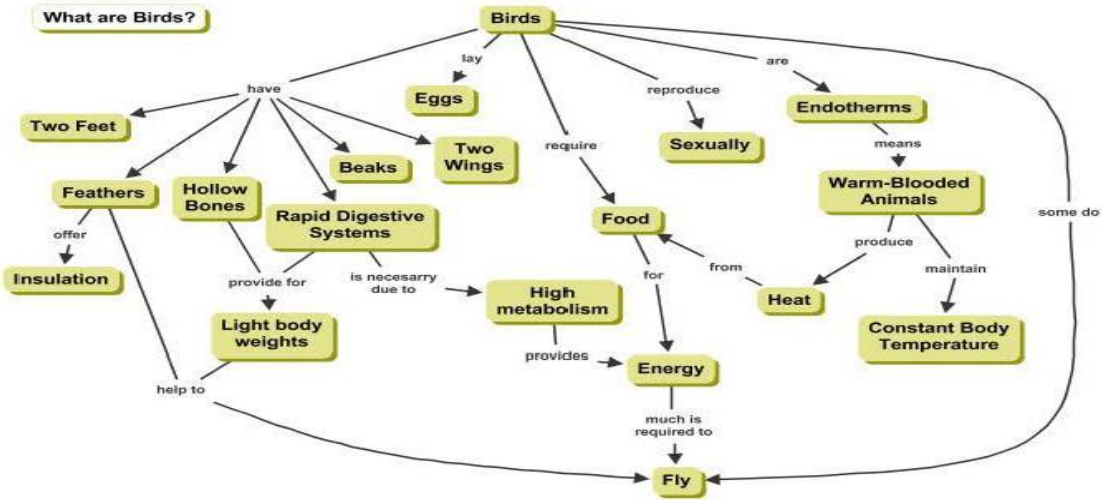
Considering the studied general characteristics of concept mapping, discuss the following concept maps in relation to structure and content.



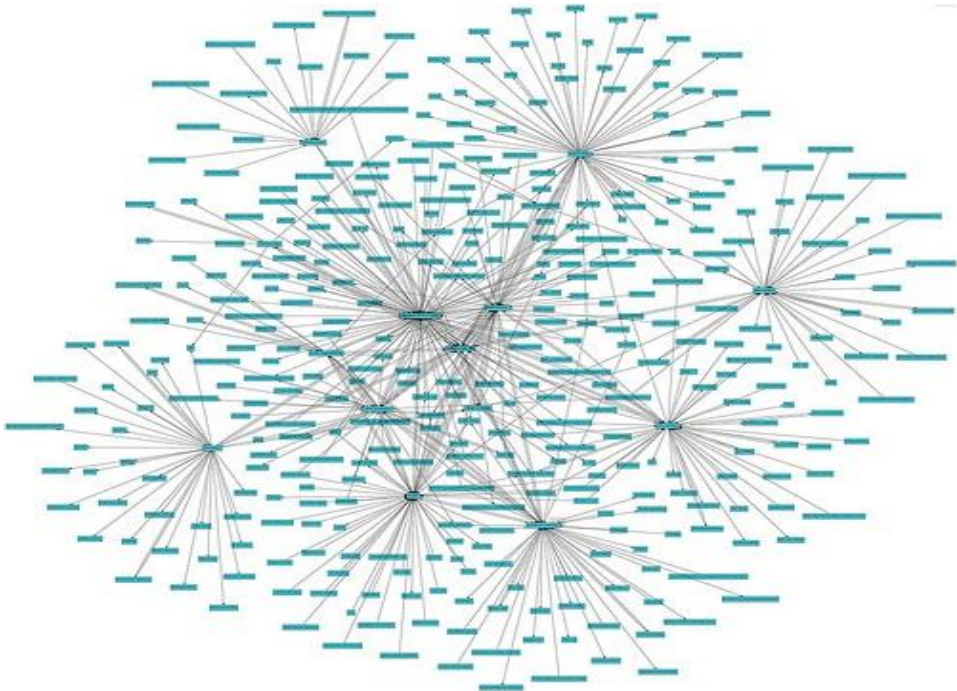
(1)



(2)



(3)

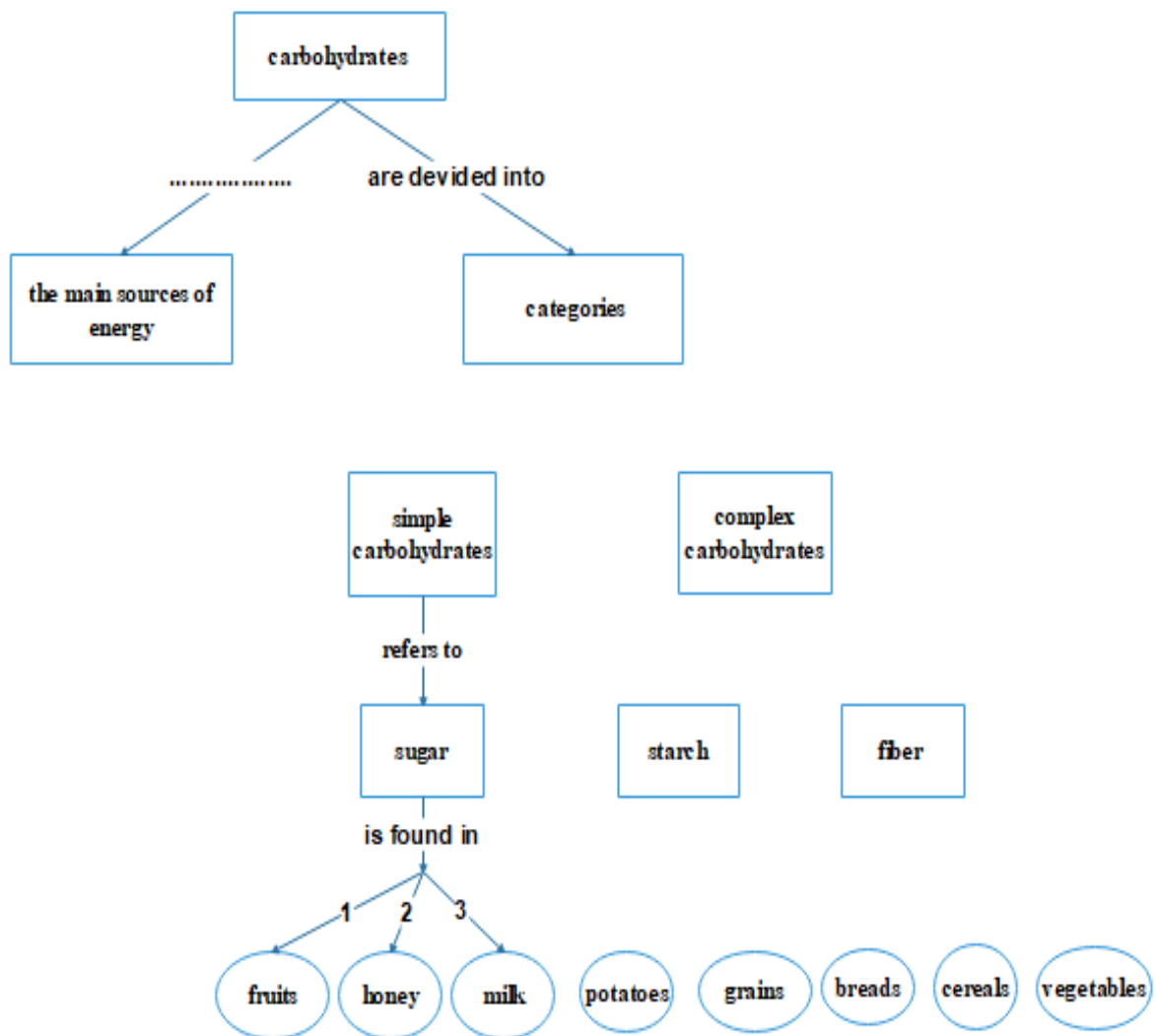


(4)

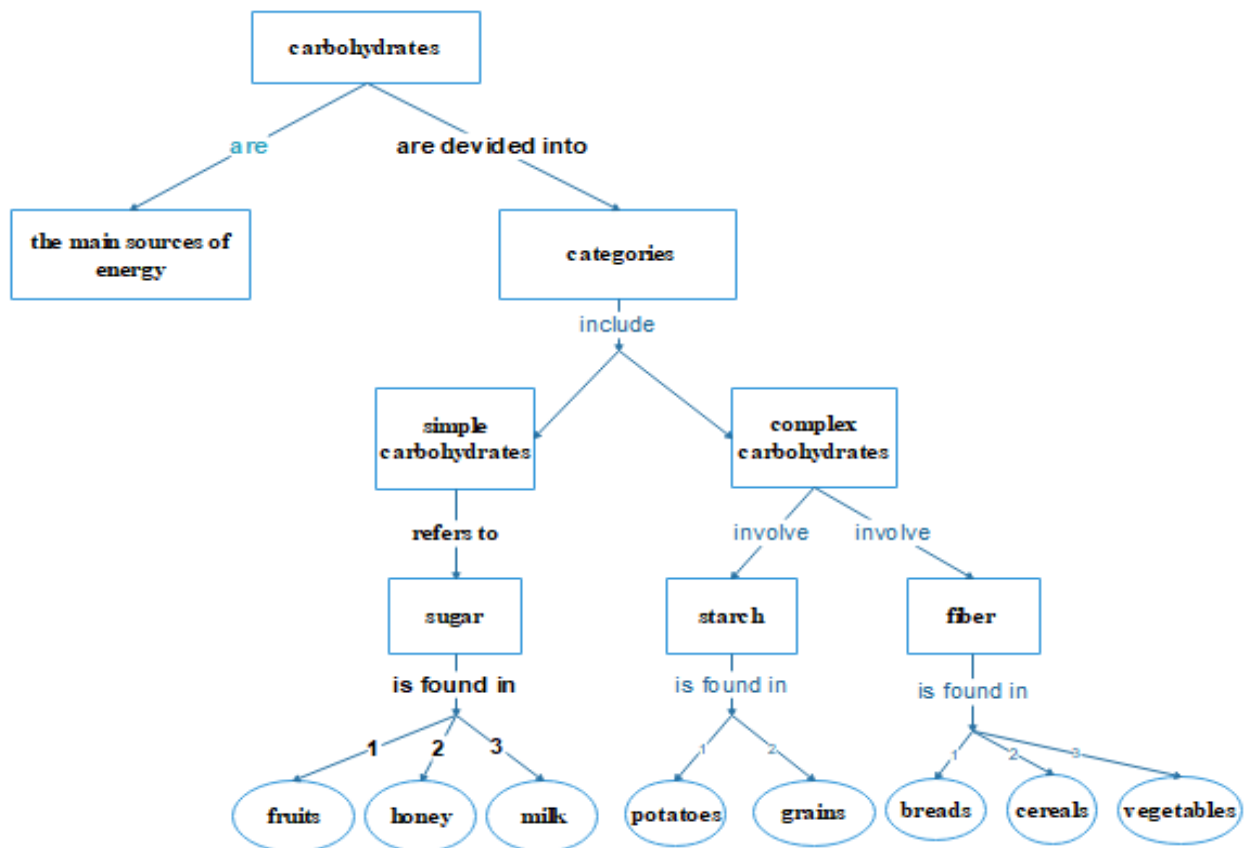
Task 2: Read the following short passage carefully and finish the concept map that follows:

Carbohydrates

Carbohydrates usually are the main sources of energy for the body. There are three different types of carbohydrates: sugar, starch, and fiber. Sugar is in fruits, honey, and milk and are also called simple carbohydrates. Starch is found in potatoes and grains, and is called complex carbohydrates. Fiber is found in breads, cereals, and vegetables, and is also called complex carbohydrates. Fiber is needed to keep the digestive system running smoothly.



The correction of practice 1



Task 3:

The fill-in-the-nodes map below summarises parts of speech.

Examine the map, the blank nodes, and the concepts provided in the parking lot.

Select the term that corresponds to each numbered blank node and write it down on the provided place. Use each term only once.

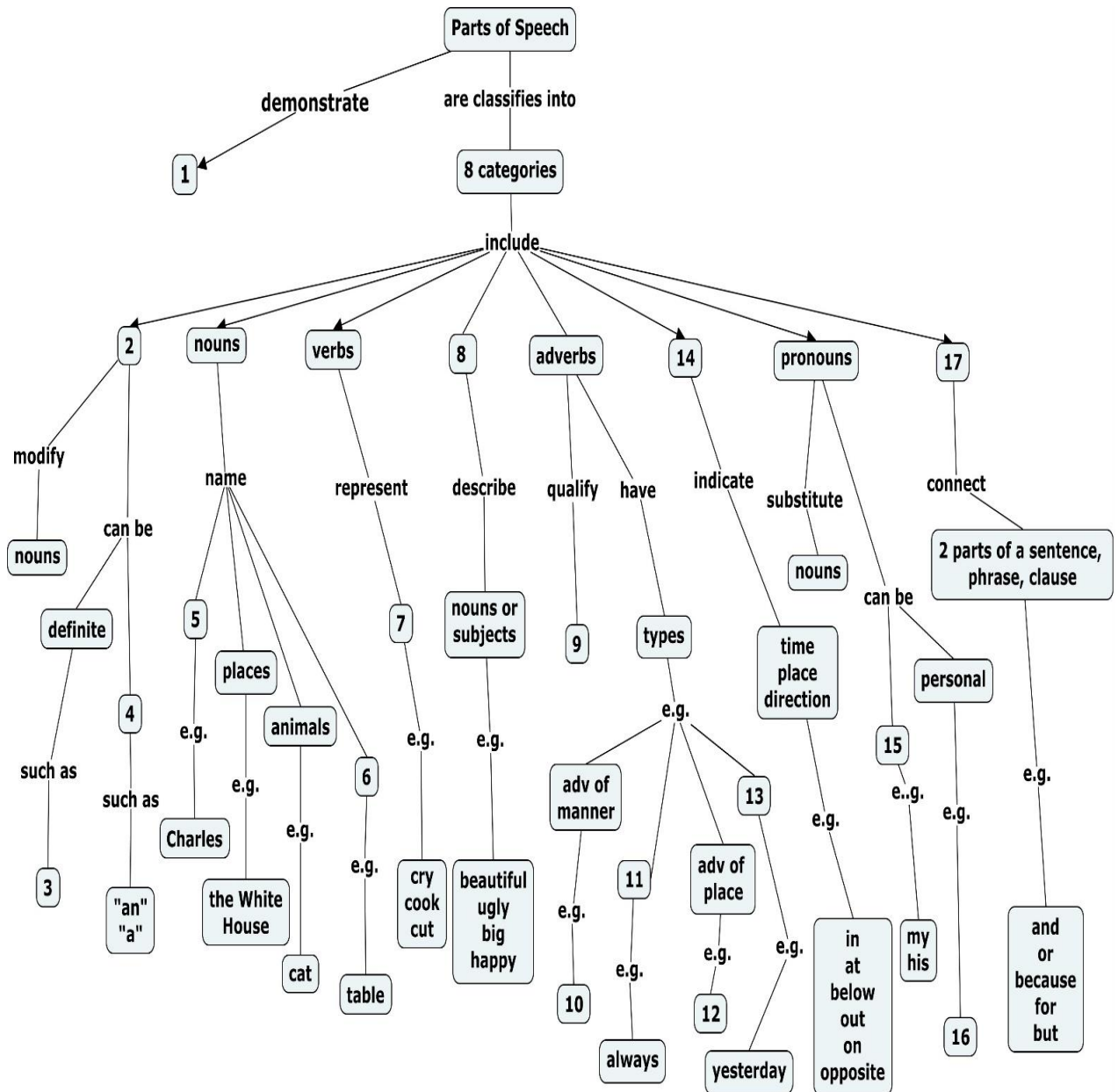
Check the map to improve the overall structure.

Parking lot

verbs
 possessive
 functions of words in a sentence
 actions
 prepositions
 she, it
 "the"
 conjunctions
 table
 people

articles often
 objects
 adv of time
 here
 reflexive pronouns
 quickly
 indefinite
 demonstrative pronouns
 adv of frequency
 adjectives

- | | |
|---------|----------|
| 1. | 10. |
| 2. | 11. |
| 3. | 12. |
| 4. | 13. |
| 5. | 14. |
| 6. | 15. |
| 7. | 16. |
| 8. | 17. |
| 9. | |



A concept map showing the parts of speech

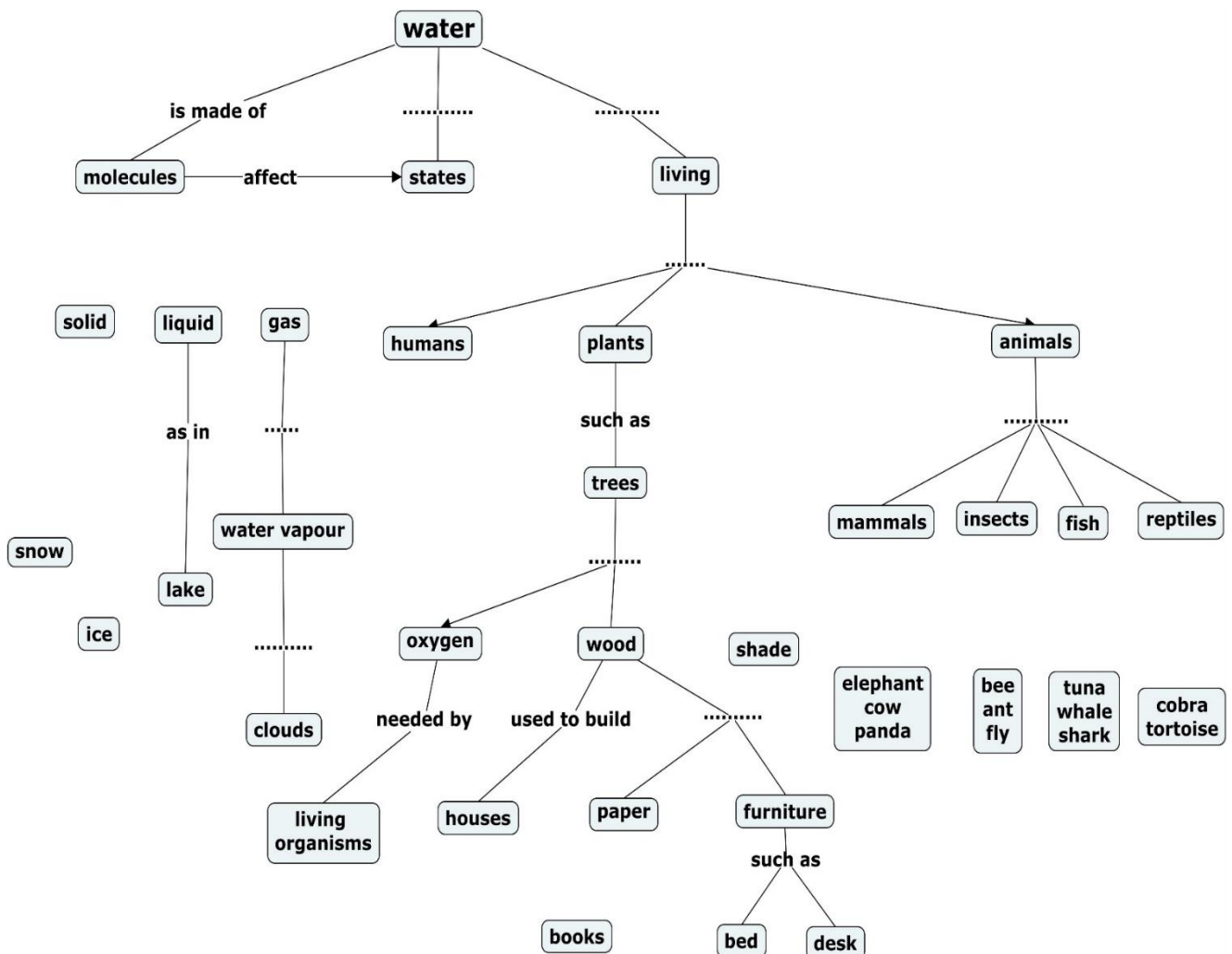
Task 4:

The fill-in-the- map bellow is about “water”. It lacks some links and linking expressions. Examine the map and fill out the required lines and linking words. You may choose from the linking words provided on the list below.

List of linking words

Changes
e.g.
provide
used to fabricate
as in

needed by
classified into
used to make
turns into



A concept map showing the concept of water

Lesson 4: Collective Concept Maps and Assessment

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, Students will be able to draw the concept map in pairs Students will be able to use the scoring rubric to evaluate the map	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions about prior knowledge • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task 	Monitoring Guiding	Do the task Follow instructions	50 min

Lesson 4: Collective Concept Maps and Assessment

Task:

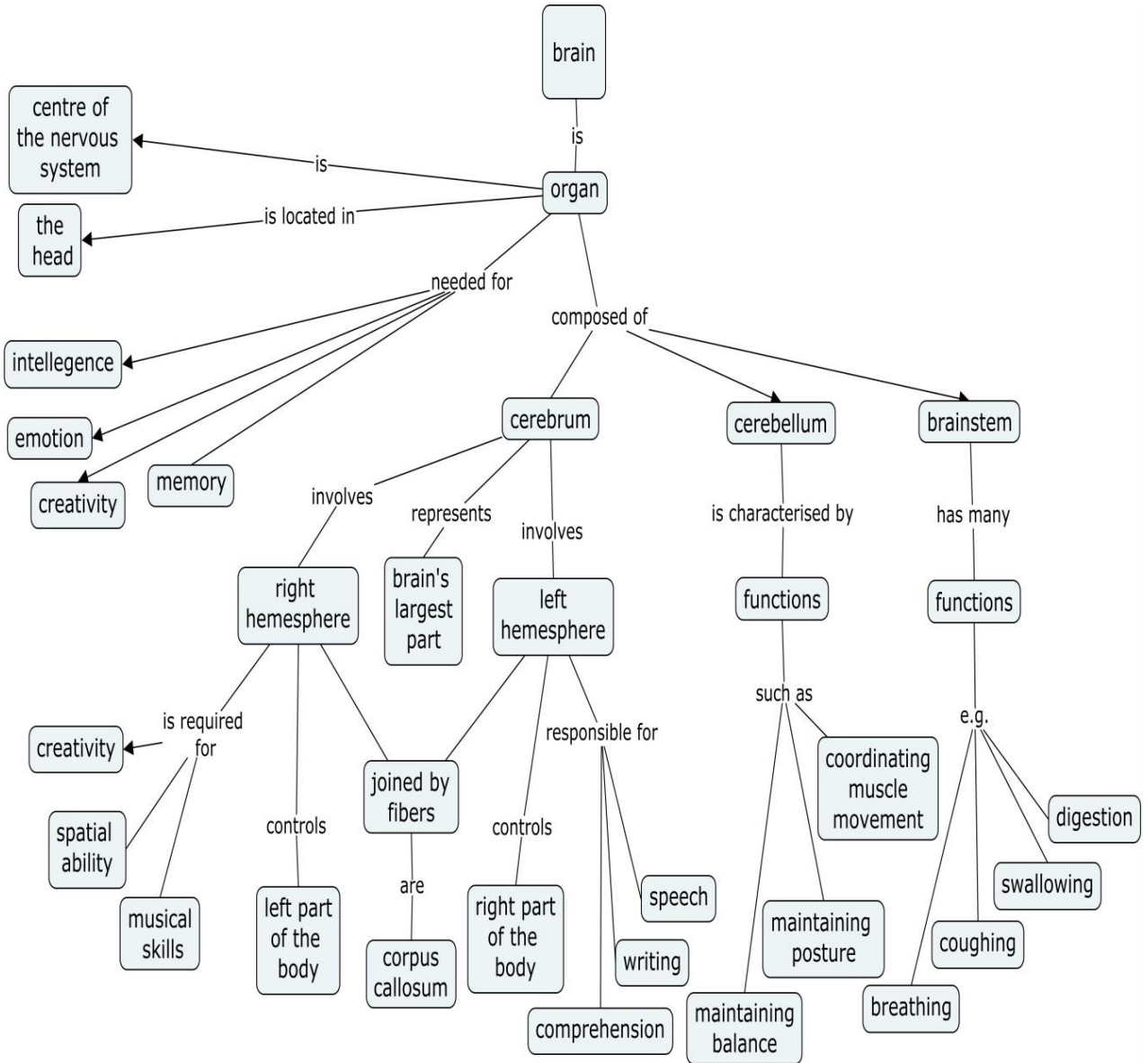
1. Read the text bellow carefully
2. Work in pairs to draw the concept map of the following passage
3. Check nodes, links, linking words, and overall structure
4. To get the final concept map score, share the constructed map with other pair of students and assess it using the provided scoring rubric.

Text:

Brain

The brain is an organ that serves as the centre of the nervous system. It is located in the head. It controls all functions of the body, interprets information from the outside world. The brain governs intelligence, creativity, emotion, and memory. The brain is composed of the cerebrum, cerebellum, and brainstem. **Cerebrum:** is the largest part of the brain and is composed of right and left hemispheres. **Cerebellum:** is located under the cerebrum. Its function is to coordinate muscle movements, maintain posture, and balance. **Brainstem** performs many automatic functions such as breathing, heart rate, body temperature, wake and sleep cycles, digestion, sneezing, coughing, vomiting, and swallowing. The cerebrum is divided into two halves: the right and left hemispheres. They are joined by a bundle of fibers called the corpus callosum that transmits messages from one side to the other. Each hemisphere controls the opposite side of the body. In general, the left hemisphere controls speech, comprehension, and writing. The right hemisphere controls creativity, spatial ability, and musical skills.

Possible answer



The Concept Map Rubric

The characteristic	The mark
Concepts	1 point for each correct, meaningful concept
Links	1 point for each correct, meaningful connecting line
Linking words	1 point for each correct, meaningful linking word
Hierarchy	5 points for each correct, valid hierarchical level
crosslinks	10 points for each correct meaningful crosslink

The characteristic	The possible mark		
	5 points	3 points	1 point
Organisation	<ul style="list-style-type: none"> • Organised • The reader is able to follow and understand what is written. 	<ul style="list-style-type: none"> •Somehow organised •Sometimes the reader is not able to follow what is written 	<ul style="list-style-type: none"> •Not organised •the reader cannot follow what is written
Spelling/grammar	No errors	1-2 errors	3 or more errors
The degree of understanding the topic.	Shows an understanding of the topic	shows a few understandings of the topic	Shows no understanding of the topic

Lesson 5: Concept Maps and Prior Knowledge

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, Students will be able to activate prior knowledge to generate a concept map based on a prompt (question) Students will be able to use the scoring rubric to evaluate the map	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions about prior knowledge • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task 	Monitoring Guiding	Do the task Follow instructions	50 min

Lesson 5: Concept Maps and Prior Knowledge

Task:

- a. Do you know what the five human senses are?
- b. Construct a concept map that represents what you already know about the five senses (your prior knowledge).
- c. Depend on the following short passage to expand on and elaborate your concept map.
- d. Using the marking grid presented by the teacher, correct your classmate's final concept map.

The Five Human Senses

Humans experience the world through the five senses: sight, hearing, taste, touch, and smell. The eyes, which consist of many parts such as the cornea, pupil, and lens, allow us to see colours and shapes. The ears help us to hear sounds and enjoy music. The ear has four main parts: the outer ear, the eardrum, the middle ear, and the inner ear. The sense of taste allows to taste foods with the tongue, which is a muscular organ helping in chewing, speaking and breathing. With the skin, we can feel textures and the warmth of sunlight. Additionally, the nose helps to smell different scents, from the aroma of flowers to the smell of food. These senses work together to create our rich and diverse sensory experience.

Lesson 6: From Text to a Concept Map

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, students will be able to draw a simple concept map based on the information provided in a passage	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions about prior knowledge • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task • Homework 	Monitoring Guiding	Do the task Follow instructions	50 min

Lesson 6: From Text to a Concept Map

Task:

Sponges

Sponges are classified as animals because they do not make their own food. Though they have different shapes and sizes, they lack a number of animals characteristics such as muscles, nerves, circulatory system, and internal organs. Sponges are made of four types of cells. The first are the collar cells. These cells help to bring oxygen and nutrients to the sponge while also removing waste and carbon dioxide. The second cells are the porocytes. The latter make up the pores of the sponge. Epidermal cells, however, form the skin on the outside of the sponge. Finally, the amoebocytes, which constitutes the final type of sponges, help in transporting nutrients. Importantly, they usually work with usually work together with the collar cells.

Questions

1. Read the text carefully
2. Based on the information provided in the passage, draw a comprehensive concept map that describes the topic.
3. Check the nodes, links, linking words, and overall structure.

Homework

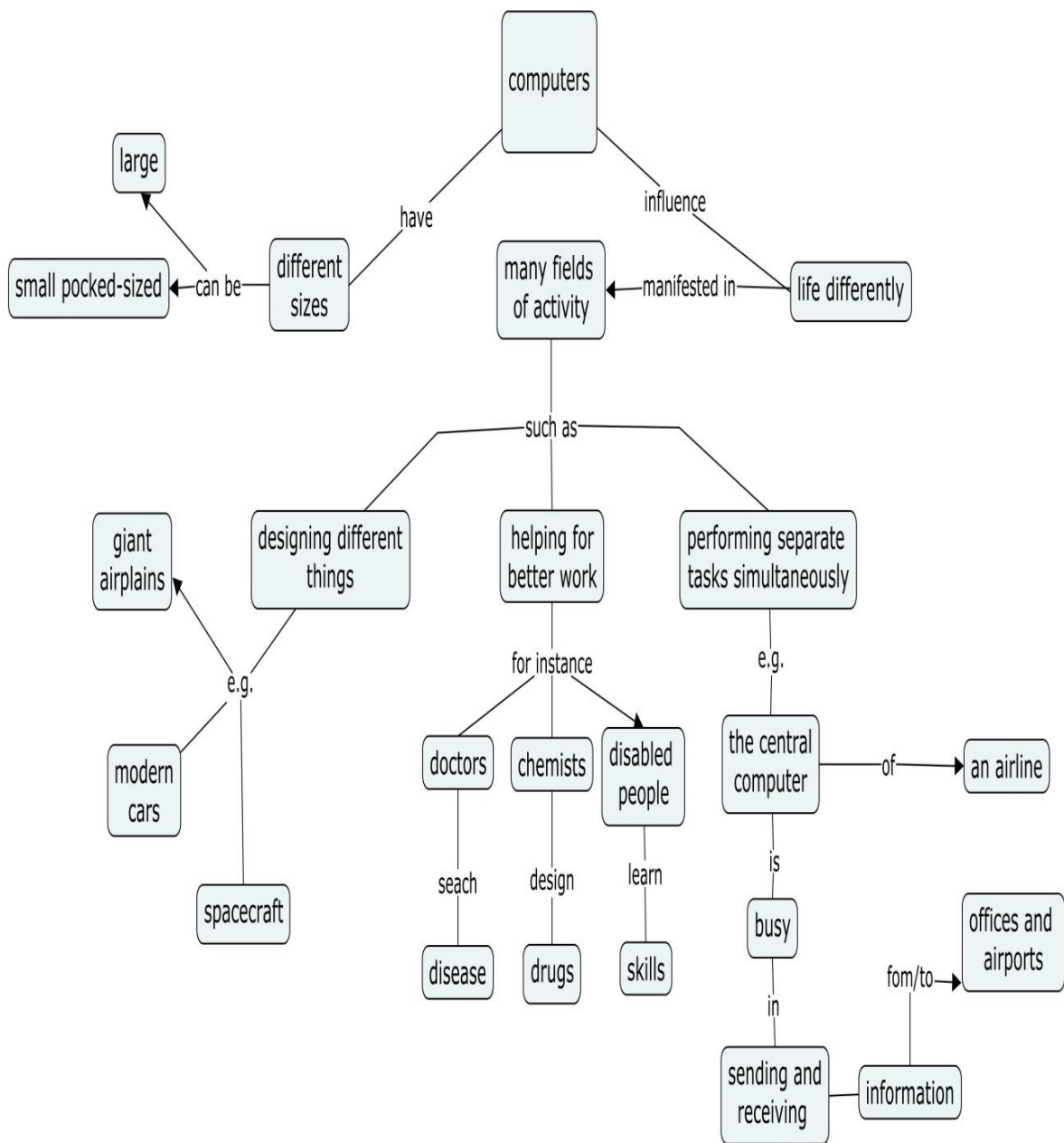
What is a computer

Computers are changing all over lives and also old ways of doing things with their superhuman speed. They come in different sizes from very large to small pocket-sized ones. They can always be used in any field of activity. No one can deny their influence and importance. Computers are used to design different things. They are used in giant airplanes and modern cars. All spacecraft which are orbiting out through space are controlled by computers. In addition to helping us to work better, computers are opening new fields of endeavour. Perhaps the most important is in medicine where computers are helping doctors to research disease, chemists to design drugs and disabled people to learn skills. Furthermore, computers can also be programmmed to do many separate tasks at the same time. The central computer of an airline, for example, is constantly busy sending and receiving information to and from offices and airports around the world.

Questions:

1. Use a parking lot to generate ideas about your prior understanding of what computers are
2. Drawing on your ideas, construct a preliminary computer-related concept map
Read the text carefully
3. extend your concept map by incorporating necessary information from the text into it to enrich its content
4. Based on the final concept map, write a short paragraph in your own words describing the brain and its parts (you are not allowed to copy and paste from the text)

Possible answer



Lesson 7: From a Concept Map to Text

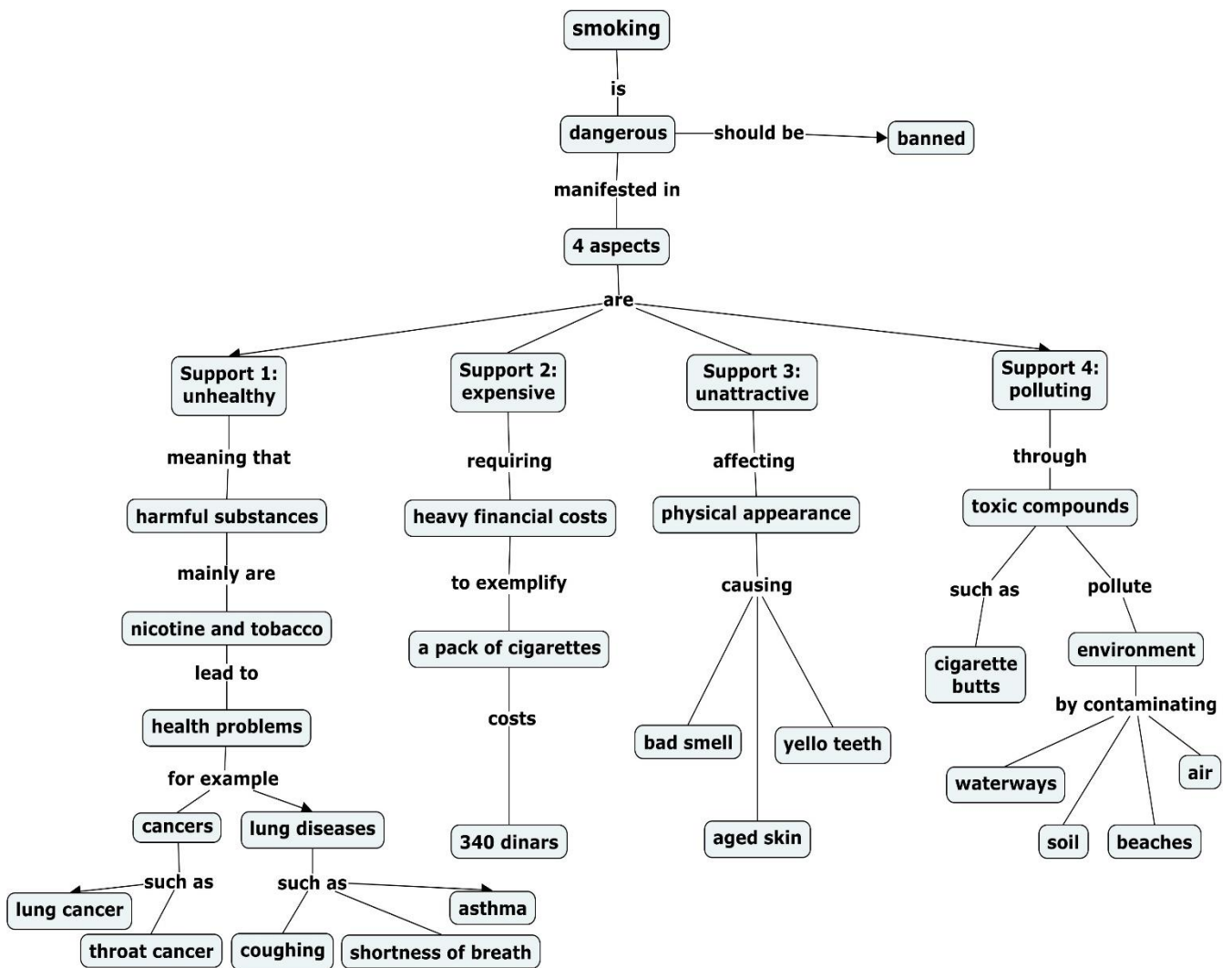
Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, students will be able to write a comprehensive paragraph based on already constructed concept maps	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> • Warm-up: Asking questions about prior knowledge • Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task 	Monitoring Guiding	Do the task Follow instructions	50 min

Lesson 7: From a Concept Map to Text

Task:

Write a short paragraph on why smoking should be banned. Use the supporting ideas and examples provided in the concept map below. Choose three arguments.



Possible answer**Smoking**

Smoking is widely recognized as a dangerous practice that should be banned for a number of reasons. To begin with, smoking is unhealthy. Due to its harmful substances, such as nicotine and tobacco, smoking can cause various health problems. It can cause different types of cancers, such as lung cancer and throat cancer. Cigarettes have also a major impact on the lungs, causing coughing, shortness of breath, asthma, and bronchial infections. Smoking increases the risk for heart attack because it damages blood vessels. Furthermore, smoking is expensive. It entails heavy financial costs. A pack of cigarettes costs 340 dinars. If you bought one pack of cigarettes every day, you would spend over 124.100 dinars each year. Next, smoking affects physical appearance. Cigarettes smell bad. When people smoke, you can smell the cigarettes on their clothes all day. They also give yellow teeth and aged skin. Lastly, smoking effects our environment. In addition to the fact that smoking is harmful to people, it actually harms the ecosystem with all of its inhabitants. Toxic compounds of cigarettes, such as the cigarette butts and other elements of smoked cigarettes tend to pollute waterways, soil, and beaches. To sum up, smoking should be illegal for it being is unhealthy, expensive, unattractive, and polluting.

Lesson 8: Independently-Constructed Concept Maps

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third-year. Groups 7
Resources: Handouts, board.	
Lesson objectives: At the end of this session, students will be able to write a short paragraph on the basis of their independently-constructed concept maps	

Headings + content	Teacher activity	Student activity	Time
<ul style="list-style-type: none"> •Warm-up: Asking questions about prior knowledge •Introducing the session's objectives to students. 	Asking questions	Answering and discussion	10 min
<ul style="list-style-type: none"> • Task •Task 	Monitoring Guiding	Do the task Follow instructions	50 min

Lesson 8: Independently-Constructed Concept Maps

Task 6:

Draw a concept map about sports and their importance in daily life.

Based on the constructed map, write a short paragraph on sports and their importance in daily life.

You can use the following prompts:

Improves physical fitness (weight control)

Strengthens immunity

Encourages social interaction

Improves self-confidence

Lower cholesterol levels

Boosts energy

Strengthens muscles and bones

Reduces stress and depression

Building relationships

Improve blood circulation

Promotes better sleep

Task 7:

Construct a concept map to map out and brainstorm supporting ideas and examples about the importance of reading books on academic success.

Use your concept map to write a short paragraph on the importance of reading books on academic success.

Session: The Posttest

Lecturer's name: HENOUDA Meriem	
Course: Written Expression	Duration: 1 h
Topic: Lesson Planning	Level: Third Year. Group 7
The pretest objectives: The pretest will be administered in an attempt to assess any significant improvement in students' writing performance after the use of the concept mapping strategy	

Posttest Correction:

The collection of the posttest paragraphs of student were thoroughly reviewed and accurately assessed by the two raters using the same writing analytical scoring rubric, which was adapted from Jacobs et al's 1981 scale (as cited in Weigle, 2002).

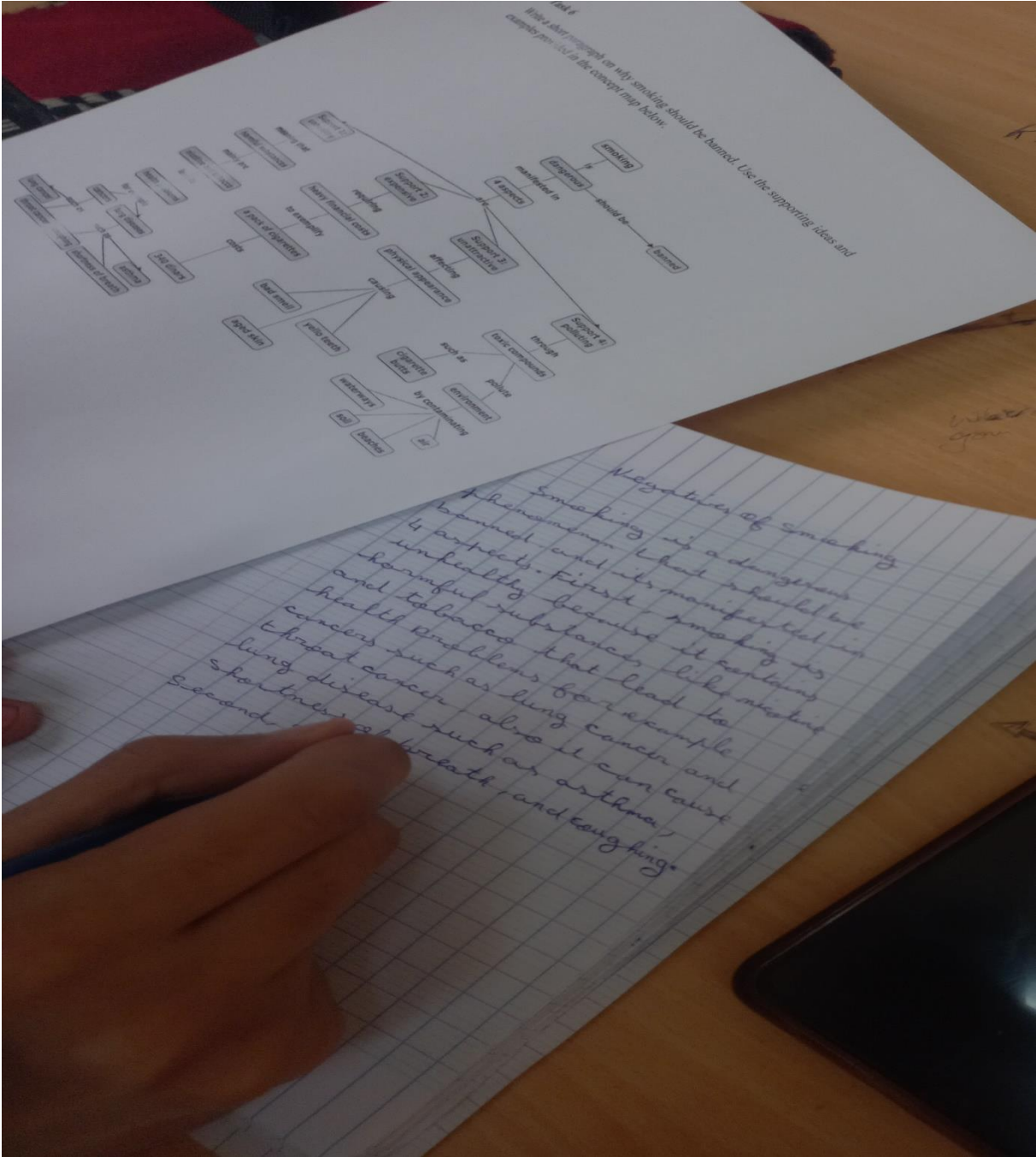
Appendix 14: Concept Mapping Scoring Rubric

The characteristic	The mark
concepts	1 point for each correct, meaningful concept
Links	1 point for each correct, meaningful connecting line
Linking words	1 point for each correct, meaningful linking word
Hierarchy	5 points for each correct, valid hierarchical level
crosslinks	10 points for each correct meaningful crosslink

The characteristic	The possible mark		
	5 points	3 points	1 point
organisation	<ul style="list-style-type: none"> • Organised • The reader is able to follow and understand what is written. 	<ul style="list-style-type: none"> • Somehow organised • Sometimes the reader is not able to follow what is written 	<ul style="list-style-type: none"> • Not organised • the reader cannot follow what is written
Spelling/grammar	No errors	1-2 errors	3 or more errors
The degree of understanding the topic.	Shows an understanding of the topic	shows a few understandings of the topic	Shows no understanding of the topic

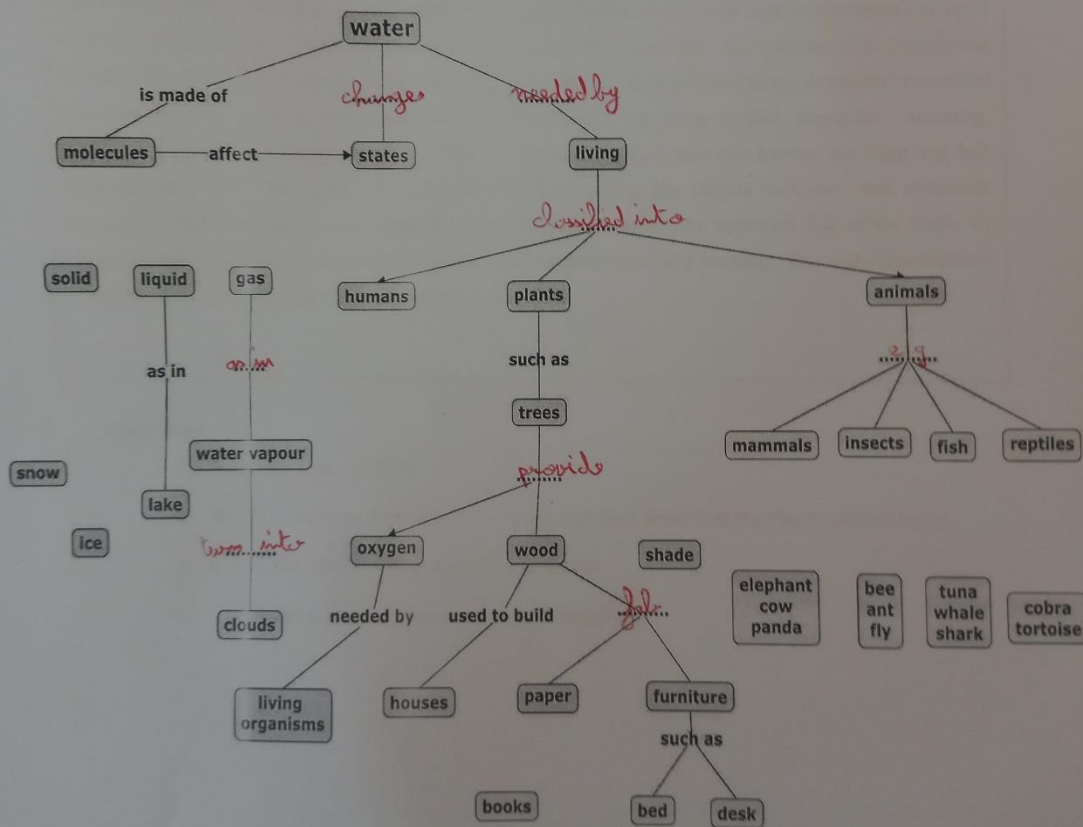
Appendix 15: Pictures about the Treatment Administration





List of linking words

- Changes
- e.g.
- provide
- used to fabricate
- as in
- needed by
- classified into
- used to make
- turns into



A concept map showing the concept of water

Appendix 16: Samples of Student Paragraphs in Pretest

..... There are many effects of online learning on student achievement.....

..... First, online learning is not good for student achievement because ^{they} less discipline.....

..... Also online learning help to loss interaction and cause health issues.....
..... online learning use in every thing (like) in study when you don't know about a topic or idea and it not best in time.....
..... the student can't learn from there houses.....

..... in addition of online learning sometimes when student learn they can't consent that in his study and they can't take any idea about what they learn.....

..... Finally, learning online it have a good and bad effects for student achievement.....

..... Nowadays, Learning methods have developed in a way that helps students to learn such as "Online learning". As it has positive effect on some of them it has also negative for others.

..... In One hand, Online learning is effective and helpful for students who are auditory learners because they base on listening to the teacher more to get information, and as a result the majority of them succeeded in getting high marks and achieved a good level by just using Online learning.

..... In the hand, we have students who do not like online learning and they are imaginary learners who learn by taking notes and looking to the teacher, they prefer to attend the sessions in class to feel comfortable while learning and also for those who have a lot of noise in their houses such as kids etc., they do not prefer online courses, and in covid 19's period their level decreased and they could not achieve the level they used to have.

..... In conclusion, it depends on the learner's way of learning concerning online courses, so we can not say that it is good for all learners and we need to let them chose the learning method that helps them.

.....

.....online learning helps learners to find.....
any questions that they need, and also helps them
to study any course that they need to achieve their
goals in the future.....

but what is the effect of it in learning on
student achievement?.....

..it has a bad and good effect but now we talk
about negative effects.....

- it can cause the student a bad vision in their
eyes by ~~the~~ watching online courses by phone or
by pc and they not wear medical glasses.....
now we talk about positive effect, it can be
effect on students and they will have a good mark
on the subject that they need to learn.....

.....

.....

.....

.....

.....

.....

with the presence of the internet and social media spread.
COVID-19. This makes online learning to university
in great a more positive effect in student is
facilitate communication between student
and teacher, also like student working
facilitate

the
like ~~an~~ strategy "online learning" has
effects on students achievement, but let
me say it has a big major impact on
them.

first it can be challenge for maintaining self discipline,
students activities can't be monitored like in school; it can be
a challenge for tutors so they lose ~~self~~ their self discipline.

second for managing groups it's difficult to manage
various people at one time in online classes.

also it affects health issues on students. online
studies can give you some health issues like headaches
eyesight or ~~a~~ a lot of other illnesses from an early
age.

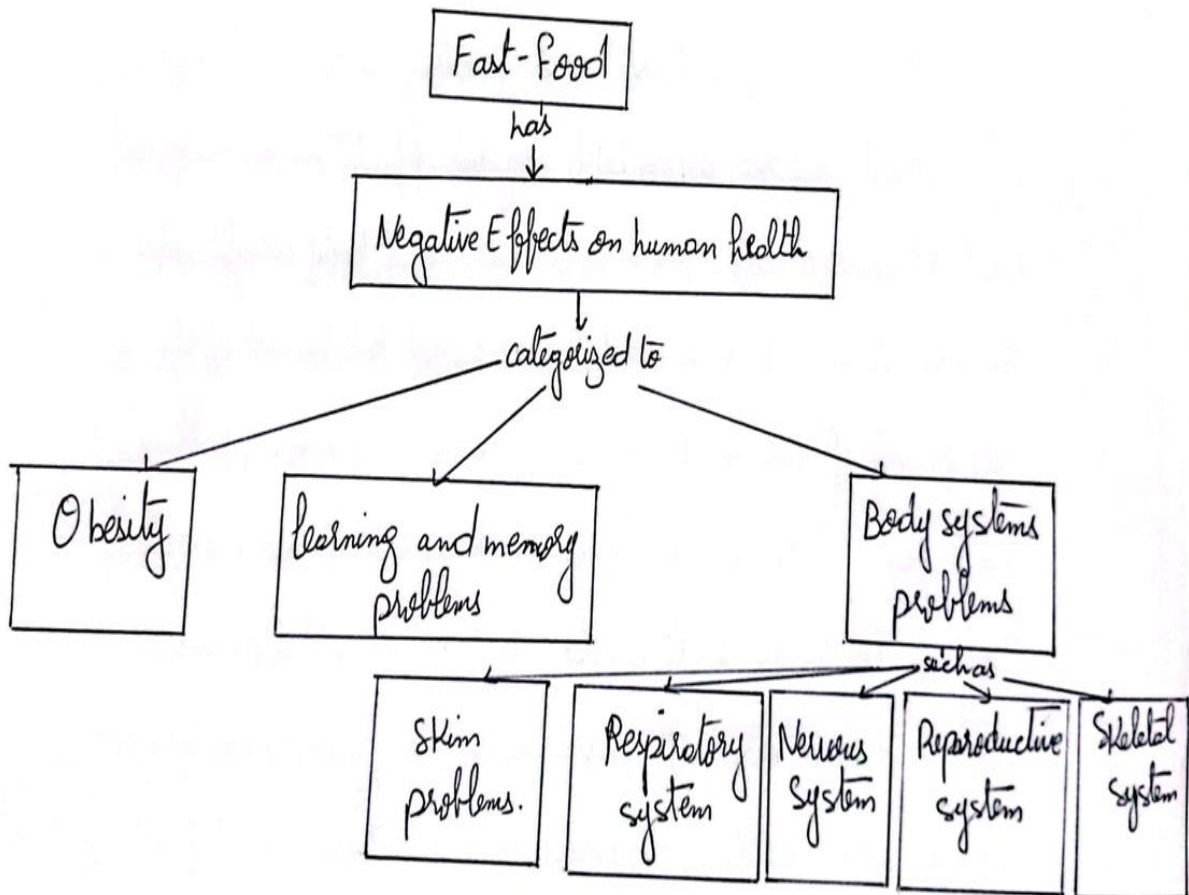
and the lack of physical ~~active~~ movement so
it leads to laziness passiveness and dependence
on others.

in conclusion I don't support the
online learning because of the previous
reasons.

Appendix 17: Samples of Posttest Paragraphs and Corresponding Maps

Concept Map 1

Concept map of Fast-food Effects on human health.



Paragraph 1

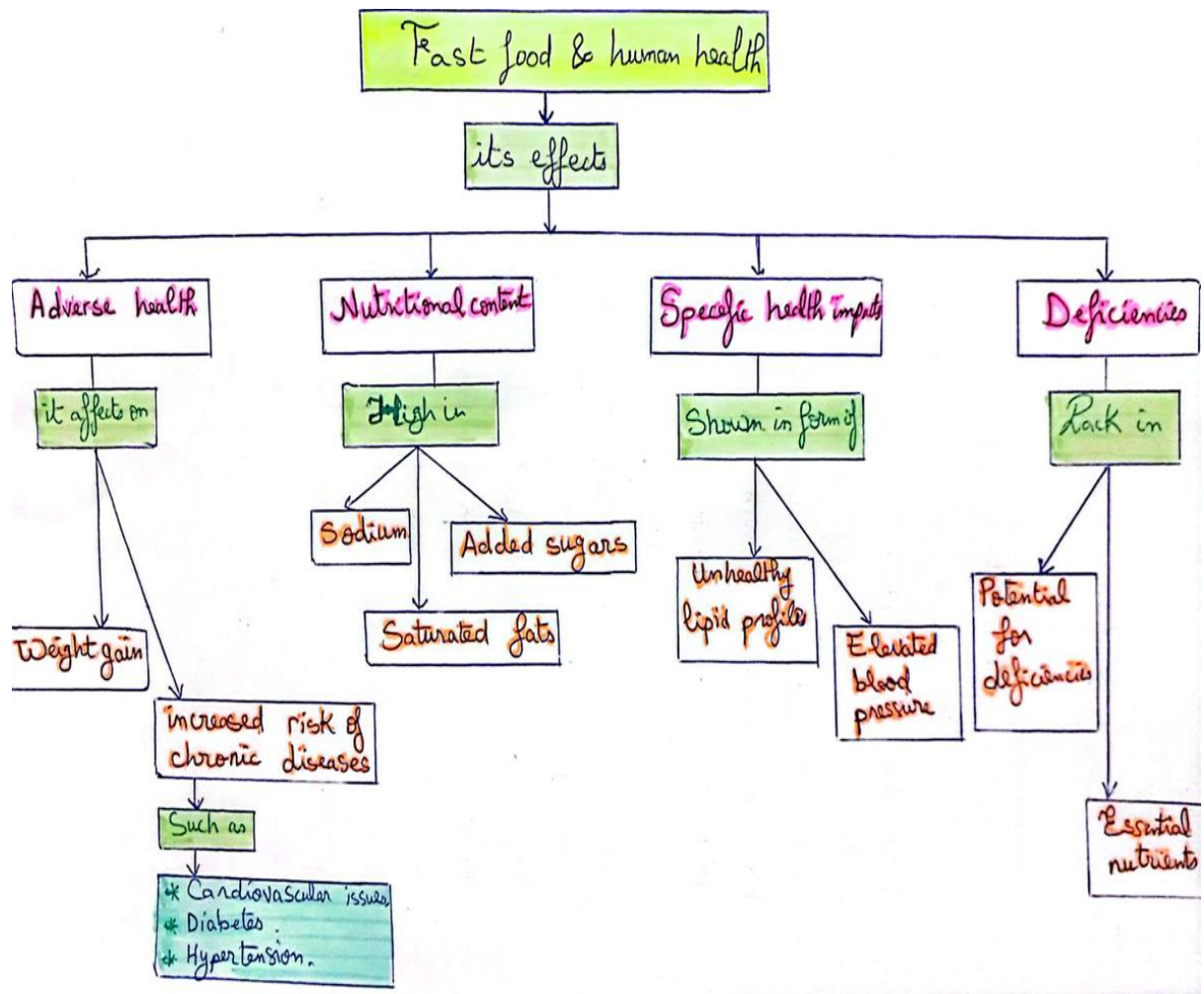
.....Fast Food Effects.....

.....Fast food has uncountable negative effects on human health. First, it causes Obesity, which is the increase of body weight, and the more the one eats fast-food the more he gets fat, because of the big quantity of fats on it. Second, learning and memory problems, eating fast-food makes the brain lose his power to work regularly because there is no healthy colors and proteins and vitamins on fast-food reach it, so the person became less focus, specially for children, who their learning skills decrease. Third, fast-food estampedes the body systems, such as: respiratory system, Nervous system, Reproductive system, Skeletal system, in addition to skin problems which annoy most of people. To conclude with, Fast-food is not the type of food that people can depend on, because it has no benefits on their health.....

.....

.....

Concept Map 2



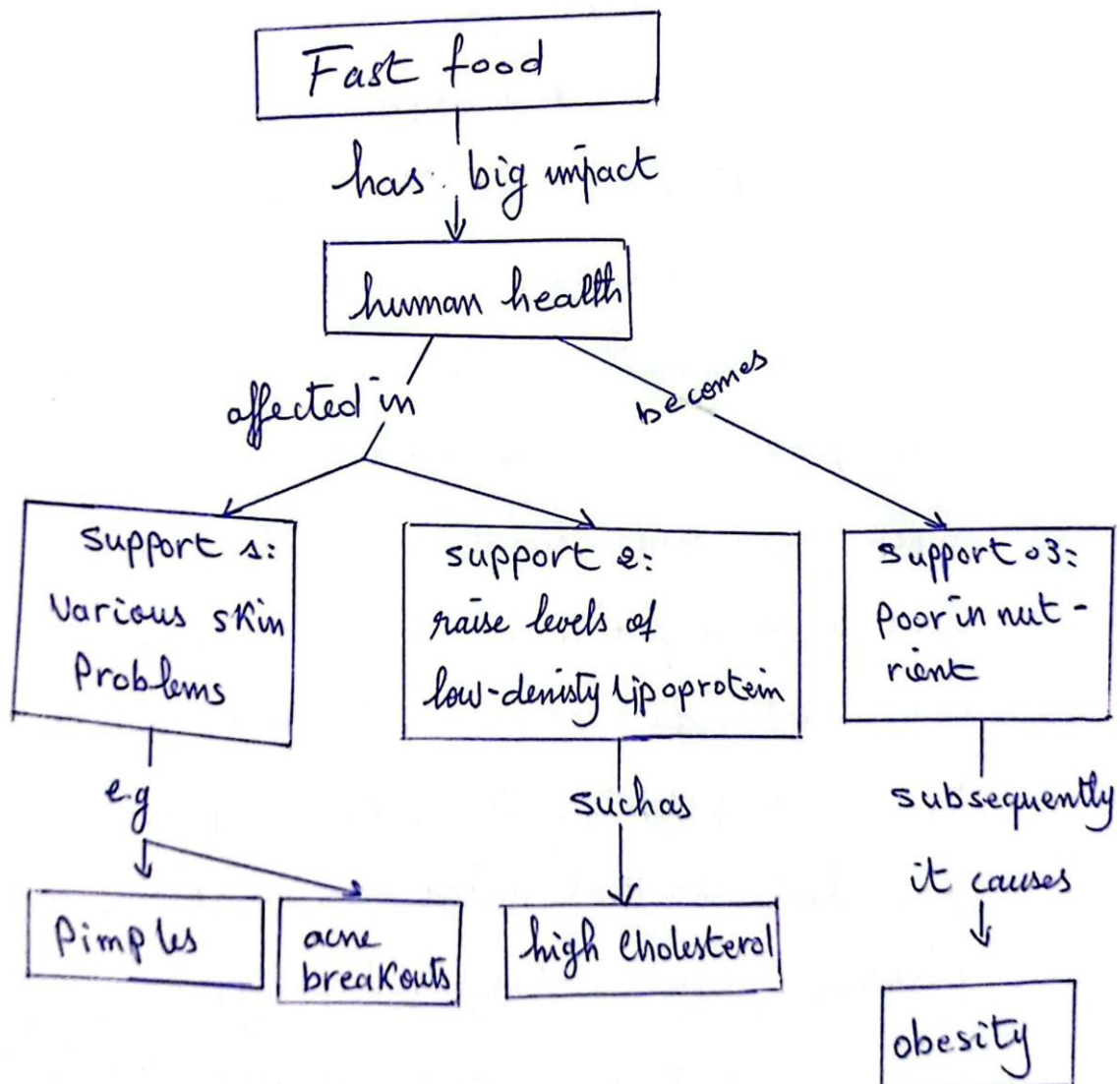
Paragraph 2

The effects of Fast food on human health

The pervasive consumption of fast food has been linked to a range of adverse effects on human health. Regular intake of these convenient but often nutritionally poor meals has been associated with weight gain, increased risk of chronic diseases such as cardiovascular issues, diabetes, and hypertension. Fast food tends to be high in saturated fats, sodium, and added sugars, contributing to unhealthy lipid profiles and elevated blood pressure levels. Additionally, the lack of essential nutrients in fast food may lead to deficiencies, affecting the overall well-being. Despite its widespread popularity, it is crucial to be mindful of the potential health implications associated with frequent fast food consumption, as making informed dietary choices is paramount for long-term health.

Concept Map 3

What are the effects of fast food on human health?

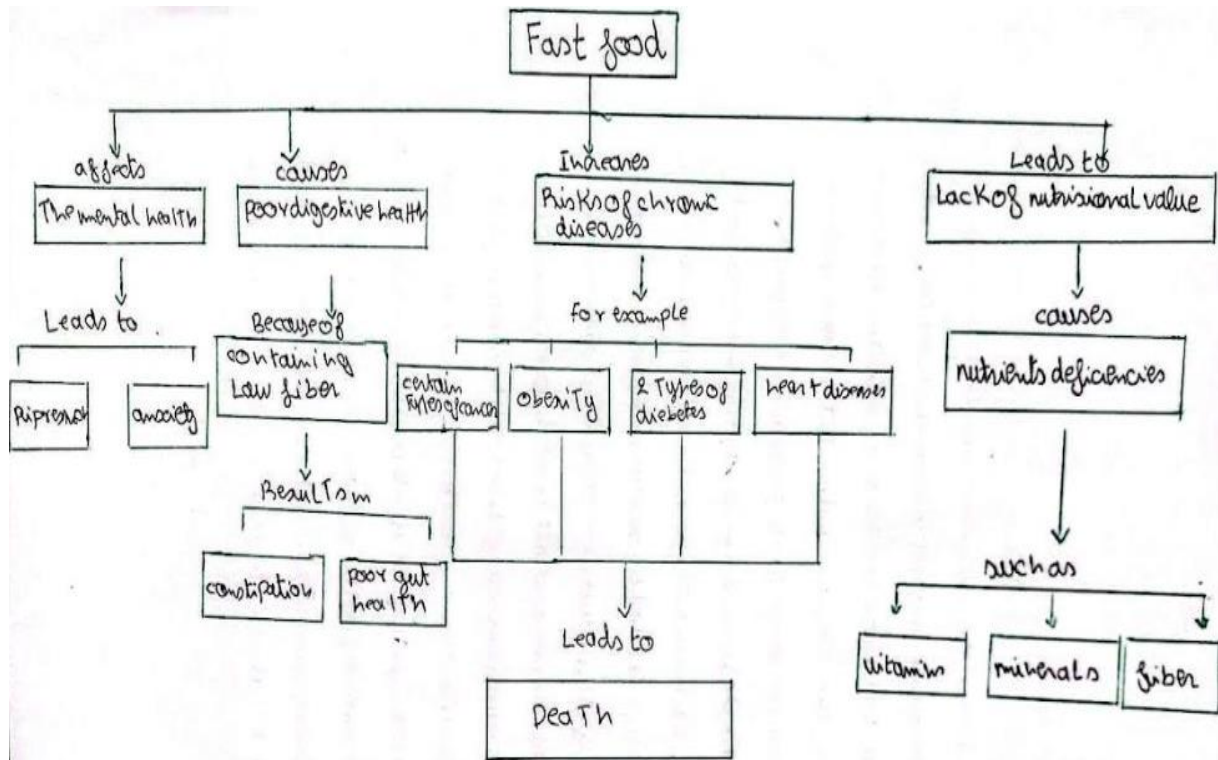


Paragraph 3

..... Effects of fast food on human health.....

..... Fast food has a big impact on.....
..... human health. First, it can cause various.....
..... skin problems. For example, pimples appear.....
..... in the face or the body, acne break outs. Second,
..... fast food can raise the levels of low-density.....
..... lipoprotein "bad" cholesterol. Finally, it's.....
..... considered a food rich in energy and poor.....
..... in nutrient. As an example, it ~~which~~ leads.....
..... to the risk of obesity. In conclusion, fast.....
..... food has risks that include: Various skin.....
..... problems, high cholesterol and obesity.....

Concept Map 4

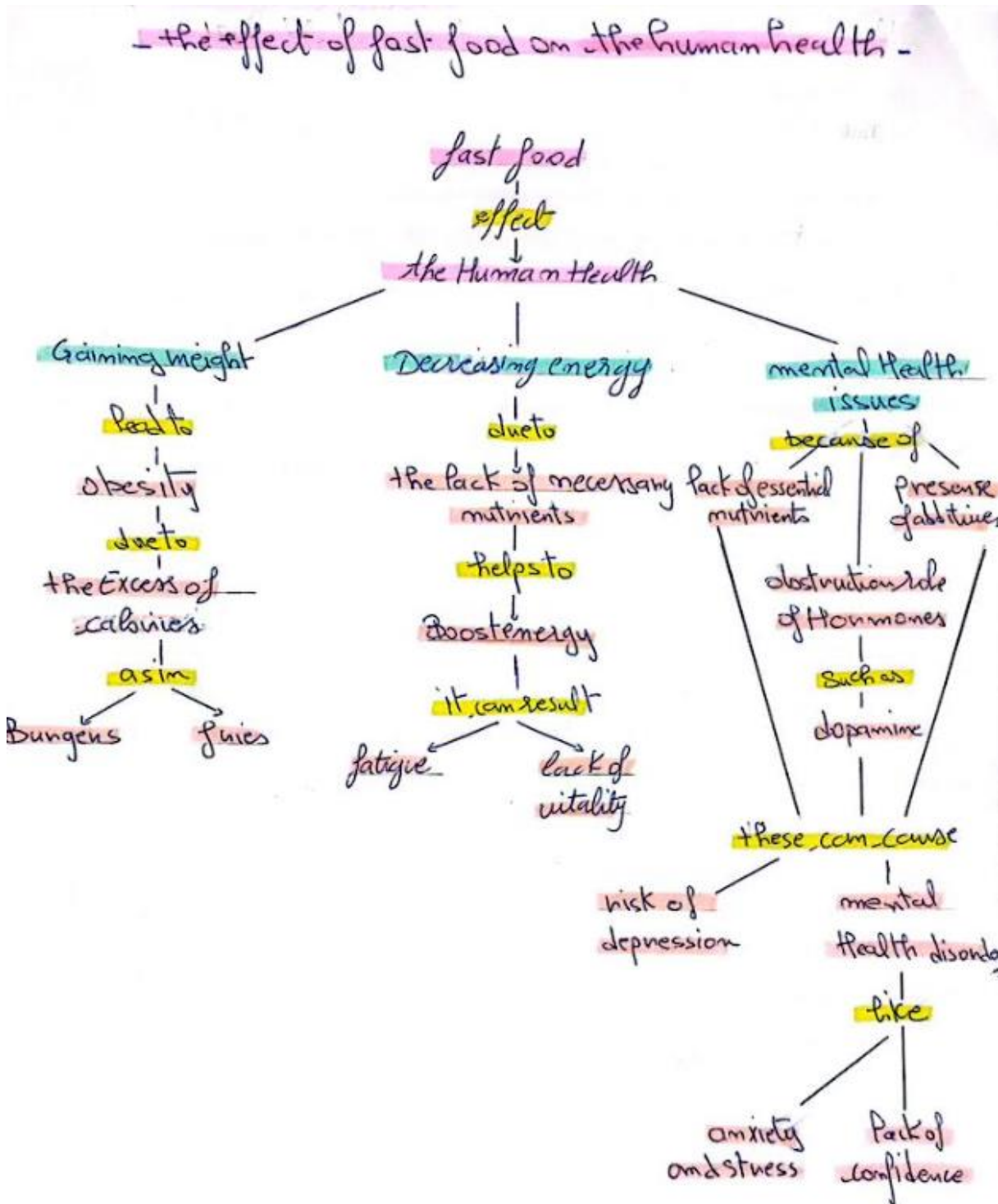


{ A concept map about the effects of fast food on human health }

Paragraph 4**{ The effects of fast food on human health**

..... It is believed that the frequent consumption of fast food can have a negative impact on human health, first fast food in general leads to the lack of nutritional value in our nutrition, the essential nutrients that our bodies need to function properly, fast food cannot offer and this can lead to deficiencies in vitamins, minerals and fiber. Second, it increases the risks of chronic diseases. It has been always linked to serious dangerous diseases such as obesity, type two diabetes, heart disease and certain types of cancer and all these diseases can lead to death. Third, it causes a poor digestive health, because fast food is low in fiber and this can lead to issues such as constipation and poor gut health, finally, it affects badly the mental health. It increases the risks of getting depression and anxiety. In conclusion, always remember that it's important to strive for a balanced diet that includes a variety of whole healthy food.

Concept Map 5



Paragraph 5

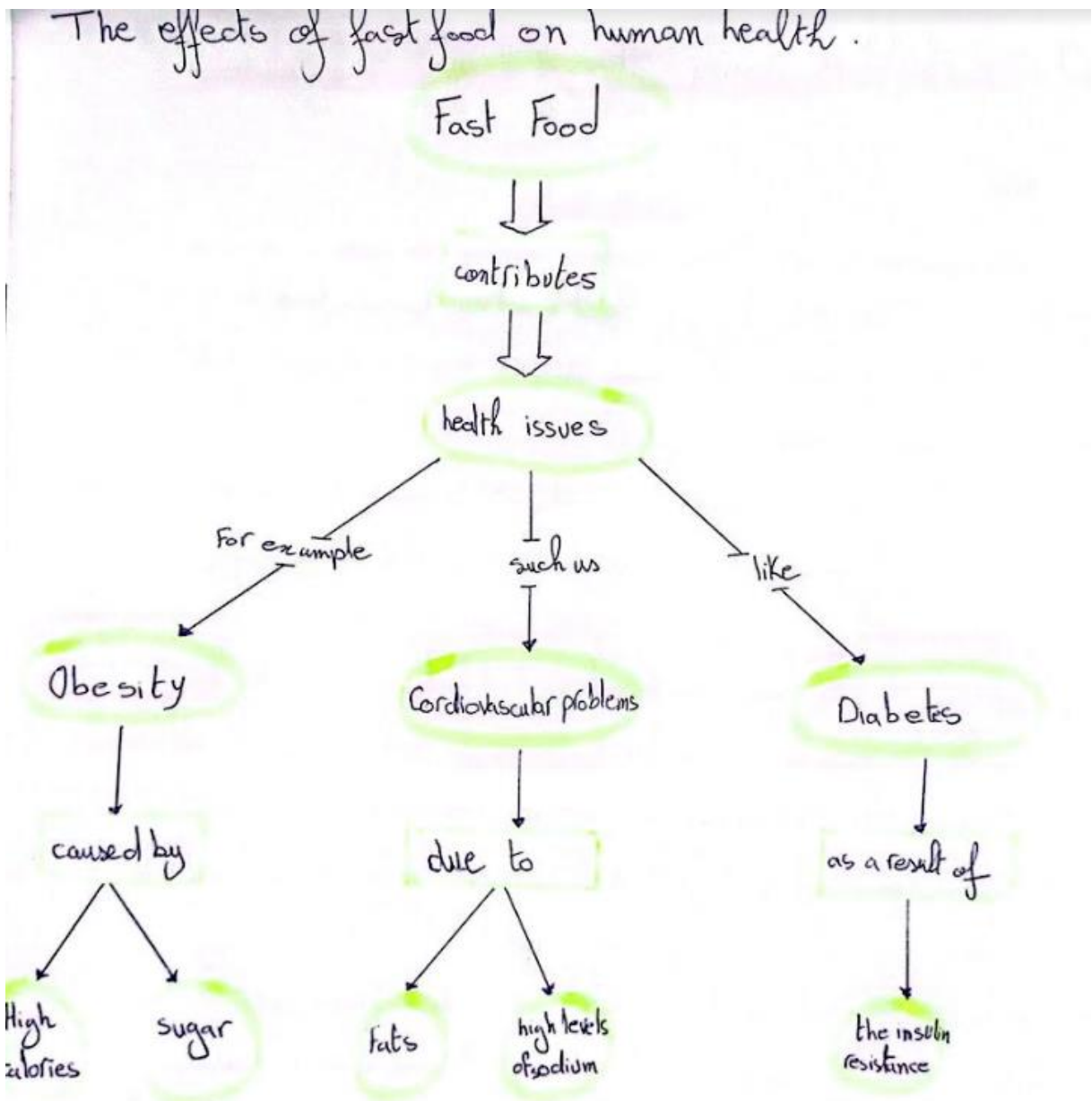
- The effect of fast food on human health -

The human health can be affected by fast food in many ways. First, fast food can cause weight gain leading to overweight and obesity due to the excess of calories in the human body as in burgers and fries. Second, it might decrease your energy due to the lack of necessary nutrients which helps in boosting your energy, and it can result fatigue and lack of vitality. Third, junk food can be the reason for mental health issues because of the lack of essential nutrients, presence of additives, and the obstruction role of hormones like dopamine, these can cause the risk of depression and diverse other mental health disorders such as anxiety, stress, and lack of confidence. To sum up, balancing fast food consumption by a rounded nutrient dense diet is essential for maintaining a good health and to prevent these negative effects.

.....

.....

Concept Map 6

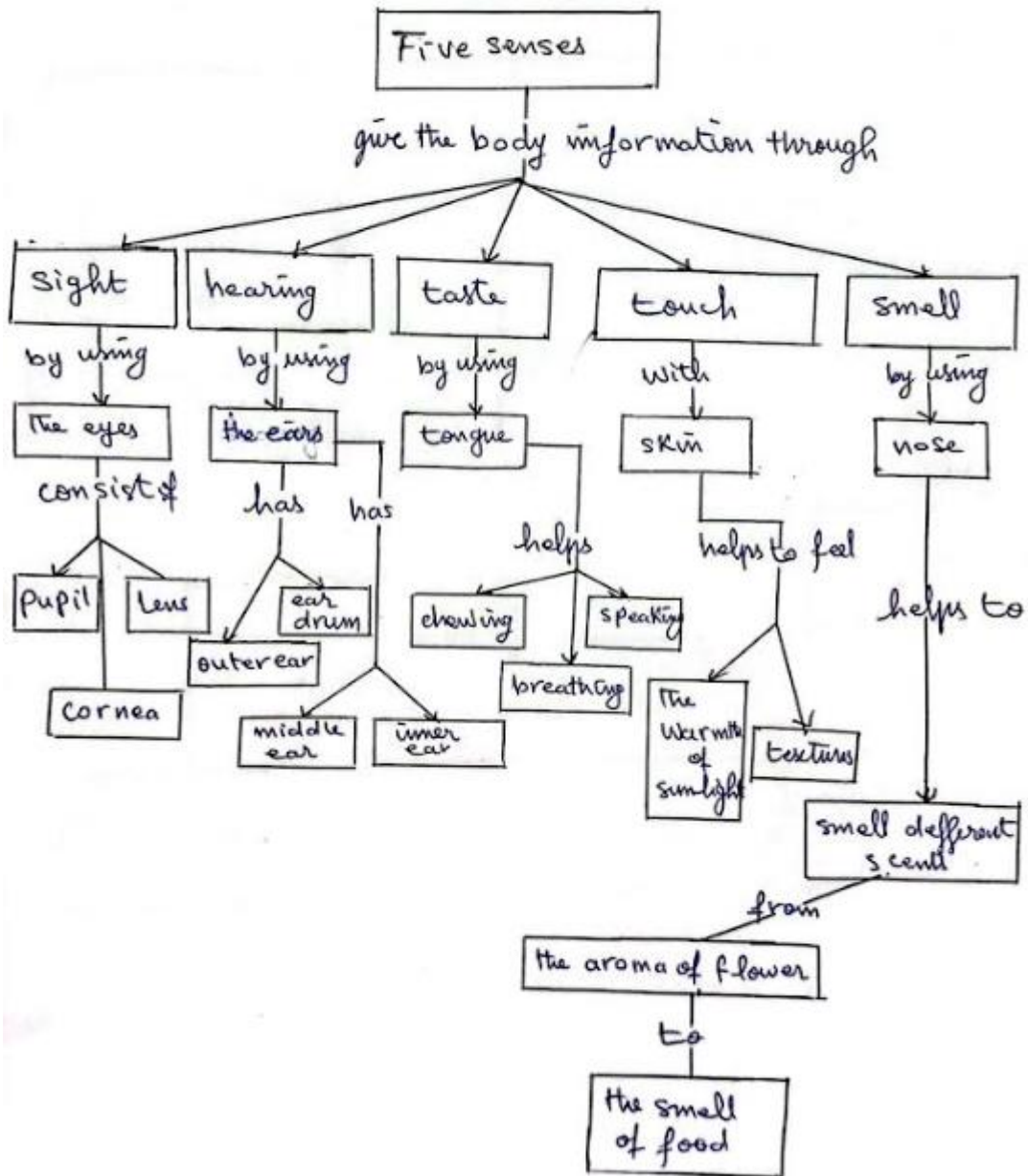


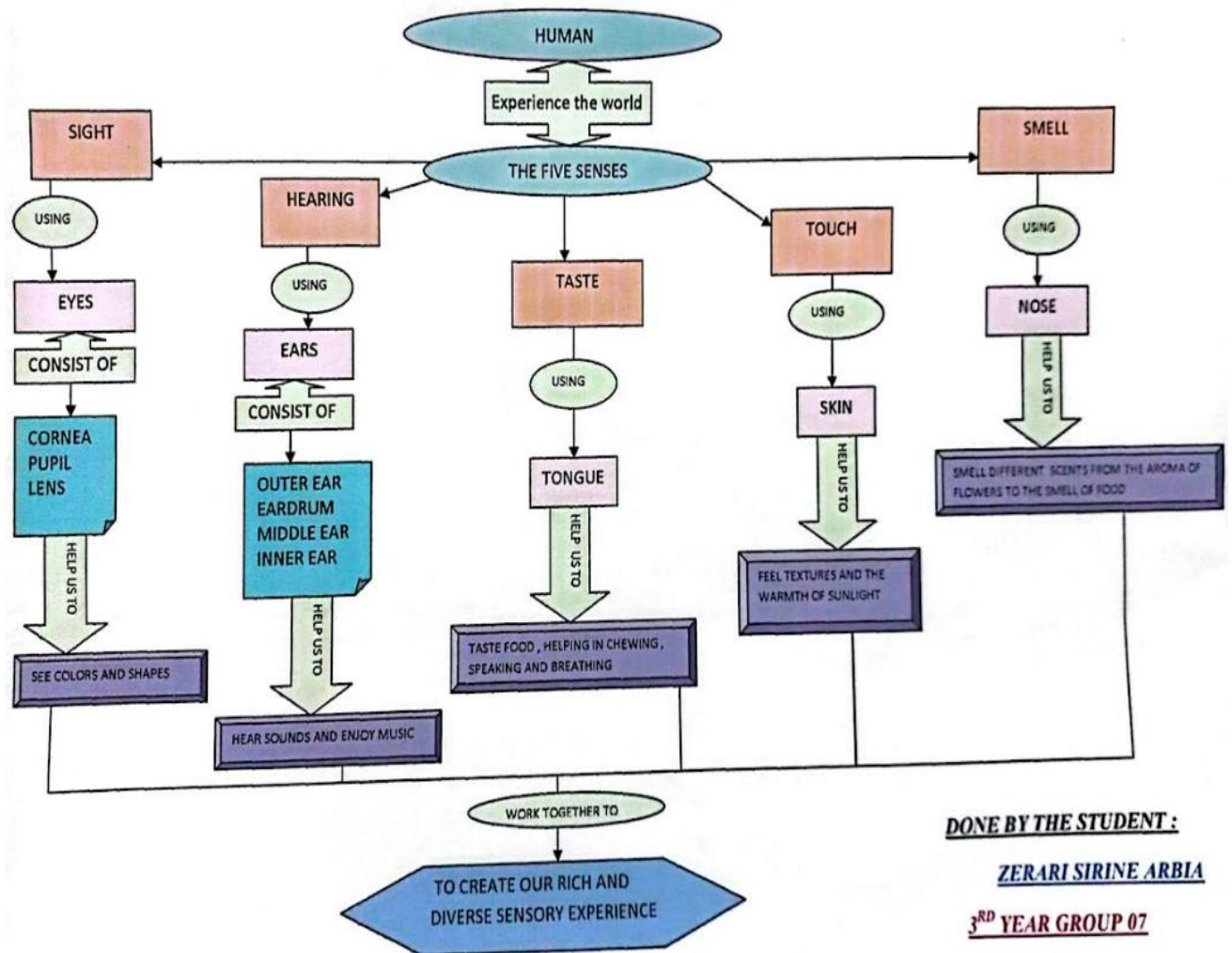
Paragraph 6

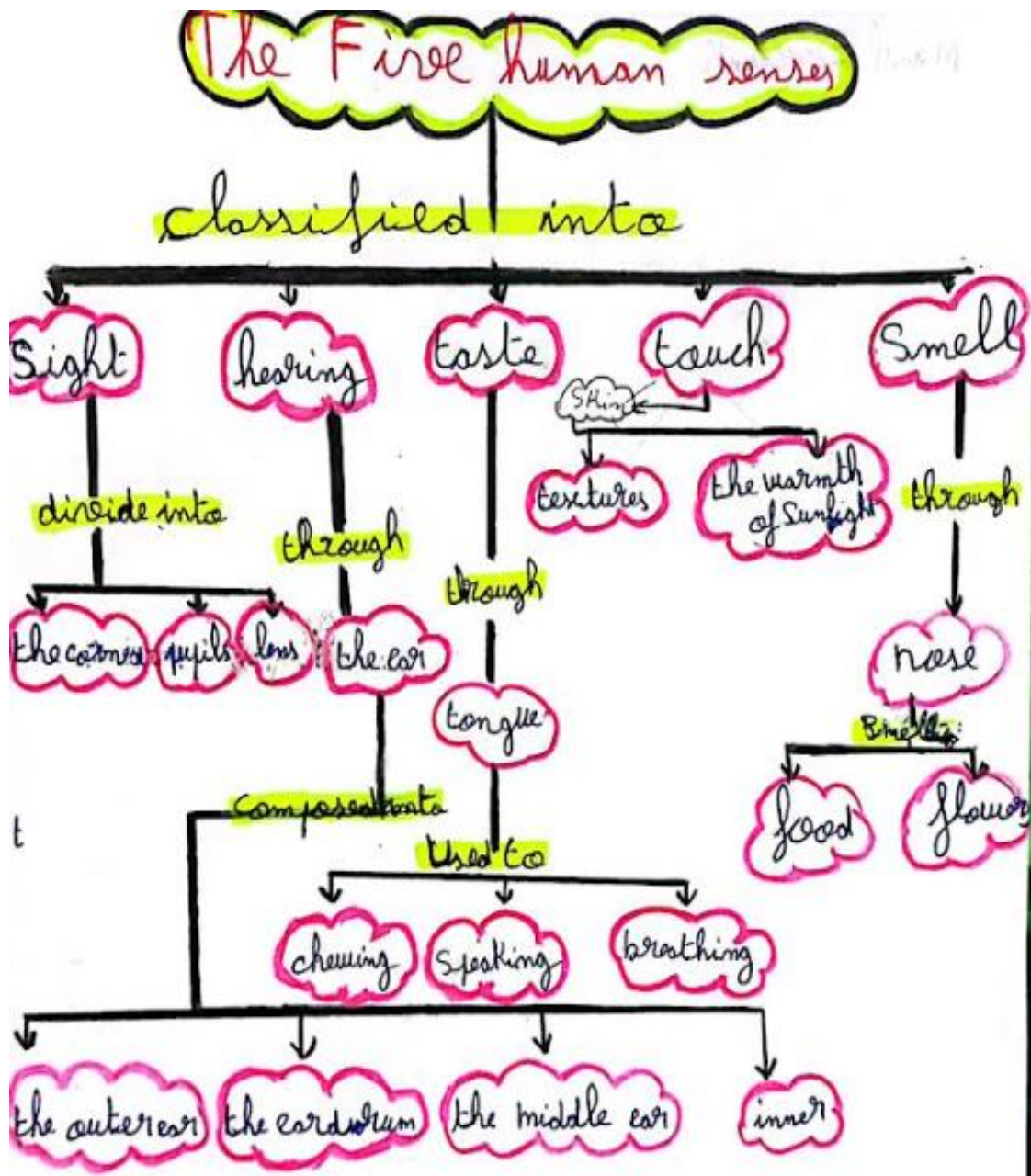
The effects of fast food on human health.
Fast food can contribute various health issues due to many reasons.
Even though most of us love fast food because it's cheap, quick and convenient, but doctors say that it's bad for our health. First, it can cause obesity which is the major health issue caused by fast food, and this health issue is directly connected to the high calories, fats and sugar. Also, cardiovascular problems which means regular consumption of fast food will increase the risk of heart diseases, and we can say it's related to fats and high levels of sodium. At the end we have diabetes risk which is one of the fast food impacts on human health, fast food effect the insulin resistance which can contribute to the development of type 2 diabetes. To conclude, fast food is obviously a danger in the short and long term, so it's better to replace it with more healthy food.

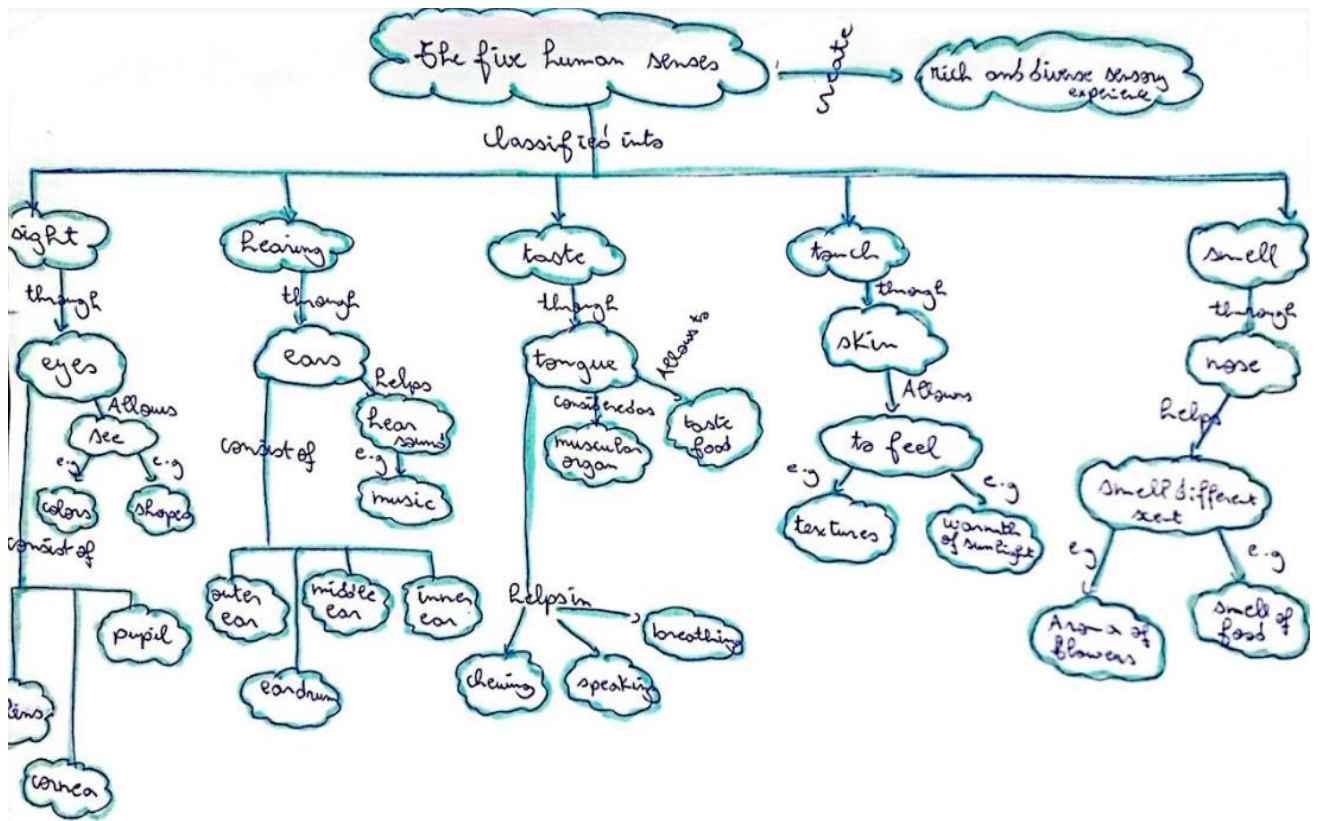
Appendix 18: Samples of Student-Generated Concept Maps

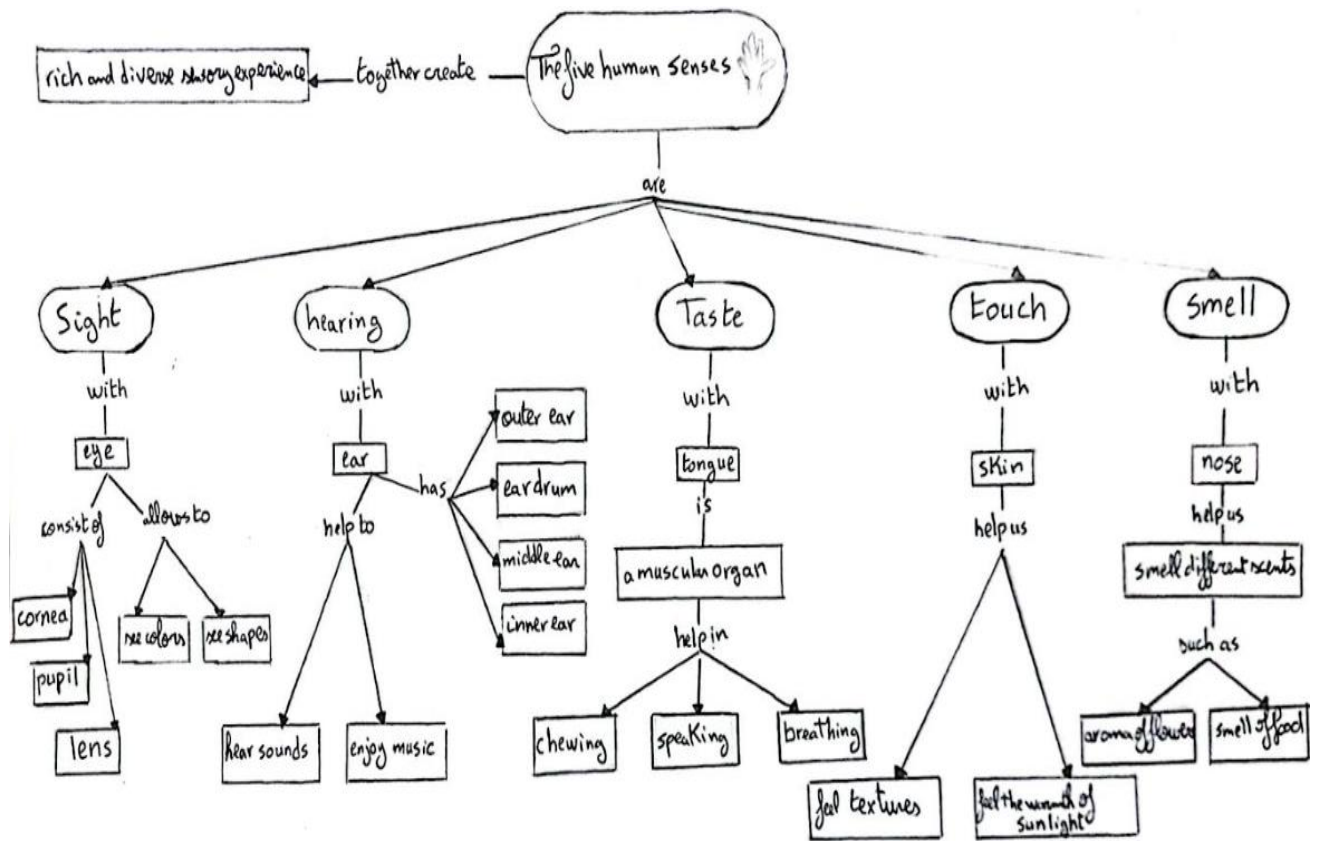
- What are the five human Senses ?











ملخص الدراسة

لقد أبرزت دراسات الكتابة اللغوية الأساسية أهمية الكتابة وجودتها للنجاح الأكاديمي ونشر المعرفة. تعد الكتابة نشاطاً متعدد الأوجه، حيث يمثل المحتوى والتنظيم والآليات مهارات فرعية مهمة حيث تساعد في إنتاج نص وثيق الصلة ومبني بشكل جيد. على الرغم من أهمية الكتابة، فقد لوحظ أن غالبية طلاب السنة الثالثة في اللغة الإنجليزية بجامعة بسكرة يعانون من صعوبات أساسية في الكتابة، ويكافحون من أجل إنتاج عمل متماسك وجيد التنظيم. من خلال العمل ضمن نموذج عملي واعتماد منهج الأساليب المختلطة، يطمح البحث الحالي إلى دراسة تأثير استخدام خرائط المفاهيم كاستراتيجية ما قبل الكتابة على أداء الطلاب في الكتابة فيما يتعلق بالمحتوى والتنظيم والآليات. كما سعت إلى التعرف على اتجاهاتهم نحو تطبيقه في مرحلة ما قبل الكتابة من عملية الكتابة، مع السعي إلى استكشاف الصعوبات الأساسية التي يواجهها الطلاب أثناء انغماسهم في مهمة الكتابة والعوامل الكامنة وراء هذه الصعوبات. بالاعتماد على تصميم بحث مختلط الأساليب، استخدم هذا البحث استبيان المعالجة المسبقة للطلاب، واستبيان المعلم، والاختبار القبلي والاختبار البعدي، ومقابلة الطالب من أجل جمع بيانات كافية من 31 طالباً من طلاب السنة الثالثة للغة الإنجليزية بجامعة بسكرة ومن 10 مدرسين متخصصين في تدريس التعبير الكتابي. أظهرت النتائج من وجود عدداً من صعوبات الكتابة وكذلك تنوعاً في العوامل المساهمة في ذلك. نتائج البحث أشارت أن رسم خرائط المفاهيم يمكن أن يكون أداة فعالة قبل الكتابة لتعزيز أداء الكتابة فيما يتعلق بالمحتوى والتنظيم، حيث تجلت فعاليتها من خلال الاهتمام الحقيقي والموقف الإيجابي الذي يثيره المشاركون.

الكلمات المفتاحية: خريطة المفاهيم، المحتوى، العوامل المساهمة، الآليات، التنظيم، الأداء الكتابي،

عوائق الكتابة