

# Mind Mapping Technique in English Writing Teaching: A Systematic Literature Review

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## Abstract

English writing in the context of globalization has spanned a wide range of personal needs, academic research and professional correspondence. Facing the contradiction between the rising demand for English writing and the low level of students' writing, this paper provides a systematic review of the methods, advantages and challenges of mind mapping in education. Based on PRISMA reporting standards, this paper analysed journal papers indexed in both Web of Science and Scope from 2021 to 2025, and finally 15 papers were included in the review. The study highlights the pedagogical value of mind mapping in teaching and learning, describes the challenges of implementing mind mapping in English writing education, and makes suggestions for future research. Although mind mapping is gradually being integrated into the classroom of English education and has been shown to have a positive impact on students' logic and vocabulary enhancement. However, there are still some problems, such as no significant creative improvement, etc. In the future, empirical studies should be conducted to explore the effects of mind mapping in English writing education of different school years and different ways to solve the negative effects.

**Keywords:** Mind Mapping, Writing, English Teaching, Systematic Literature Review, Mind Mapping Technique

## Introduction

As the wave of globalisation has swept across different social domains like politics, economy and culture, the English writing capacity, as a global common language that goes beyond national borders, has been elevated from a simple linguistic competence to a key trait for subjects to engage in global competition and realise diversified development (Al-Jarf, 2009). In terms of academic contexts, be it paper writing in international core journals, result reporting in global academic conferences, or research plan presentation in applying for foreign top universities, researchers need to construct a logical closed loop with accurate and rigorous English writing. In the context of career development, project plans for multinational companies, contract documents for transnational trade, and policy analysis reports for international institutions all impose nearly exacting requirements on the standardisation and professionalism of English writing (Al Naqbi, 2011). Even at a personal level, personal statements in study abroad applications, opinion expression in international socialising, and communication records in cross-cultural co-operation are all dependent on clear and decent

English writing skills. It could be said that English writing has become a "bridge" linking individuals with the global community, and its proficiency level directly correlates with the access to opportunities and the upper limit of development.

Yet, the present English writing teaching is firmly bogged down in the paradoxical mire of high demand and low efficiency (Abd Karim, 2018). On the one hand, learners' need for good English writing just keeps rising. On the other hand, issues common in teaching practice severely limit the enhancement of students' competence. To be specific, students tend to present a threefold predicament in the writing process. Firstly, at the thinking level, students struggle to generate valuable ideas from the topic or fail to organize a logical chain despite having ideas, thus resulting in vagueness in the essay topic. Second is the structure level, the absence of natural articulation among paragraphs, arguments and arguments are isolated, such as argumentative essays tend to present themselves in the mere piling up of arguments, without considering the development of the argumentative process. Finally, at the motivational level, the majority of students view writing as a task burden, opt for conservative expression for fear of errors, and lack initiative to explore and innovate. Attributing this to the root of the problem, this has a close relationship with the traditional result-oriented model of writing teaching. Teachers tend to emphasize model text analysis, grammatical correction and score evaluation, shrinking writing to the mechanical process of imitation and application, neglecting the guidance of the students' thinking process, making the students degenerate into being text carriers instead of idea builders, and ultimately falling into an vicious cycle of increasingly resistant to learning. How to break this stalemate has turned into a common issue to be addressed by the international English education community.

Here, Mind Mapping as a cognitively appropriate visual thinking tool presents new possibilities for writing instruction innovation. This theory was put forward by British psychologist Tony Buzan in the 1970s, and its basic concept is founded on the radioactive thinking pattern of the brain, with the core subject as the beginning, radiating the sub-topics, keywords, images, colours and other elements in a branching fashion, and translating abstract thought into intuitive graphical frameworks. The specific value of mind mapping over traditional linear note taking is that it preserves the divergent and enhances the convergent property of thinking. It allows free association on a subject to note fleeting inspiration and also allows one to sift through hierarchical relationships to gather scattered ideas into an organic whole, ultimately achieving a cognitive leap from chaos to order.

The pedagogical potential of mind mapping has been reconsidered as constructivist learning theories have become more rooted in the practice of education.

In language instruction, its structured and visual nature makes it strongly adaptable to the process of writing from conception to expression. Writing is essentially externalising implicit thinking in the form of words, and mind maps can serve as a scaffold for thinking to enable learners to clarify ideas before writing, ensure logic in writing, and detect gaps during revising. In recent years, research has started to develop the application of mind maps in writing instruction, such as supporting brainstorming during the pre-writing phase and streamlining chapter organisation in the writing phase, etc. Most of these studies, however, are aimed at one education stage or one kind of writing, without systematic integration across various scenarios.

Meanwhile, there has not been a consensus on crucial issues regarding how mind mapping influences the deeper mechanisms of students' writing thinking and what factors limit the effectiveness of its application.

There have been some efforts to systematically overview mind maps, for instance, mind map application in English language learning (Darajat et al., 2025; ARSLAN & BAYDEMİR, 2017). As well as the development of mind mapping for the creativity of students (St Asyah & BAHRI, 2024), vocabulary development, etc. (Syukur & Tohamba 2025). However, there are some problems with these reviews; on the one hand, the year of study is too old, which may result in new modes of mind mapping application not being discussed. On the other hand, there is no systematic review devoted to the discussion of mind mapping on English writing ability. In view of this, the development of this systematic review has an important theoretical and practical value. At the theoretical level, through a systematic review of the literature in international authoritative databases from 2015-2025, this study will, for the first time, integrate the application cases of Thinking Maps in different educational stages, from primary school to higher education, as well as in different types of writing, including descriptive texts, academic essays, business documents, etc., in order to clarify the evolutionary lineage of its core concepts. This will not only fill the gaps in existing research, but also provide support for theoretical and empirical research on second language acquisition theory and writing instruction, enriching the connotation of related theories. At the practical level, the results of the review will provide a guide for frontline English teachers and a reference for teachers to avoid practical misunderstandings. In addition, for educational administrators and curriculum designers, this study can help them integrate Thinking Maps into the writing curriculum system, promote the transformation of teaching goals from knowledge transfer to thinking cultivation, and ultimately achieve substantial improvement in students' writing ability.

### *Research Objective*

This systematic review aims to achieve the following objectives through a rigorous literature searching and analyzing process: First, to delineate the scope and boundaries of mind mapping research in English writing instruction, categorize related Chinese and English literature from 1990 to 2024 in a systematic way, and understand the time distribution, regional characteristics, and core author groups of the research. Second, to summarize the primary application modes of mind maps in English writing instruction (e.g., pre-class brainstorming, in-class organization, and post-class revision) and their implementation routes in detail, and evaluate their practical impact in arousing students' writing interest, enhancing the structure of articles, and enriching article content; Third, to analyze the determining factors influencing the effectiveness of mind map applications, such as students' cognitive styles, the teaching capability of teachers, and the level of teaching resource support; Fourth, based on the current research status, identify the existing defects in the field and propose future research directions worthy of in-depth exploration, thereby providing extensive and credible academic evidence for the scientific and standardized application of mind mapping technology in English writing instruction.

### *Research Questions*

Based on the above background and research objectives, this paper poses three research questions:

RQ1: What are some of the applications of using Mind Mapping in teaching and learning?

RQ2: What are the advantages of using Mind Mapping in writing teaching?

RQ3: What are the challenges of using Mind Mapping in writing teaching?

### **Methodology**

The research process of this systematic review was formulated and conducted in strict line with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) norm, so as to ensure the objectivity and credibility of the research conclusions through a scientific and standardised process. PRISMA, as an internationally acclaimed reporting norm for systematic reviews, has the essence of minimizing subjective bias in the process of literature screening and analysis through standardised step-by-step design (Tugwell & Tovey, 2021). The essence of PRISMA, as an internationally acclaimed reporting norm for systematic reviews, is to minimize subjective bias in the process of literature screening and analysis through standardised step-by-step design, and to improve the transparency and reproducibility of research (Tugwell & Tovey, 2021). On this basis, this research takes "the application, advantages and challenges of mind mapping in English writing teaching" as the topic core, and uses the three-stage process of "literature search - screening - assessment" of the Scopus and Web of Science (WoS), two international authoritative databases, to accurately locate the relevant research literature, and ultimately to produce systematic conclusions through overall integration and in-depth analysis of the included literature.

To guarantee the rigour of the research process, this study divided the methodological process into six major phases, which are interlocked and collectively form complete research closed loop. In the planning phase, the objectives and boundaries of the research are explained, and "the application of mind mapping in English writing teaching" is determined as the core topic, restricting the literature timeframe, language type, and research type, so as to provide a framework for subsequent steps. In the literature searching phase, a simultaneous search was conducted in Scopus and WoS databases according to a preset search formula to guarantee the coverage of representative literature in the field. In the literature quality evaluation phase, the quality of the initially screened literature was rated through multi-dimensional indicators, such as the scientificity of the research design, validity of the conclusions, and reasonableness of the sample size, so as to eliminate low-quality or methodologically questionable studies. In the data extraction phase, qualified literature is formatted to extract information, such as research object, writing type, mind mapping tools, application scenarios, core conclusions, etc., to establish a standardised data table. In the data synthesis phase, a combination of quantitative statistics and qualitative analysis is applied to cross-compare and thematically summarise the extracted data, and sort out the common patterns and differentiated features of mind mapping applications. In the synthesis writing phase, based on the integration outcomes, the research methodology, results and conclusions are written clearly according to PRISMA reporting requirements to ensure logical coherence and traceability. This process design not only guarantees the systematic nature of the research, but also enhances the reliability of the results.

### *Article Selection Process*

The main aim of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), a peer-reviewed international standard, is to improve transparency, reproducibility, and scientific integrity of systematic reviews by standardising reporting requirements (Tugwell & Tovey, 2021). In systematic reviews in education, PRISMA has become a benchmark framework to ensure that the literature screening phase does not replicate 'selectivity bias's

and further ensures the research can be reproduced by others. Literature screened using PRISMA in the current study, will follow PRISMA specifications, which provides clear reporting requirements, and divides the process into three main phases of 'Identification - Screening - Including' (see the process framework in Figure 1). I have followed the PRISMA specifications to divide the process into three sequential phases (see Figure 1), and provide clear operational criteria and decision bases for each phase, and the flowchart uses the PRISMA template for guidance to allow for adaptive adjustment to fit to the content of the current study.

In the identification stage, the study exhaustively retrieved potential literature in the Scopus and WoS databases using pre-determined criteria in the search strategies so that core studies would not be missed; in the screening stage, the study was conducted in layers of refined exclusion criteria (e.g., time-frame, study type, relevance to topic, etc.) to remove those irrelevant elements from the literature examined, and target focus on those studies that related specifically to the "impact of mind mapping on the teaching and learning of writing." directly to the study; the inclusion stage is the last quality control link; and, through full-text intensive reading established the academic rigour and applicability of the data in the literature, confirming that the included studies could effectively support the core research question.

Not only does this three-phase progressive screen design avoid the interference of redundant information, but it also prevents the loss of important literature due to arbitrary deletion of literatures. The process of conducting a systematic review of the literature achieves its aim of building an accurate literature database, which lays the scientific foundation for future analyses of the data and development of conclusions.

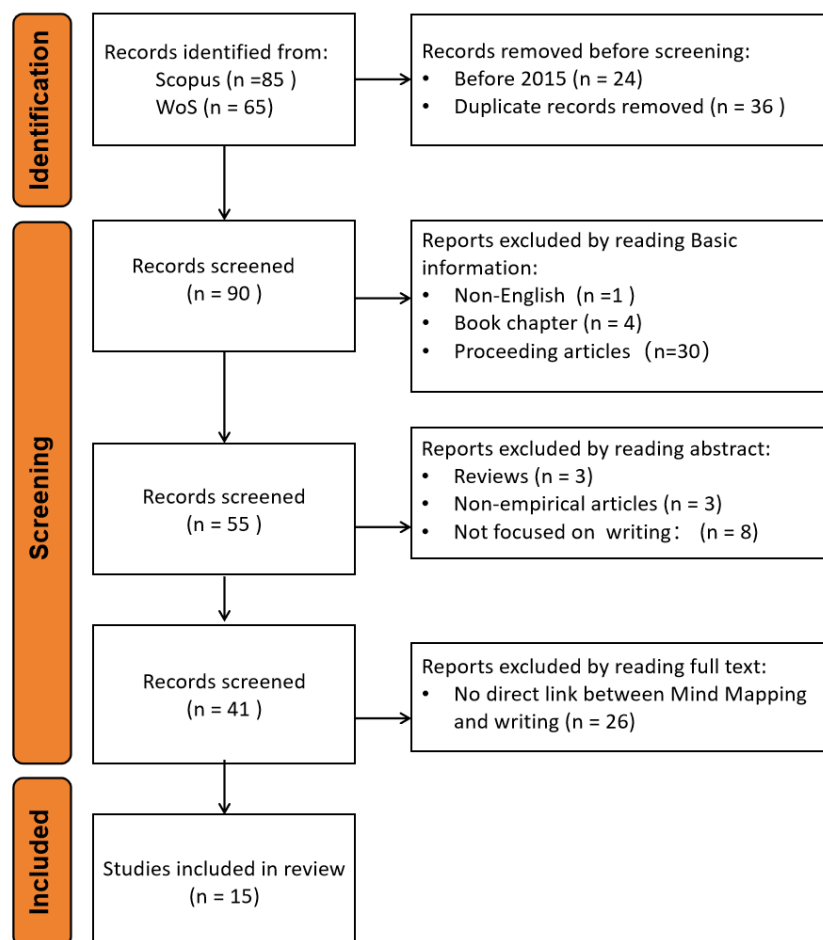


Figure1 article selection process

*Phrase1: Identification*

Table1

*Database and Search Formula*

| Database | Search Formula                                                                                     |
|----------|----------------------------------------------------------------------------------------------------|
| Scopus   | TITLE-ABS-KEY ("Mind Mapping") AND TITLE-ABS-KEY ("writing" OR "English writing" OR "ESL writing") |
| WoS      | TS=("Mind Mapping") AND TS= ("writing" OR "English writing" OR "ESL writing")                      |

This study conducted a literature review process in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocols as shown in table1, identifying literature in two international authoritative databases, namely, Web of Science (WOS) and SCOPUS to ensure comprehensiveness, scientificity and representativity of the literature. The full search was carried out in two international authoritative databases, Web of Science (WOS) and SCOPUS to ensure comprehensiveness, scientificity and representativity of the literature. The search in WOS is: TS= ("Mind Mapping") AND TS= ("writing" OR "English writing" OR "ESL writing"). "TS" is Short for Subject Term Search, covering core fields of titles,

abstracts, and keywords of the document. The search formula combines "mind mapping" and "writing" "English writing" via the AND logical operator "bilingual writing" related themes together to retrieve literature that covered both these core themes. For example, a search in the SCOPUS database, the search formula is: TITLE-ABS-KEY ("Mind Mapping") AND TITLE-ABS-KEY ("writing" OR "English writing" OR "ESL writing"). The TITLE-ABS-KEY signifies that the search was completed on the items title, abstract, and keywords. In addition, the complementary search logic with the WOS database, further extends the pool of literature available covering related research and limits the risk of omission of literature.

### *Phrase2: Screening*

#### Table2

#### *Inclusion and Exclusion Criteria*

| Criteria                 | Inclusion                                                             | Exclusion                                                                     |
|--------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------|
| The focus of the article | A direct exploration of the impact of mind mapping on student writing | Articles those are not focus on the impact of mind mapping on student writing |
| Publication date         | From 2015 to 2025                                                     | <2015                                                                         |
| Publication type         | Journal                                                               | Book、 Proceeding                                                              |
| Article Type             | Empirical Article                                                     | Review、 Concept Paper、 Conceptual article                                     |
| Language                 | English                                                               | Other languages                                                               |

According to PRISMA standard's screening approach, as detailed in table2, the study carried out literature screening in stages. Firstly, the first search in the WOS database using the search formula above identified 65 documents, and the SCOPUS database identified 85 documents, resulting in a total of 150 preliminary search results. Taking into consideration the timeliness and cutting-edge nature of the research, the last ten years of studies better demonstrate the latest progress in the field; therefore, the publication time period was limited from 2015 to 2025 and there were 126 articles remaining after screening the time period. Next, basic information (including title, author, year, source journal, etc.) of 126 articles was imported into an Excel table and systematically organized. Record keeping from both the duplicate detection features of the EndNote software used for document management and manual comparison, we excluded 36 duplicates, and the 90 documents moved to the next stage of screening.

Then the basic information of 90 articles was checked one by one. One article that was not written in English was excluded, because this study is of a pedagogical nature and deal with teaching and learning in the field of English writing and because the context and core content were not as relevant. In all, 30 conference articles were excluded because they were typically preliminary research results with limited academic rigour and depth; 4 book chapters were also excluded because the broad research topics did not align closely enough with our study. This left us with 55 articles. Next, the research team was grouped to read the abstracts of 55 articles closely and then conduct a second screening based on the relevance of the research

topics. In this round we excluded 3 case studies (typically single case studies) since they generally do not provide generalizable conclusions and do not align with the macro-analysis aim of this study. Eight case studies were excluded from the literature that was unrelated to teaching writing such as architecture and medical care, etc. These documents included references to "mind mapping" or "writing", but the core object of research was not related to teaching English writing. After screening the abstracts, we read the full texts of the remaining 41 full articles.

### *Phrase3: Including*

Based on the PRISMA standard which stipulates that "the final inclusion of literature should be directly related to the research topic," 41 pieces of literature have been read with University of Changchun. The focus here was on checking whether, in a general way, the literature referred to directly "the connection between mind mapping and writing," including core content areas of application mechanism, effect analysis, practice path and other elements of the use of mind mapping in writing teaching, including application mechanism, effect analysis, practice path and other core content areas of Mind Mapping in writing teaching. A total of 26 articles were excluded from the literature whose reference did not specifically acknowledge a direct connection between the two, leaving 15 articles to include in this systematic review. In the end all 15 articles referenced are published primarily peer-reviewed articles and center the application of mind mapping in English writing (including second language writing) teaching as one core research theme, which enables a direct and effective academic basis for the systematic analysis of this relationship.

## **Results**

### *Overview of Studies Included*

The educational levels present in the fifteen studies are varied, including primarily primary school, but also ranging up through higher education and vocational education. The studies in primary school involve 4th graders from Bhutan and Turkey who engaged in descriptive and narrative writing, addressing issues of poor coherence and underdeveloped plot structure. Studies in middle school apply to Chinese junior high school students in English narrative writing as well as unspecified 8th graders doing reports about mathematical modelling and Chinese argumentative writing, with the goal of situating logical rigor and multi-dimensional writing. The high school studies include Thai EFL students at varied proficiency levels, Taiwanese university students engaged in flipped English writing classrooms, and unspecified 11th graders exploring creative story writing, with a focus on differentiated instruction and creative thinking. The university-level studies include Iraqi undergraduates in academic writing, as well as unspecified university students preparing literature reviews-based interdisciplinary papers, which explored the use of mind mapping in merging and synthesizing information and structuring arguments in writing. The vocational education studies examine vocational college students writing business English correspondence and technical reports. Advances of better standardization and professional expression are the focus in these institutions.

The types of writing covered are varied, including creative and narrative writing, such as narration, stories, and descriptive essays, where mind mapping helps develop and organize plot lines and glimmerings (original) ideas. There are academic writing contexts, such as argumentative essays, literature reviews, interdisciplinary papers, and academic theses, which

utilize the mind mapping technique to comprehend logical interrelations and incorporate multi-source information. There are also practical writing genres, such as business letters, technical reports, and reports presenting mathematical modelling, that use mind mapping to clarify the key elements of writing and to foster completeness of their structure. And there have been contexts with language learning writing such as EFL writing from students in Iran, Thailand, and Iraq, (EFL) (and their foreign language writing), and Chinese writing by international Chinese students that have also been writing with mind mapping as they use it to design their writing to connect a linguistic and cultural gap, thereby clarifying the accuracy of their expression in writing, and the logical flow of those expressions.

The research methods employed in the related articles included quantitative, qualitative and mixed methods. For the review, 15 articles were screened, with 5 using quantitative, 1 qualitative, and 9 using mixed methods. Quantitative research, which made up the majority (8 studies), used pre-test/post-test, scores based on a rating scale, and statistical analysis of writing produced in order to objectively determine if there was improvement in the dimensions of logical coherence, variety of vocabulary, and structure of the writing. Qualitative research was represented by one study of Thai high school students, which used observation and interviews to look at the relationships between mind mapping and writing strategies. This article was concerned with highlighting how students took up the practice of mind mapping for producing writing - beyond grammar and spelling etc. - as a strategical training while confirming proficiency levels as critical thought in writing. Lastly, mixed methods were represented in 6 studies, which married quantitative measures such as scores, performance indicators such as a rubric; with qualitative measures that drew on student interviews, observed behaviors and student questionnaires to explicitly assess the effectiveness of mind mapping while documenting both observable, measurable improvement as well as the student's subjective impressions. Taken together, the studies which provided a basis confirming that mind-map as evidenced by structure of writing, logical rigor, and student learning engagement were valid plus those articles contributing onto some observed challenges related to the detail towards language, how students adapted to the mind-mapping process, and what limits, if any, exist with mind mapping as either student tool or writing instrument.

*RQ1: What are some of the applications of using Mind Mapping in teaching and learning?*

Table3

| No. | research subjects                         | Type of writin                                                   | application tool                                                | application scenario                                                                                                          |
|-----|-------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 1   | Bhutanese fourth graders                  | descriptive writing                                              | A4 paper, coloured pens, combined with Story Map                | Group work for the first 2 weeks, then independent work for the next 8 weeks, adapted to the pre-writing stage                |
| 2   | Students of National Taiwan University    | English Writing                                                  | 1Know Learning Management System's "Mind Mapping Module"        | Combine with "Watch-Summary-Question (WSQ)" strategy to adapt the flipped classroom pre-class preview and in-class discussion |
| 3   | Iranian intermediate learners             | EFL Writing (involving narrative, argument, etc.)                | Paper or digital tools                                          | Pre-writing stage, adapted to various genres of ideas                                                                         |
| 4   | Turkish fourth-grade students             | Story Writing (Narrative)                                        | A4 paper, coloured pens, combined with Story Map                | Pre-writing stage, adapting narrative essay ideas                                                                             |
| 5   | Chinese junior high school students       | English Narrative Writing                                        | Digital mind mapping software (e.g. Mindomo) + paper worksheets | The whole process of "pre-writing - writing - revising" is adapted to the timeline of the narrative essay                     |
| 6   | Iraqi university students                 | Academic writing (argumentative essays, expository essays, etc.) | Paper Mind Maps + Online Collaboration Platform                 | Adaptation of academic writing such as argumentative and expository essays, incorporating peer-to-peer assessment             |
| 7   | Thai high school students                 | compose                                                          | Simple mind map template (centre + 3-5 branches)                | Pre-writing stage, focusing on idea generation and structural simplification                                                  |
| 8   | student of the second year in high school | Creative Story Writing                                           | "Central Image + Colourful Branches" Paper Mind Maps            | Pre-writing stage for creative ideas                                                                                          |
| 9   | student of three years of college         | Academic paper writing for university (literature review)        | Digital mind mapping software (XMind)                           | Literature review writing stage                                                                                               |
| 10  | Second year students                      | Middle School Mathematical Modelling Report Writing              | "Dual-centre" Thinking Maps                                     | The whole process of writing a mathematical modelling report                                                                  |

|    |                                                         |                                                      |                                                                     |                                                                |
|----|---------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------|
| 11 | Vocational student                                      | Business English Writing for Vocational Institutions | "Modularity" Thinking Maps                                          | The whole process of writing business letters                  |
| 12 | Senior interdisciplinary student                        | Interdisciplinary essay writing for college          | Digital mind mapping tool (MindNode) with cross-file import support | The whole process of writing an interdisciplinary dissertation |
| 13 | Second year students                                    | Essay writing in secondary school                    | Paper Mind Maps + Argumentation Templates                           | The whole process of writing an argumentative essay            |
| 14 | Senior Mechanical Students                              | Technical report writing for vocational education    | "Technical process orientation" mind map template                   | Technical report writing process                               |
| 15 | International students with beginner's level of Chinese | Chinese writing                                      | "Bilingualism" Thinking Maps                                        | Chinese Writing Process                                        |

The data in table 3 indicates that mind mapping in writing has the central structure of 'central theme + branching', and the selection of tools is dependent on the level of school and the writing task. For example, primary school can be facilitated with A4 paper and coloured pens with figurative tools - story maps - and branching can be distinguished in pictures and colours. Bhutan (Wangmo 2018) used a ten-week mind mapping study intervention with Grade 4 students, where primary school students have coloured pens on paper mind mapping. Secondary level schools, and above, often come with digitisation software that includes features like cross-file import and on-line collaboration consideration (e.g. Mindomo, Xmind), and some scenarios used bespoke templates, like bilingual cross-referencing and modularity (Fu & Relyea, 2024; Fahady, 2019; Saad et al. 2019). In the operationalisation, first, we focussed on the subject keywords or pictures, branch and extend the core components (e.g. argument, plot, terminology), identify and mark the logical relationships with symbols and arrows; secondly, perfect the guide map, as group work or optimise individually; finally, write to text on the basis of the Branch structure, to ensure logical coherence.

Mind maps have applications across the much broader writing process and can be flexible in relation to academic level and writing type. The pre-writing phase (pre-course) is mainly about generating ideas, such as idea-chain linking in descriptive writing in primary schools (Le et al, 2023), argument sorting with argumentative essays in secondary school (Uysal & Sidekli, 2023), and information integration with literature reviews in university students (Pribadi & Susilana, 2021), while the in-course phase is about collaborative optimisation (Widiastuti et al, 2024), such as group discussions to add additional branching details and annotating their cross-disciplinary knowledge connections; and the post-course phase is mainly about revision and deepening (Widiastuti et al, 2024), such as checking the formatting of business letters against the guide map, and any redundancies within international students' Chinese writing matched against the logical framework. (Naghmeh-Abbaspour & Rastgoo, 2020).

Furthermore, different genre scenarios have their intended audience- and purpose-related focuses - for example narrative text is good to plan for timeline organisation, argumentative essay linking between overarching thesis and argument, and academic writing focused on literature classification relating to other interdisciplinary logic.

RQ2: What are the advantages of using Mind Mapping in writing teaching?

Table4

*Advantages of mind mapping*

| Articles                           | Enhancing the logic of the writing structure | Stimulate creativity and originality | Enhancing engagement and participation in learning | Promoting multidimensional capacity enhancement | Aids in cross-domain/multi-source information integration | Enhancing the standardisation and professionalism of texts |
|------------------------------------|----------------------------------------------|--------------------------------------|----------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|
| Wangmo (2018)                      | √                                            | √                                    | √                                                  |                                                 |                                                           |                                                            |
| Lin (2019)                         | √                                            |                                      | √                                                  |                                                 |                                                           |                                                            |
| Naghmeh-Abbaspour & Rastgoo (2020) | √                                            | √                                    | √                                                  |                                                 |                                                           |                                                            |
| Uysal & Sidekli (2020)             | √                                            | √                                    | √                                                  |                                                 |                                                           |                                                            |
| Fu & Relyea (2024)                 | √                                            |                                      | √                                                  | √                                               |                                                           |                                                            |
| Fahady (2019)                      | √                                            |                                      | √                                                  |                                                 |                                                           |                                                            |
| Tarin & Yawiloeng (2023)           | √                                            |                                      | √                                                  |                                                 |                                                           |                                                            |
| Widiastuti et al. (2024)           | √                                            | √                                    |                                                    |                                                 |                                                           |                                                            |
| Al-Zyoud et al. (2017)             | √                                            |                                      |                                                    |                                                 | √                                                         |                                                            |
| Vijayavalsalan (2016)              | √                                            |                                      |                                                    |                                                 |                                                           | √                                                          |
| Uysal & Sidekli (2023)             |                                              |                                      |                                                    |                                                 |                                                           | √                                                          |
| Nazri et al. (2018)                | √                                            |                                      |                                                    |                                                 | √                                                         |                                                            |
| Saad et al. (2019)                 | √                                            |                                      |                                                    |                                                 |                                                           |                                                            |
| Pribadi & Susilana (2021)          |                                              |                                      |                                                    |                                                 |                                                           | √                                                          |
| Le et al. (2023)                   | √                                            |                                      | √                                                  |                                                 |                                                           |                                                            |

The fundamental advantages of mind mapping in writing education can be classified into six types. The differences between mind maps and writing frameworks in relation to mind mapping's positive effect on writing and novel task completion were focused on the mind

mapping domain, its identification and mapping. The mind-mapping domains indicate improved logical structure of writing (as indicated in table 4). This is the most common benefit, incorporating domain items like paragraph structure, plot coherence and argument structure. For instance, Wangmo's study (2018) showed students writing scores for 'paragraph structure improved by 27%, Uysal & Sidekli's (2020) referred to 'plot coherence' with a final improved result of 34%. Saadi et al. (2019) do have a solid contribution that exhibited 40% more correlation between subarguments and core arguments in a student's writing test. This was a reflection of mind mapping increasing logical chains. The potential that mind mapping can elicit creativity and originality is interesting. Visual branching cognitively seems could promote associative thinking and increase uniqueness of content. For instance, students as feedback suggested mind mapping "stimulates imagination" (Wangmo, 2018), it was noted that the frequency of "unique plot" in the student's essays increased by 29% following the teachers' intervention in Uysal & Sidekli (2020) study, In Widiastuti et al. (2024) study in our Experimental group the average number of creative ideas (6.2) was statistically significantly higher than the average control group (3.8).

Also, mind mapping increases learning engagement and participation, decreases writing anxiety, and increases autonomy and classroom participation. 81% of students in Wangmo's (2018) questionnaire survey, found "writing was easier", Lin's (2019) experimental group increased out of class study time by 59%, and Le et al.'s (2023) survey, however 65% of international students provided feedback they were "more confident in writing".

Mind mapping can also assist participatory writing in developing multidimensional competence. There is research demonstrating overall improvements in vocabulary, grammar, and fluency; Fu & Relyea (2024) study demonstrates a notable increase in vocabulary diversity (Type-Token Ratio increased from 0.55 to 0.65), and grammatical complexity (increase in T-unit length), while providing evidence of progress in fluency (there was a 48% increase in frequency of transition word use among the Fu & Relyea's (2024) experimental group). Mind maps can help coordinate cross-domain and multi-source information, with great success in academic writing and interdisciplinary assignments. Al-Zyoud et al. (2017) realized a 35% increase in efficiency of identifying correlations from the literature by using mind maps to compare makers and help with research design. Nazri et al. (2018) interdisciplinary dissertation "knowledge integration" improved by 28% and is reflective of contributing to the association of information across multiple sources.

Mind mapping also helps to improve text normality and professionalism, ensuring complete formatting and elements in applied writing. Uysal & Sidekli's (2023) business letter "information omission rate was reduced from 42 per cent to 18 per cent", Pribadi & Susilana's (2021) technical report "Step errors reduced from 3.2 to 0.8", reflecting the reinforcement of normality.

RQ3: What are the challenges of using Mind Mapping in writing teaching?

Table5

*Challenges of Mind Mapping*

| Articles                           | Limited enhancement of linguistic detail | Differences in the adaptability of students' thinking | Tools and cost issues | Culture / Subject Limits | Overdependence and inflexibility |
|------------------------------------|------------------------------------------|-------------------------------------------------------|-----------------------|--------------------------|----------------------------------|
| Wangmo (2018)                      | √                                        | √                                                     | √                     |                          |                                  |
| Lin (2019)                         | √                                        | √                                                     | √                     |                          |                                  |
| Naghmeh-Abbaspour & Rastgoo (2020) | √                                        | √                                                     |                       | √                        |                                  |
| Uysal & Sidekli (2020)             | √                                        |                                                       | √                     | √                        |                                  |
| Fu & Relyea (2024)                 | √                                        |                                                       | √                     |                          |                                  |
| Fahady (2019)                      |                                          | √                                                     | √                     | √                        |                                  |
| Tarin & Yawiloeng (2023)           |                                          | √                                                     | √                     | √                        | √                                |
| Widiastuti et al. (2024)           |                                          |                                                       | √                     | √                        |                                  |
| Al-Zyoud et al. (2017)             |                                          |                                                       | √                     |                          |                                  |
| Vijayavalsalan (2016)              |                                          | √                                                     |                       | √                        |                                  |
| Uysal & Sidekli (2023)             | √                                        |                                                       |                       |                          | √                                |
| Nazri et al. (2018)                | √                                        |                                                       | √                     |                          |                                  |
| Saad et al. (2019)                 |                                          |                                                       |                       | √                        | √                                |
| Pribadi & Susilana (2021)          | √                                        |                                                       | √                     |                          | √                                |
| Le et al. (2023)                   | √                                        |                                                       |                       | √                        | √                                |

The limitations of mind mapping were classified into five broad categories (refer to table5). The first is the limited improvement in language-related elements. Students who used mind maps generally showed limited improvement in vocabulary variety, grammatical accuracy and rhetorical use. Wangmo (2018) found that the participants showed no significant difference in vocabulary variety, yet Naghmeh-Abbaspour & Rastgoo (2020) found no significant difference in vocabulary variety. Uysal & Sidekli (2023) even observe that "business terms are ambiguous" point to this limitation. At a minimum, there was some variability in how students adapted to thinking of mind mapping as a tool. Acceptance of non-linear thinking varied by participant's level. For example, 2 students in Wangmo (2018) had "difficulty in distilling the main idea", Tarin & Yawiloeng (2023) found low level students' "overly relied on templates" and Vijayavalsalan (2016) reported that his science students had a "low acceptance of visualisation tools". Further, there are also tool and cost factors related to the usage of mind mapping, for instance, the costs of materials, class time and technology thresholds. Wangmo

(2018) notes that "Increased cost of coloured pens / paper" is a low-cost consideration. Using digital mind mapping may introduce equipment factors as well as time costs for participants. Uysal & Sidekli (2020) noted "2 additional lesson hours a week", Al-Zyoud et al. (2017) noted that "Software operation takes 1-2 class hours to learn", and Nazri et al. (2018) noted "Digital tools take 2-3 class hours at the start".

Mind mapping does have cultural and thematic constraints. When we think of abstract themes or cultural variation, we cannot apply the mind map method, as these themes are difficult to map. Uysal & Sidekli (2020) "Difficulty in mapping abstract themes (e.g., emotions)", Fahady (2019) "The limits of religious, political themes", or Le et al (2023) see differences across cultures in terms of themes, or Widiastuti et al. (2024) who talk of faulty branching with abstract themes such as time travel. With mind mapping methods, students can also suffer a further injury, in the form of over-reliance on mind maps and a limited flexibility. There will always be something that is templating or a tool so people cannot innovatively adapt to a new situation. Uysal & Sidekli (2023) 'fixed modules are difficult to cope with non-standardised business scenarios', Pribadi & Susilana (2021) 'templates restrict atypical fault analysis', Tarin & Yawiloeng (2023) reported about 'templates reducing low-level pupil creativity'

## Discussion

This systematic literature review synthesises and analyses the uses, benefits and difficulties involved with mind map use in teaching English writing, contributing important knowledge in understanding how mind maps can contribute to addressing the contradiction between the increased demand for writing and low level of student writing. The review results confirmed existing research and present unique theoretical and practical contributions to knowledge. The review demonstrates that mind mapping expresses significant flexibility across education levels (from primary to higher education) and forms of writing (descriptive writing, academic writing, business writing, etc.). Its use is expressed throughout different stages in the writing process through pre-writing with idea generation, classroom-based collaboration, post-writing supporting revision; and in the use of both 'traditional' tools (paper, different colour pens) coupled with digital mind mapping applications (e.g. Mindomo, XMind). This adaptability reflects the authors' ability to accommodate flexible instructional design frameworks with mind mapping, such as flipped classrooms and project-based learning (Widiastuti et al., 2024).

A noteworthy feature of the findings is the combined use of mind mapping with tools specific to genre features. For example, primaries in Bhutan and Turkey used story maps in conjunction with narrative writing from the outset, which allowed for story maps to structure the components of narrative writing, contributing further reason to the effectiveness. This backs constructivist learning theory that promotes active construction of knowledge through scaffolded tools. Thinking maps are overlays for visual scaffolds that allow students to externalise and organise their thinking, facilitating the closure between discontinuity and coherence in their texts (Buzan, 2006).

The primary advantage of mind mapping, contributing positively to logical structure of writing, was verified in 13 of the 15 studies, addressing a significant pedagogical pain point of student coherence and organisation. For example, Wangmo (2018) references a 27% improvement in "paragraph organisation" from students who used mind map, while Saad et al. (2019) noted

a 40% improvement with the fit of students' sub-arguments to their core argument in writing. This improvement in structure derived mainly from mind maps' ability to represent hierarchical relationships, enabling students to visually see and identify: logical gaps or redundancies before writing.

Moreover, mind mapping also facilitates creativity beyond structural coherency. For instance, Uysal and Sidekli's (2020) study recorded a 29 per cent increase in frequency of 'unique plots'; and, 81 per cent of students in Wangmo's (2018) study reported that mind mapping reduced their writing anxiety. Mind mapping demonstrates potentials for reframing passive "outcome-based" instruction, towards an active, student-centric instructional model. The findings also support prior research that establish a visualisation tool's ability to activate associative thinking and reduce cognitive impairment that accompanies writing (Naghmeh-Abbaspour & Rastgoo, 2020).

### **Limitations**

There are some limitations to this review. First, relying only on Scopus and Web of Science databases may have missed relevant studies in regional databases, potentially limiting geographic diversity. Second, focusing on the 2015-2025 literature ensures timeliness but ignores earlier foundational research. Finally, the exclusion of non-English literature and conference papers may miss context-specific insights from underrepresented regions.

### *Future Research*

Future research can extend a prediction in three ways: First, a large-sample randomised controlled trial in order to establish the effects of mind mapping on specific elements of writing, such as grammatical precision and lexical richness, as well as the longitudinal effects long-term on learners at different levels, and longitudinal studies can accomplish this; The second is the investigation of more targeted solutions, such as mixing vocabulary and grammar instruction to make up for a lack of language mechanics, and designing templates tailored to different thinking-types in order to decrease template dependency for lower-level learners.; Finally, we will expand the scope of the study including testing its effects in less-represented genres, such as academic abstracts and intercultural texts, as well as exploring the capabilities of AI-assisted mind mapping tools, and using qualitative methods such as classroom discourse analysis to illuminate the cognitive journey of students transforming their mind maps into texts in order to provide a more precise theoretical underpinning for pedagogical practice.

In view of the limited effectiveness of mind maps in improving vocabulary diversity, grammatical accuracy and other linguistic details, it is recommended that mind maps be deeply integrated with specialised language training modules. In specific teaching situations, teachers can guide students to mark the core vocabulary, fixed collocations and grammatical structures required for each branch node as they construct the mind map. After the implementation, students can clarify the language expression norms when planning the structure of the essay, effectively reduce the problems of poor vocabulary, grammatical errors, etc., so that the essay can achieve the double enhancement of linguistic accuracy and richness on the basis of logical clarity, which complements the positive effect of the Thinking Maps on the optimisation of the structure of the study, and enhances the quality of the writing in an all-round way.

## Conclusion

This systematic review has provided a useful insight into the use of mind maps in English writing instruction and it reaffirms mind maps as a versatile pedagogical resource for improving writing structure, improving student engagement and stimulating creativity. Their use for mind mapping and writing instruction is applicable at all levels of education and types of writing; they can be used with traditional tools and digital tools; and they can be used for curricular and extra-curricular contexts. The benefits of mind map use included improved logical coherence; the stimulation of original thinking; and engagement in classroom activities and the main limitations suggest need for consideration of how mind maps are employed with other pedagogical options.

For practitioners, the review situated educators with evidence-informed practice such as; supporting preliminary writing with a mind map; coupling a mind map with collaborative learning through task-based flipped classrooms and shared online tools; and addressing cultural diversity issues through culturally relevant topic-based activities. For researchers, the review documented several potential future avenues of research, including investigating conditions for synergizing mind mapping and explicit grammar instruction; experiment with mind mapping methodologies within less traditional types of written expression (eg, storytelling and journalling); and experimenting developing culturally responsive mind maps to address contextual constraints.

In summary, mind mapping has emerged as a powerful means of countering boundaries to English writing around the world, however, actualizing effective mind mapping is likely dependent upon how educators construct intentions for mind mapping. By being cognizant of the etymology for mind mapping; and skilfully negotiating its limitations with student intended uses, mind maps can be used to advance, positively, the transition away from traditional, result-oriented writing instruction, to a much more dynamic and creative process of promoting knowledge-making activities.

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