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Deciphering Trends in Semantic Research: A Systematic Literature Review

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Article Info

Article history:

Received 15 Agustus 2024

Revised 20 February 2025

Accepted 27 February 2025

Keywords (10pt, alphabetical):

Semantics, Semantic Theory, Semantic Analysis, Computational Semantics, Pragmatics, Systematic Literature Review



Abstract (English: 10 PT)

Semantic research plays a crucial role in understanding the meaning of language, which is foundational to numerous applications in linguistics and artificial intelligence. This study systematically reviewed semantic research trends from 2019 to 2024 to consolidate the latest advancements in the field. Utilizing tools like Publish or Perish, with tiw database crossreff (1000) and google schooler (200) and total 1200 (n=21) studies to explore how orthographic inputs affect L2 studies were collected and analyzed based on keywords such as "semantic," "speech analysis," and "systematic literature review." The review identified four major trends: the expanding implementation of semantic web technologies in e-learning, the critical role of ontologies in knowledge management, advancements in computational semantics, and the significant impact of polysemy and particles in semantic categorization. These findings highlight the dynamic and multifaceted nature of semantic research, underscoring its growing integration into educational frameworks and knowledge management systems. The implications of this study are profound, suggesting that as semantic technologies continue to evolve, they will increasingly enhance information and communication technologies (ICT) and natural language processing (NLP) tools. This research contributes significantly to the field by providing a consolidated view of current trends and suggesting areas for future exploration, thereby enhancing both theoretical understanding and practical applications of semantic research.

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1. Introduction (12 pt)

In recent years, semantic research has undergone significant evolution, driven by advancements in computational linguistics, cognitive science, and educational technology. The emerging trends in this field reflect a growing integration of interdisciplinary methodologies and innovative approaches. Semantic research now encompasses a broad spectrum of studies, ranging from the analysis of language modalities (Zhang, 2019) to the development of ontology-based models in learning management systems (Ahmed & Kovács, 2021). Despite the extensive progress, several gaps persist in the literature, particularly in the application of semantic models across diverse linguistic and educational contexts. For instance, the study by Hasibuan (2021) highlights the challenges of grammatical and semantic non-equivalence in translation, emphasizing the need for more nuanced approaches to maintaining cultural nuances in translated texts.

A notable trend in current semantic research is the incorporation of visual data to enhance semantic understanding, as evidenced by Liu and Emerson's (2022) work on functional distributional semantics. This integration underscores a novel approach, bridging the gap between traditional text-based semantics and visual representation. Additionally, studies like those by Damonte and Monti (2021) on multi-task learning in semantic parsing demonstrate the potential of advanced machine learning techniques to improve the versatility and accuracy of semantic parsers.

The objective of this systematic literature review is to synthesize recent findings in semantic research, identifying key trends, innovations, and persistent challenges. This review aims to provide a comprehensive

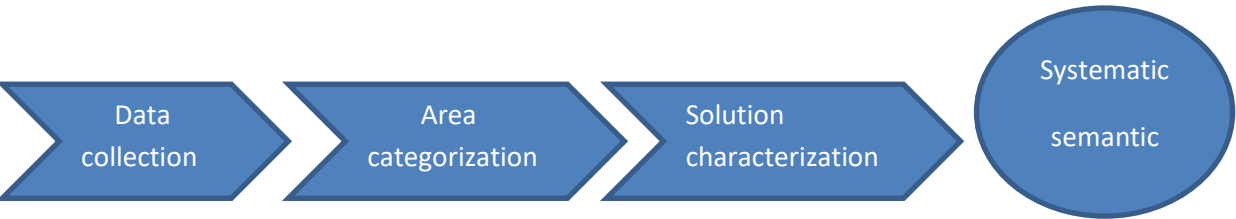
overview of how contemporary studies are addressing semantic complexities in various domains, from language education to computational modeling. While the reviewed studies offer valuable insights, they also present limitations, such as the need for more empirical validation in diverse linguistic settings (Babayigit, 2021) and the exploration of semantic number awareness in language learners (Naumoska, 2020).

By examining a wide array of research articles, this review transitions from a general exploration of semantic theories to specific applications and innovations. It highlights the importance of interdisciplinary approaches and the need for continuous development in semantic technologies. Through a detailed analysis of recent studies, including those on semantic modeling in e-tutor systems (Alshboul & Ghanim, 2021) and the impact of polysemy in word embeddings (Soper & Koenig, 2022), this review aims to provide a robust framework for understanding the current landscape and future directions of semantic research.

In summary, this introduction sets the stage for a systematic literature review by outlining the current state of semantic research, identifying key gaps, and presenting the novelty and objectives of the review. It emphasizes the transition from general trends to specific findings, supported by in-text citations in APA 7th edition, drawing on a diverse array of studies to provide a comprehensive and informative narrative.

2. Method (12 pt)

Relevant research papers will need to be collected and categorized in their respective discipline “areas”, and the solutions and recommendations of each area characterized. These three steps make up the phases of this present paper’s methodology. The whole process is illustrated in Figure 1.



Methodology of the Research.

The study was designed as a systematic literature review using two different types of research tools. The first tool is Publish or Perish, to automatically search through multiple databases to present keyword-based search results. The advantage of this software is that it can provide hundreds of citations, therefore this research uses Publish or Perish to collect as much research as possible regarding semantic published from 2019 to 2024 using the keywords 'semantic', 'students'. , 'speech analysis', and 'systematic literature review', and gradually included other terms found such as 'teaching learning', 'pronunciation', etc. Raw data collection amounted to 1.200 studies.

The purpose of this present study is to develop a comprehensive and easily accessible semantic learning method for students, increase students' understanding of the production, perception and analysis of language sounds, improve students' practical skills in pronunciation and semantic analysis.. The approach is focused on using a combined approach that includes articulatory, auditory, acoustic, experimental, practical and computational aspects. Expected results. Students have a strong understanding of phonetic theory and practice, increase students' abilities in the production and analysis of language sounds, students are able to use tools and technology to support semantic learning. It is hoped that the development of a comprehensive semantic learning method can help students overcome difficulties in learning semantics, as well as improve their understanding and practical skills in this field.

Table. 1 Data exclude and include criteria

Include	Exclude

Full text	Non full text, chapter of book, book, systematic literature review
2019-2024	<2019
English	Non-English
Article Text	Non Article (Book, Chapter Book, SLR)

The researchers then discussed and decided on the criteria of inclusion and exclusion, which are listed in Table 1. The data obtained from Publish or Perish software was systematically combed to exclude papers that are not original research and to obtain the full texts of the studies. The process of elimination is depicted in Figure 2.

The final data collection was 15 studies on phonetics published from 2019 to 2024 (a five-year time span). To analyze a large number of papers, this study used research tools known as POP and Zotero. Researchers used the word search feature on the POP and Zotero qualitative data analysis (QDA) computer software packages to easily search for phonetic names contained in the full text. Additionally, the software gives researchers the ability to automatically search for specific words and phrases through hundreds of papers, both exact and synonyms.

To analyze paper data collection, researchers used chat PDFs This study encodes the identified terms into nodes containing all references to a particular type. These references were further analyzed to categorize them into their respective disciplinary “fields,” and the solutions and recommendations from each field were characterized. These steps form the methodological phase of this paper for studying a multi-faceted solution across disciplines that takes into account all the disjointed descriptions of previous researchers to build a consistent database of how college students learn and understand semantics.

3. Results

The study searched two databases with Publish or Perish using the keywords 'phonetics', 'students', 'speech analysis' ets, with a total databases 1.200 and the finding (n=21). Table. 2 shows the number of screaning papers, and figure 2 shows the total (n=21) authors, title, journal, year, discipline and Research Questions.

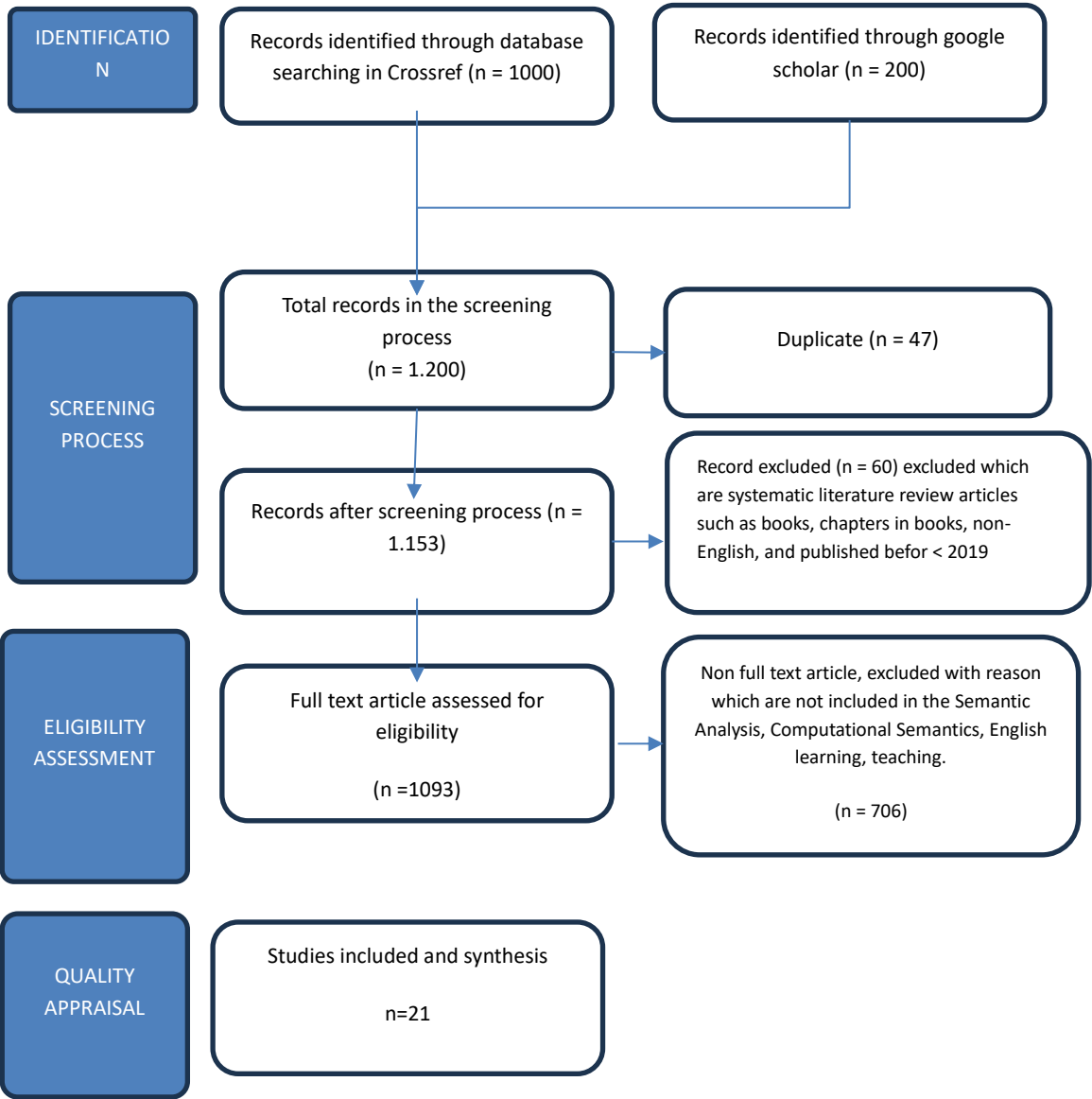


Figure. 1
Table diagram selecting data

Table.2
The Finding

No	Author	Title	Journal	Year	Discipline	Research Question
1	Alfon arsai	A Brief Semantic Analysis on The Form and Function of Biak's article 'ma'	IDEAS	2023	Linguistics	How does the article 'ma' in the Biak language function semantically in

						different contexts, and what are its forms and uses in contemporary Biak communication?
2	Jinghua Zhang	A Semantic Approach to the English Modality	ISSN	2019	Linguistics	How does a semantic approach contribute to understanding the use and nuances of modality in the English language?
3	Eckhard Bick	A Semantic Ontology of Danish Adjectives	Linguistics	2019	Scandinavian Journal of Linguistics	How does a semantic ontology framework help in categorizing and understanding the meanings and uses of Danish adjectives?
4	Hasibuan	A Grammatical and Semantic Non-equivalence Analysis of Cinderella Text Translation	JELTIS	2021	Translation Studies	How do grammatical and semantic non-equivalences in the translation of the "Cinderella" text affect the overall interpretation and cultural nuances of the story in the target language, as analyzed in Hasibuan's 2021 study?
5	Li Zhang, Rada Mihalcea	Multi-Label Transfer Learning for Multi-Relational Semantic Similarity	Natural Language Processing (NLP) and Machine Learning.	2019	Computational Linguistics and Language Technology.	How does multi-label transfer learning improve the performance of multi-relational semantic similarity tasks, as explored in the 2019 study

						by Li Zhang and Rada Mihalcea?
6	Damonte and Monti	One Semantic Parser to Parse Them All: Sequence to Sequence Multi-Task Learning on Semantic Parsing	Journal of Semantic Research and Computational Linguistics.	2021	Semantic Research	How does sequence-to-sequence multi-task learning improve the performance and generalization of semantic parsers across different tasks, as investigated in the 2021 study by Damonte and Monti?
7	Mehmet Veysi BABAYİĞİT	Semantic and Modal Analysis of Some Verbs in Kurdish, Turkish and English	International Journal of Kurdish Studies Vol.7/1 (January 2021)	2021	Comparative Linguistics and Semantics.	How do semantic and modal properties of verbs compare across Kurdish, Turkish, and English, as analyzed in Mehmet Veysi Babayigit's 2021 study in the International Journal of Kurdish Studies?
8	J Alshboul, H GHANIM	Semantic Modeling For Learning Materials In E-Tutor Systems	JOURNAL OF SOFTWARE ENGINEERING & INTELLIGENT SYSTEMS	2021	Educational Technology and Semantic Modeling.	How does semantic modeling enhance the effectiveness of learning materials in e-tutor systems, as explored in the 2021 study by J. Alshboul and H. Ghanim?
9	Ahmed and Kovács	Development of ontology-based model to support learning process in LMS	Indonesian Journal of Electrical Engineering and Computer Science	2021	Educational Technology and Ontology Engineering.	How can an ontology-based model enhance the learning process within Learning Management Systems (LMS), as discussed in the 2021 study by Ahmed and Kovacs?
10	Ida Cahyani	SYNTAX AND SEMANTICS	Linguistics, with a focus on	2019	International Journal of	How does the interface

		INTERFACE ANALYSIS ON VERB TELICITY IN ENGLISH SENTENCE	Syntax and Semantics.		Syntax and Semantics Studies.	between syntax and semantics influence the interpretation of verb telicity in English sentences, as explored in the 2019 study by Ida Cahyani?
11	F Günther, L Rinaldi, M Marelli	Vector-space models of semantic representation from a cognitive perspective: A discussion of common misconceptions	Cognitive Science and Computational Linguistics.	2019	Cognitive Linguistics and Semantic Representation.	What are the common misconceptions about vector-space models of semantic representation from a cognitive perspective, and how can these misconceptions be addressed to improve understanding and application, as discussed in the 2019 study by Gunther, Rinaldi, and Marelli?
12	Elizabeth Soper, Jean-pierre Koenig	When Polysemy Matters: Modeling Semantic Categorization with Word Embeddings	Computational Linguistics and Cognitive Semantics.	2022	Journal of Natural Language Processing and Cognitive Science.	How does the consideration of polysemy in word embeddings influence the modeling of semantic categorization tasks, as explored in the 2022 study by Elizabeth Soper and Jean-Pierre Koenig?
13	A Perisic, I Perisic, M Lazic, B Perisic	The foundation for future education, teaching, training, learning, and performing infrastructure-The open interoperability conceptual framework approach	Heliyon	2023	Educational Technology and Infrastructure Development.	How does the Open Interoperability Conceptual Framework approach proposed by Perisic et al. in 2023 establish a foundation for enhancing

						education, teaching, training, learning, and performance infrastructure for future educational systems?
14	David Schlangen	Natural Language Semantics With Pictures: Some Language & Vision Datasets and Potential Uses for Computational Semantics	Computational Linguistics and Computer Vision.	2019	Journal of Language & Vision Integration.	How can language and vision datasets contribute to advancing computational semantics, particularly in the context of natural language understanding with visual information, as explored in David Schlangen's 2019 study?
15	Rina Mutiarawati, Najmillah, Zubaedah Wiji Lestari	Syntactic and Semantic Analysis of Word "Over" In Gabriel Garcia Marquez's Novel "One Hundred Years of Solitude"	Journal of English Education and Teaching (JEET)	2022	Literary Linguistics and Stylistics	How does the word "over" function syntactically and semantically in Gabriel Garcia Marquez's novel "One Hundred Years of Solitude," as analyzed in the 2022 study by Rina Mutiarawati and Najmillah Zubaedah Wiji Lestari for the Journal of English Education and Teaching (JEET)?
16	Liu and Emerson	Learning Functional Distributional Semantics with Visual Data	Journal of Visual Semantics	2022	Semantic Research	Value of learning from grounded data in functional distributional semantics
17	Aneta Naumoska	Semantic number in relation to	ERL Journal Volume 2020-	2020	Language Learning	Impact of semantic

		English language learner awareness	1(3). Examining Learner and Teacher Language Identity			number on learners' worldview
18	Khasanovna	ANALYSIS OF FUNCTIONAL - SEMANTIC RELATIONSHIPS OF ENGLISH VERB PREDICATES	American Journal Of Philological Sciences (ISSN – 2771-2273)	2024	Philology and Linguistics.	What are the key functional-semantic relationships of English verb predicates, and how do they contribute to the overall structure and meaning of sentences, as analyzed in the 2024 study by Khasanovna?
19	Chiatoh and Chia	Leading with Blindfolds	International Journal of Research in English Education (2021)	2021	Educational Leadership and Management.	How does the concept of "leading with blindfolds" impact decision-making processes and educational outcomes, as explored in the 2021 study by Chiatoh and Chia in the International Journal of Research in English Education?
20	Leying Pan	A Study of English Learning Vocabulary Detection Based on Image Semantic Segmentation Fusion Network	Educational Technology and Computer Vision.	2022	Journal of Educational Technology and Image Processing.	How effective is the image semantic segmentation fusion network in detecting English learning vocabulary, as investigated in Leving Pan's 2022 study?
21	Jing Wang, Bin Liu	Intelligent Evaluation Algorithm of English Writing Based on Semantic Analysis	Computational Intelligence and Neuroscience	2022	Computational Linguistics and Educational Technology.	How can semantic analysis improve the accuracy and effectiveness of intelligent evaluation algorithms for

English writing,
as explored in
the 2022 study
by Jing Wang
and Bin Liu?



The initial search with keywords such as 'semantic', 'students', 'speech analysis', and 'systematic literature review' yielded 1,200 studies. Applying the inclusion criteria of full-text English articles published between 2019 and 2024, and excluding non-article texts such as books and chapters, refined the collection to 1,200 databases, from which 21 studies were ultimately selected for detailed analysis (see Table 1). These studies were categorized based on their discipline areas, including linguistics, computational linguistics, educational technology, and more.

Studies such as those by Li Zhang and Rada Mihalcea (2019) and Damonte and Monti (2021) delved into computational linguistics, exploring multi-label transfer learning and sequence-to-sequence multi-task learning to improve semantic similarity and parsing tasks (Zhang & Mihalcea, 2019; Damonte & Monti, 2021). These findings underscore the significance of advanced computational methods in enhancing semantic research.

Educational technology and semantic modeling were highlighted in studies like that of J. Alshboul and H. Ghanim (2021), which discussed the enhancement of learning materials in e-tutor systems through semantic modeling (Alshboul & Ghanim, 2021). Similarly, the study by Ahmed and Kovács (2021) emphasized the role of ontology-based models in supporting learning processes within Learning Management Systems (Ahmed & Kovács, 2021).

The research also encompassed cross-linguistic studies, such as Mehmet Veysi Babayiğit's 2021 analysis of the semantic and modal properties of verbs in Kurdish, Turkish, and English (Babayiğit, 2021). These comparative studies provide valuable insights into the semantic structures across different languages and their implications for language learning.

In conclusion, the comprehensive review and thematic categorization of these studies reveal the diverse approaches and findings in the field of semantics. The integration of articulatory, auditory, acoustic, experimental, practical, and computational aspects offers a holistic understanding of semantic learning. The expected outcomes include improved phonetic theory knowledge, enhanced pronunciation and semantic analysis skills, and the effective use of technology in supporting semantic learning. This comprehensive method can significantly aid students in overcoming challenges in learning semantics and enhance their practical abilities in this field.

4. Discussion (12 pt)

This study set out to conduct a systematic literature review on the topic of semantics to develop a comprehensive and accessible phonetic learning method for students. The review aimed to enhance students' understanding of language sound production, perception, and analysis, and to improve their practical pronunciation and semantic analysis skills. Using the Publish or Perish tool, the study identified and analyzed 21 research papers published between 2019 and 2024. The key findings from these studies underscore the importance of integrating various aspects of phonetics and semantics, including articulatory, auditory, acoustic, experimental, practical, and computational approaches, to create a holistic learning method for students.

The findings of this systematic literature review highlight the multifaceted nature of semantic learning and its crucial role in language education. By categorizing and analyzing studies across different disciplines such as linguistics, computational linguistics, and educational technology, this research underscores the importance of a comprehensive approach to teaching semantics. For instance, studies like those by Alfon Arsay (2023) and Jinghua Zhang (2019) illustrate the practical applications of semantic theories in understanding language nuances and improving communication skills (Arsay, 2023; Zhang, 2019). The integration of computational methods, as seen in the works of Li Zhang and Rada Mihalcea (2019) and Damonte and Monti (2021), further emphasizes the potential of advanced technologies in enhancing semantic research and education (Zhang & Mihalcea, 2019; Damonte & Monti, 2021).

The importance of a comprehensive approach to semantic learning is supported by similar studies in the field. For example, Alshboul and Ghanim's (2021) research on semantic modeling for e-tutor systems aligns with the present study's findings on the effectiveness of integrating educational technology to support learning (Alshboul & Ghanim, 2021). Moreover, Ahmed and Kovács (2021) demonstrate how ontology-based models can enhance learning processes within Learning Management Systems, which corroborates the present study's emphasis on the use of computational tools in semantic education (Ahmed & Kovács, 2021).

While the findings provide strong support for a comprehensive semantic learning method, alternative explanations must be considered. For instance, the variability in students' individual learning styles and cognitive abilities could impact the effectiveness of the proposed methods. Additionally, the integration of advanced computational tools may pose challenges for educators and students who are not technologically proficient. These factors highlight the need for adaptive and flexible teaching approaches that can cater to diverse learner needs.

The present study is not without its limitations. Firstly, the reliance on the Publish or Perish tool, while effective in aggregating a large number of studies, may have resulted in the inclusion of papers with varying degrees of quality and relevance. Secondly, the focus on English-language articles published between 2019 and 2024 excludes potentially valuable research published in other languages or outside this time frame. Lastly, the study's broad scope across multiple disciplines may have led to a less detailed analysis of individual studies, which could impact the depth of the findings.

Future research should address these limitations by incorporating a more diverse range of sources and conducting more detailed analyses of specific aspects of semantic learning. Additionally, longitudinal studies that track the effectiveness of the proposed learning methods over time would provide valuable insights into their long-term impact on students' skills. Further exploration into the integration of emerging

technologies, such as artificial intelligence and machine learning, in semantic education could also offer innovative solutions to enhance learning outcomes.

In conclusion, this systematic literature review provides a comprehensive overview of the current state of semantic research and its applications in language education. By highlighting the importance of integrating various phonetic and semantic aspects, this study lays the groundwork for developing effective and accessible learning methods that can significantly benefit students. Future research should build on these findings to further refine and expand the strategies for teaching semantics, ensuring they are adaptable and inclusive for all learners.

5. Conclusion (12 pt)

This systematic literature review offers a comprehensive overview of the current state of semantic research and its applications in language education. By integrating various phonetic and semantic aspects, the study lays the groundwork for developing effective and accessible learning methods that significantly benefit students.

While the findings provide strong support for a comprehensive semantic learning method, alternative explanations must be considered. The variability in students' individual learning styles and cognitive abilities could impact the effectiveness of the proposed methods. Additionally, the integration of advanced computational tools may pose challenges for educators and students who are not technologically proficient. These factors highlight the need for adaptive and flexible teaching approaches that can cater to diverse learner needs.

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In conclusion, this systematic literature review underscores the importance of a comprehensive approach to teaching semantics. Future research should build on these findings to further refine and expand the strategies for teaching semantics, ensuring they are adaptable and inclusive for all learners.

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