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REVIEW ARTICLE

Systematic Literature Review of Multimodal Classroom Discourse Analysis: An SF-MDA Perspective

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ABSTRACT

Multimodal classroom discourse analysis is critical for understanding how diverse semiotic resources interplay in shaping teaching and learning experiences. This study conducted a systematic review to explore the current status of classroom discourse analysis through the lens of Systemic Functional-Multimodal Discourse Analysis (SF-MDA). It aims to analyze the application of SF-MDA in classroom settings and identify future research directions. The review employed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) method, using keywords in Scopus, Web of Science, and Google Scholar databases. Articles were selected based on strict criteria, including publication dates between 2016 and 2024, focusing on multimodal analysis in classroom contexts. A total of 25 studies from 13 countries were included for detailed analysis. The findings reveal that SF-MDA has been instrumental in uncovering how various semiotic modes—such as gestures, spatial arrangements, and digital tools—interact to construct meanings in classrooms. Despite a predominance of qualitative methodologies, there is a growing trend toward mixed-method designs to systematically assess multimodal teaching effectiveness. Future research can address existing gaps by incorporating quantitative methods, refining analytical tools, and exploring emerging digital modalities to further enhance the understanding of multimodal classroom discourse.

Contribution/Originality: This study contributes to the existing literature by reviewing multimodal classroom discourse from a systemic-functional perspective. It highlights the importance of analyzing metafunctional meanings in digital classroom resources and documents the potential of integrating SF-MDA with educational theories to enhance understanding of multimodal learning processes in the classroom.

1. Introduction

The communication landscape is changing. Teaching and learning in the classroom is a multisensory experience involving more than just language (Lim, 2021a). Previous studies on classroom discourse and teacher-student interactions have primarily concentrated on examining the spoken and written language used in the classroom. Spoken and written language alone do not fully capture the essence of representation, as communication relies on various modes of expression or semiotic resources. In recent years, the study of classroom discourse has increasingly recognized the importance of multimodal communication, including gestures, postures, gaze, facial expressions, images, visual displays, spatial arrangements, and digital technologies (Erfanian Mohammadi et al., 2019; Farsani & Mendes, 2023; Heng, 2017; Lim et al., 2012; Lim, 2021a; Lim & Toh, 2022; Peng, 2019; Qin & Wang, 2021; Samuelsson et al., 2022; Tan et al., 2016). To enhance student learning and foster a more engaging environment, teachers increasingly incorporate different kinds of modes besides spoken and written language into their lessons to contribute to effective teaching and learning (Morell, 2018; Qin & Wang, 2021). The increasing multimodality of contemporary communication has highlighted the need to consider how meanings are constructed not only through language but also through semiotic resources (Jewitt, 2013; Kress, 2015; Zhang, 2015).
Even though Multimodal Discourse Analysis (MDA) was not a familiar concept in the field of linguistics until the early 1990s, it is now an emerging paradigm in discourse studies. MDA has emerged as an important approach to understanding the complex interplay of semiotic resources. Jewitt et al. (2016) explore the field of multimodal research and highlight three primary approaches for studying multimodality: systemic functional linguistics (Bateman, 2014; O'Halloran & Lim, 2014), social semiotics (Kress, 2010), and conversation analysis (Broth & Mondada, 2013; Mondada, 2019). Systemic functional linguistics (SFL), developed by Halliday (1978), focuses on how language is used to create metafunctional meanings within specific social and cultural contexts. SFL is well-placed to provide theoretical tools for MDA because, first and foremost, it is a social semiotic theory where the meaning is seen to be context-dependent. SFL plays a foundational role in shaping the framework of MDA by offering a functional approach to understanding meaning-making processes. Although language has received the most attention in studies of meaning-making, there is now a growing interest and body of research examining multimodal communication (Lim, 2021a). SFL-informed MDA typically involves analyzing a wide range of semiotic resources to understand how they work together to make metafunctional meanings. For instance, the ideational meaning in SFL is adopted in MDA to examine how visual elements represent experiences and concepts, and the interpersonal meaning is extended to explore how body language establishes social roles and relationships. Furthermore, the textual meaning in SFL influences MDA's analysis of how different modes contribute to the coherence and organization of communication across modes.

However, despite its growing application, a comprehensive synthesis of SF-MDA research in classroom contexts remains limited. This study aims to address this gap by providing a systematic literature review of Multimodal Classroom Discourse Analysis (MCDA), with a specific focus on the application of SF-MDA. The primary objectives of this review are threefold:

i. To analyze the key trends and developments in Multimodal Classroom Discourse Analysis (MCDA).
ii. To explore how the Systemic Functional-Multimodal Discourse Analysis (SF-MDA) approach has been applied in classroom teaching and learning.

iii. To identify the challenges and opportunities for future investigations into MCDA adopting SF-MDA.

2. Literature Review

2.1. Semiotic resources, modes, and multimodality

Semiotic resources offer the tools to create meanings by selecting from various modes at a given moment. According to Kress and van Leeuwen (2001), modes, the channel of representation or communication, refers to a set of socially and culturally shaped semiotic resources for making meaning. Jewitt (2013) states that to determine if a set of resources can be considered a mode, it is assessed based on its ability to fulfill all three of Halliday's (1978) meaning functions, that is, ideational meaning (representing experiences), interpersonal meaning (establishing relationships), and textual meaning (organizing messages). This functional approach provides a systemic way to identify and categorize modes.

Some in-depth studies focusing on specific modes have contributed to the initial exploration of these semiotic resources. These studies have helped in describing their material affordances, organizing principles, and cultural references (Jewitt, 2008). Examples of accepted modes include speech (Kress et al, 2005), image, color, and layout (Kress & van Leeuwen, 2006), sound and music (van Leeuwen, 1999), gesture (Hood, 2011; Lim, 2011; Martinec, 2001), posture (Martinec, 2000), gaze (Amundrud, 2018; Harrigan, 2013), facial expression (Martinec, 2001), furniture (Björkvall, & Karlsson, 2011), screens and digital technologies (Jewitt, 2012; Lim & Toh, 2022). Since modes have different affordances, people always use various modes simultaneously to 'orchestrate' complex 'multimodal ensembles' (Bezemer & Jewitt, 2010). The selection of a mode and its corresponding semiotic resources has epistemological consequences as it can shape the way concepts are designed. Consequently, this can impact the potential for interaction in the classroom.

Over the past two decades, research on multimodality has grown significantly, as it sheds light on how speakers and writers convey their intended meanings and purposes (Alyousef, 2020). Multimodality examines the integration of various semiotic resources, or modes, within texts and communicative events, including static and dynamic images, speech, writing, layout, gestures, and positioning (Adami, 2016). Lim (2021a) states, "Multimodality specifically focuses on exploring the interactions and interplay across the semiotic resources in the constellation of meanings made". Multimodality designates a phenomenon that discourse is almost always multimodal, indicating that a range of semiotic modes are integrated in a given instance of discourse (van Leeuwen, 2015). This challenges the traditional framework of categorizing communication as either 'verbal' or 'non-verbal', which usually gives preference to language as the central or primary mode of communication (Lim & Tan, 2018). Jewitt (2013) defines multimodality as an interdisciplinary approach drawn from social semiotics that goes beyond language and recognizes communication and representation in various forms. It emphasizes the systematic examination of how different modes of communication contribute to meaning-making, considering the social interpretation of these diverse forms of expression. Jewitt (2013) also stresses three interconnected theoretical assumptions that form the foundation of multimodality. The first assumption is that "*multimodality steps away from the notion that language always plays the central role in interaction, without denying that it often does*" (Norris, 2004). The second asserts that all

modes have been molded by their cultural, historical, and social utilization to fulfill specific social functions as demanded by different communities. The third is that people orchestrate meaning through their choices of modes. Given the theoretical understandings developed in recent research in multimodality, it is worthwhile to explore how they can be extended to inform the teaching and learning of students in classrooms (Lim & Tan, 2017).

2.2. An SF-MDA approach

According to O'Halloran (2008), Systemic Functional Multimodal Discourse Analysis (SF-MDA) is an approach to analyzing discourse in the social semiotic tradition. SF-informed MDA focuses on the theory and practice of examining meaning derived from the use of various semiotic resources in discourses such as spoken and written language, visual imagery, gesture, architecture, sculpture, and other physical modes (O'Halloran, 2008). The interest in applying SFL theory for MDA has grown steadily, influenced by works like O'Toole's (1994) *Language of Displayed Art* and Kress and van Leeuwen's (1996) *Reading Images: The Grammar of Visual Design*. Later, many other scholars contributed to this area, including Unsworth (2001), Baldry and Thibault (2006), Bateman (2008), Kress et al. (2005), Lemke (2002), Martin (2002), Martinec (2005), O'Halloran (2004), Ventola et al. (2004), Lim (2011).

According to Lim (2021b), the SF-MDA perspective highlights the notion of choice and meaning potential in system networks. The metafunctional framework is especially useful in multimodal studies as it provides a common foundation for integrating and comparing different semiotic resources. The SF-MDA approach adopts a genre-based orientation toward multimodality and is organized around metafunctional meanings, that is, ideational meaning, interpersonal meaning, and textual meaning (Lim, 2018). The SF-informed studies of various semiotic resources include paintings, film, music, visual images, books, websites, newspapers and magazines, space and special organization, gesture and body language, typography and color, digital platforms and interactive technologies (Bateman, 2008, Hood, 2011; Lim et al., 2012; Macken-Horarik, 2004; Martin, 2008). In conclusion, the paradigmatic approach of SF theory to language has established a theoretical foundation for systematically and comprehensively examining semiotic systems beyond language.

The MDA informed by SF theory has been taken up to explore practices in the classrooms across a range of subjects. Earlier studies have investigated how teachers coordinate various modes of communication, such as facial expression, gaze, posture, action with books and boards, and talk, within the classroom (Jewitt, 2013), and the meaning construction has been the focus of much research. O'Halloran (1996) highlighted the semiotic nature of mathematics and its discourse, involving natural language, mathematical symbolism, and visual display in the form of diagrams and graphs. He suggested that the systemic functional model provides a framework to analyze such semiotic systems constructing reality and emphasized the need to examine the joint construction of meaning between codes, leading to the phenomenon of semiotic metaphor. Within Halliday's (1978) meaning-making principles, Kress et al. (2001) conducted an earlier study investigating how science teachers convey subject matter and influence their students' comprehension through interactive classroom teaching and learning processes. They claim that a linguistic description alone cannot fully capture these processes and each mode contributes to the overall meaning of the multimodal ensemble in quite specific ways. Therefore, communication in science

classrooms should include the utilization and mapping of all available visual representational and communicative resources used by teachers and students. The realization of each mode and its meaning construction is also studied in language teaching and learning classrooms. Kress et al. (2005) also examined the meaning making of English classrooms in urban secondary schools in Inner London through the observation of three English teachers' lessons. They stress that the meaning of English language learning is not solely dependent on verbal communication or written expression. Instead, it can be equally influenced by non-verbal modes which play a substantial role in shaping the meaning of English in the learning environment. They claim that in any lesson, multiple modes are used simultaneously: the classroom layout remains more or less fixed, as do the displays on the walls; teachers occupy specific, always meaningful positions within the classroom space; textual objects are present; and usually, though not always, all of this is accompanied by spoken interaction (Kress et al., 2005).

3. Research Method

This study employed a systematic literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The aim was to provide a comprehensive synthesis of existing research on multimodal classroom discourse analysis through the lens of Systemic Functional-Multimodal Discourse Analysis (SF-MDA). This approach was chosen to identify trends, theoretical frameworks, and methodological practices in the field, contributing to a deeper understanding of how multimodal resources are used in educational contexts.

3.1. Search strategy

A comprehensive search strategy was employed to identify relevant studies on multimodal classroom discourse analysis through the lens of Systemic Functional-Multimodal Discourse Analysis (SF-MDA). The search was conducted across academic databases including Scopus, Web of Science, and Google Scholar. As is shown in Table 1, Keywords and Boolean operators were strategically used to refine the search by combining terms such as ("Multimodal Discourse Analysis" OR "Multimodal Classroom Discourse" OR "Semiotic Resources" OR "Multimodality " OR "Modes") AND ("Systemic Functional Linguistics" OR "SF-MDA" OR "Systemic Functional-Multimodal Discourse Analysis") AND ("Classroom" OR "Educational Contexts" OR "Teaching and Learning"). These search terms were carefully chosen to capture studies focusing on the integration of multiple semiotic resources within classroom contexts.

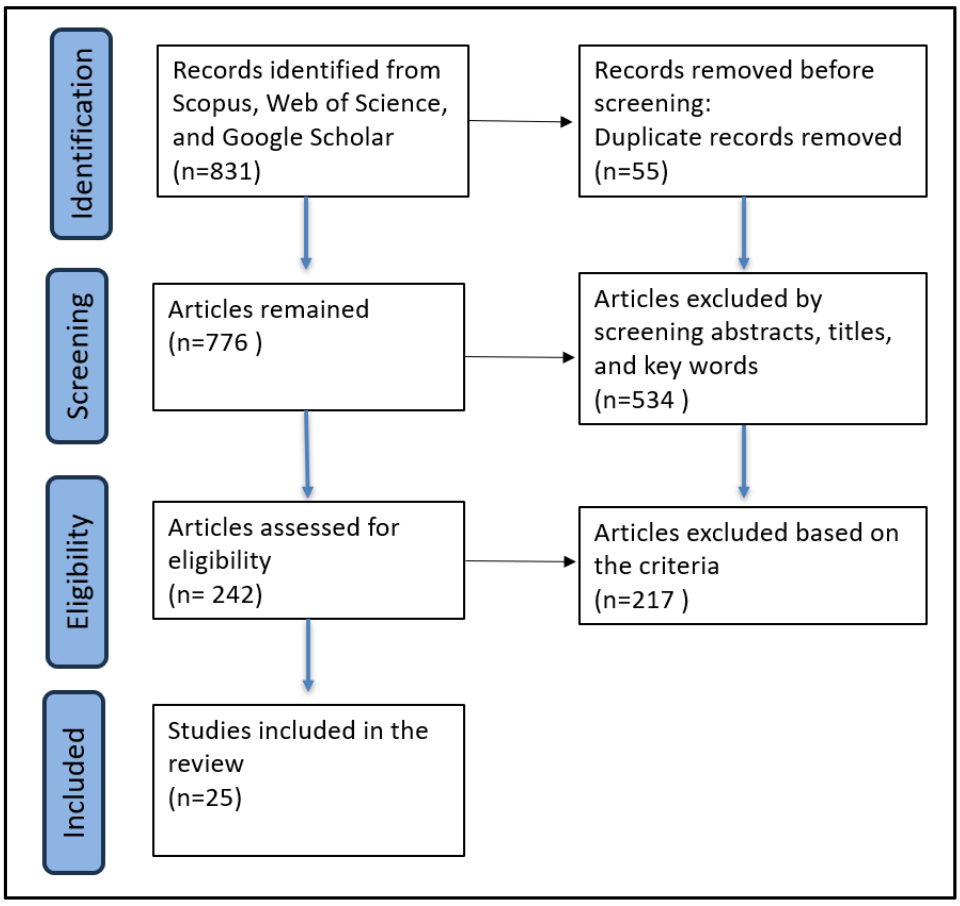
Table 1: The search string

Databases	Keywords
Scopus	TITLE-ABS-KEY (("Multimodal Discourse Analysis" OR "Multimodal Classroom Discourse" OR "Semiotic Resources" OR "Multimodality " OR "Modes") AND ("Systemic Functional Linguistics" OR "SF-MDA" OR "Systemic Functional-Multimodal Discourse Analysis") AND ("Classroom" OR "Educational Contexts" OR "Teaching and Learning"))
Web of Science	TS= (("Multimodal Discourse Analysis" OR "Multimodal Classroom Discourse" OR "Semiotic Resources" OR "Multimodality " OR "Modes") AND ("Systemic Functional Linguistics" OR "SF-MDA" OR "Systemic Functional-Multimodal Discourse Analysis") AND ("Classroom" OR "Educational Contexts" OR "Teaching and Learning"))

Google Scholar	"multimodal classroom discourse" "systemic functional multimodal discourse analysis" "SF-MDA" "classroom multimodality"

To ensure the inclusion of contemporary research, the search was limited to articles published between 2016 and 2024, reflecting the latest developments and applications of SF-MDA in multimodal classroom discourse analysis. Additionally, only studies published in English were considered to maintain consistency and enable a comprehensive comparative analysis. Manual searches of reference lists from the identified studies were also conducted to locate additional relevant literature. This systematic approach ensured that all potential sources were thoroughly examined, enhancing the reliability of the review. The systematic search strategies comprised three main processes: identification, screening, and eligibility. These steps highlight the significance of maintaining rigor and consistency to ensure credible and valid research outcomes (Vrabel, 2015). The overall search strategy is illustrated in Figure 1.

Figure 1: The flow chart of the review process



3.2. Inclusion and exclusion criteria

Defined inclusion and exclusion criteria were applied to guarantee the selection of pertinent and high-quality studies. The inclusion and exclusion criteria were given in Table 2. These inclusion and exclusion criteria were applied during the screening and selection process to ensure the reliability and validity of the systematic review. They contributed to maintaining a clear focus on multimodal classroom discourse analysis within the framework of SF-MDA, thereby enhancing the relevance and contribution of the review to the field of classroom semiotics.

Table 2: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Empirical studies	Non-empirical studies
Published in English	Published in other languages
In classroom contexts	In other contexts
Published between 2016 and 2024	Published before 2016
Systemic functional approach	Social semiotic approach, conversation analysis approach
Available as full text	Not available as full text

4. Results

A total of 25 studies that adopted the SF-MDA approach in classroom settings were reviewed. The summary of the included studies is presented in Table 3.

Table 3: Summary of the included studies

	Author & Year	Country	Classroom	Modes	Type
1	Lim (2021b)	Singapore	English General Paper lesson	Language, gestures	Qualitative
2	Peng et al. (2016)	China	English as a Foreign Language classroom	Language, gestures, gaze	Qualitative
3	Lim (2019)	Singapore	English General Paper lesson	Gestures	Qualitative
4	Erfanian Mohammadi et al. (2019)	Iran	Teaching English as a Foreign Language	Gaze, gestures, digital tools	Qualitative
5	Peng (2019)	China	English as a Foreign Language classroom	Audio/video, visual design of PPT slides, voice/facial expressions, gestures, spatial position	Quantitative
6	Morell (2018)	Spain	An EMI-based (English Medium Instruction) lesson	Space, gaze, gestures, spoken/written language	Qualitative
7	Fernández-Fontecha et al. (2020)	Spain	Science classroom	Textbooks (text and images)	Qualitative
8	Feng (2021)	China	English micro-lectures	Sounds, facial expressions, gestures, teaching aids	Qualitative
9	Shin et al. (2020)	The U.S.	Second language writing	PowerPoint slides (language and image)	Qualitative
10	Taylor (2016)	The U.K.	English Literature	Gaze, gestures, posture, speech	Qualitative

11	Yunita et al. (2022)	Indonesia	English language class	Gestures	Qualitative
12	Alyousef (2020)	Saudi Arabia	Oral Biology course	Text images	Qualitative
13	Unsworth and Mills (2020)	Australia	English as an Additional Language class	Language and image	Qualitative
14	Lindenberg (2023)	Japan	Applied linguistics	Language, gestures, head movement, slides	Qualitative
15	Amundrud (2022)	Japan	English as a Foreign Language class	Space, gaze, gestures	Qualitative
16	Liu (2022)	China	L2 classroom	Emotions	Qualitative
17	Huang and Ma (2024)	China	English classroom	Visual, auditory, and actional modes	Qualitative
18	Herman et al. (2023)	Indonesia	English classroom	Textbooks (text and images)	Qualitative
19	Mustofa et al. (2023)	Indonesia	English as a Foreign Language classroom	Language, pictures, video, proxemics, gestures, head movement, gaze, music	Qualitative
20	Danielsson (2016)	Sweden	Science classroom	Language, gestures, images	Qualitative
21	Morell et al. (2022)	Spain	An EMI-based (English Medium Instruction) lesson	Language, space, posture, NVMs	Qualitative
22	Kim et al. (2021)	The U.S.	English class	Digital stories	Qualitative
23	Heng (2021)	Malaysia	Chinese as a Second Language Classroom	Language, facial expressions, gaze, postures, gestures	Qualitative
24	Abdelrahim (2024)	Saudi Arabia	English classroom	Language, visual resources, aural resources, gestures	Qualitative & quantitative
25	Saeed & Shaikh (2024)	Pakistan	English Language classroom	Language, gesture, space	Qualitative & quantitative

The following discussions mainly present the key trends in multimodal classroom discourse analysis and the adoption of the SF-MDA approach of analyzing various semiotic modes in classroom teaching and learning.

4.1. Trends and developments in MCDA

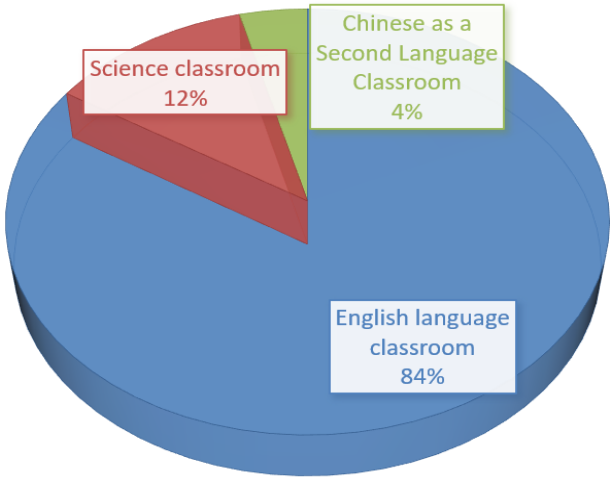
Multimodal classroom discourse analysis has witnessed diverse trends across countries, classroom contexts, modes of communication, and research methodologies. From the geographic distribution and classroom settings, it can be seen from Table 4 that the research spans 13 countries, including China, Spain, Indonesia, the U.S., Japan, Saudi Arabia, Singapore, Malaysia, and others. China and Indonesia have the highest number of

studies focusing on English as a Foreign Language (EFL) classrooms. Spain has related studies on English Medium Instruction (EMI) and science classrooms. Studies from the U.S. and the U.K. emphasize multimodal aspects in writing and literature classrooms. As is shown in Figure 2, most studies examine English language classrooms. Non-English subjects include Science classrooms and Chinese as a Second Language classrooms.

Table 4: The geographic distribution

Country	n
China	5
Indonesia	3
Spain	3
The U.S.	2
Singapore	2
Japan	2
Saudi Arabia	2
Malysia	1
The U.K.	1
Australia	1
Sweden	1
Pakistan	1
Iran	1

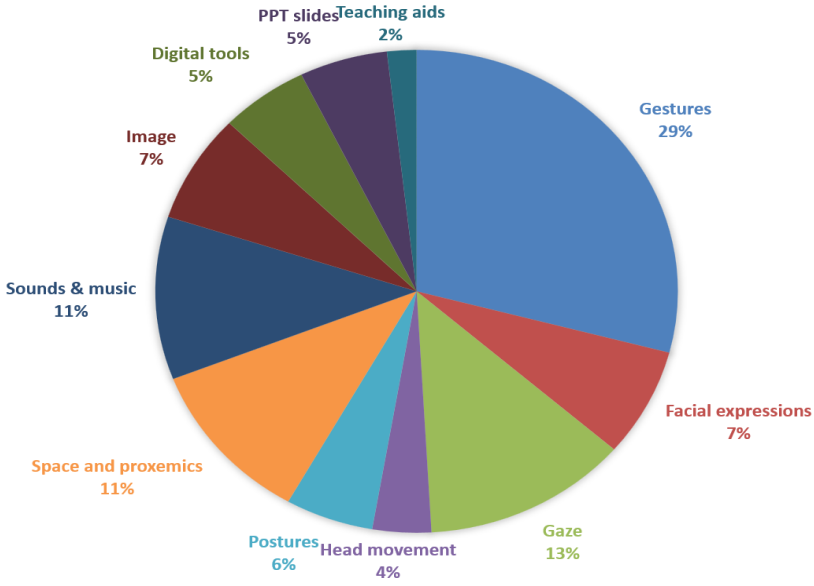
Figure 2: The classroom contexts



From the distribution of non-verbal communication modes, as shown in Figure 3, gestures are the most frequently utilized resource, indicating their crucial role in conveying meaning and facilitating student engagement. When understanding and interpreting gestures, it is essential to analyze them in relation to the speech that accompanies them (Qin & Wang, 2021). Other significant resources include space and proxemics. According to Lim (2011, 2021a), the teacher's position in the classroom serves as a crucial material site where semiotic resources, such as gestures, language, and other modes, are embodied and realized. Gaze, especially engaged gaze, is mostly studied because it fosters student involvement and regulates turn-taking, signaling interest and encouragement (Peng et al., 2016; Qin & Wang, 2021). Facial expressions also contribute to meaning-making, though to a lesser extent than gestures, because teachers' facial expressions directly reflect their attitudes toward students. Additionally, digital tools and PPT slides indicate a blended approach that integrates bodily movements and technology in instructional practices. The least utilized resources, head

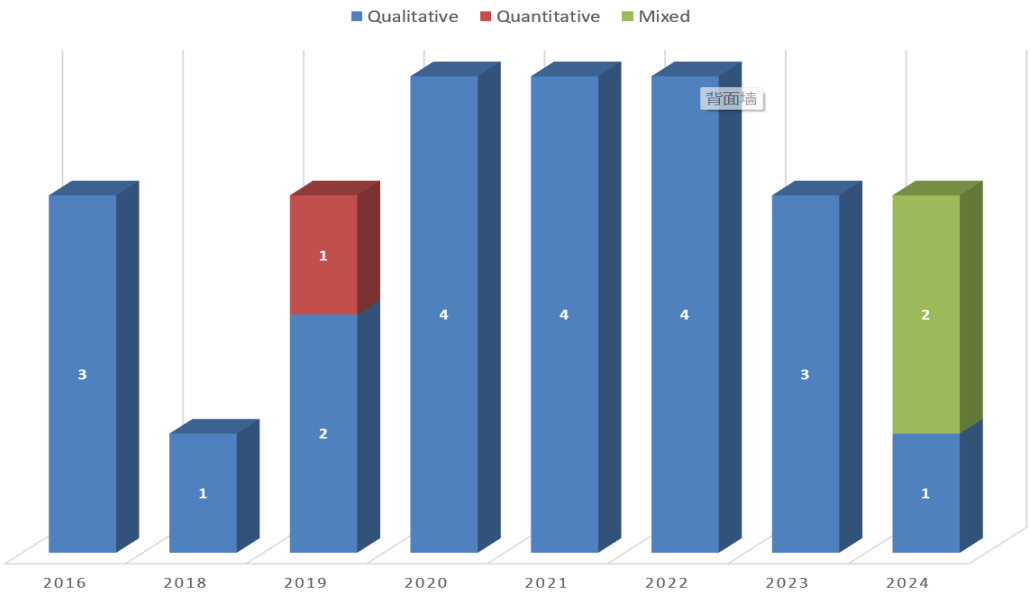
movement and teaching aids, appear to play a more supplementary role. The findings also suggest that while digital tools are present, classroom teaching and learning remain highly interactive, with a strong reliance on physical and visual cues.

Figure 3: The non-verbal modes of communication



From the research methodology, as shown in Figure 4, the predominant methodological approach across these studies is qualitative, employing classroom observations, writing field notes, and semi-structured interviews with teachers and students to capture the interplay of multiple modes and the intended meanings; however, a few studies from China, Saudi Arabia, and Pakistan signal a shift towards integrating quantitative methods, which suggests an effort to systematically measure the impact of multimodal strategies on student engagement and learning outcomes.

Figure 4: The research design



4.2. SF-MDA application in classroom teaching and learning

The SF-MDA framework has been instrumental in understanding how multiple modes work together to construct metafunctional meanings in educational settings. Many studies explore the role of gestures, space, and positioning in facilitating comprehension. Lim (2019, 2021b) employs the SF-MDA approach to explore the categories of gestures and how language and gesture interact to create a cohesive and coherent multimodal classroom discourse. He proposes the theoretical apparatus for the annotation and analysis of teachers' use of gestures in the classroom. Teachers' positioning in the classroom is crucial for establishing authority, facilitating interaction, and managing the learning space. By choosing a visible and central location, teachers assert their leadership, using non-verbal cues—such as confident posture and purposeful movement—to reinforce their role and command attention. In addition to physical gestures and spatial positioning, digital tools also play a significant role in shaping classroom discourse. Peng (2019) and Shin et al. (2020) highlight how digital tools and PowerPoint slides offer a range of meaning-making resources—including words, images, music, and videos—that support writers in composing texts. These tools not only enhance the representation of knowledge but also contribute to a more interactive and engaging learning environment.

5. Discussions

5.1. Key findings

This systematic literature review has examined the application of SF-MDA in the study of classroom discourse. The findings reveal a growing recognition of multimodal resources as essential to meaning-making in classroom settings. Studies predominantly focus on how spoken and written language interact with other semiotic resources, such as gestures, spatial arrangements, images, and digital tools, to shape student learning experiences.

One of the important developments in multimodal classroom discourse analysis is the increasing call for a methodological shift that combines qualitative and quantitative approaches. While earlier studies predominantly relied on qualitative methods to explore multimodal meaning-making, recent research, such as that by Abdelrahim (2024) and Saeed and Shaikh (2024), has begun incorporating quantitative techniques to provide a more systematic and data-driven understanding of multimodal teaching effectiveness. The combination of these two approaches allows for a more comprehensive analysis, capturing both the depth of multimodal interactions and the measurable impacts on student learning outcomes. Moving forward, multimodal research should embrace mixed-method designs, utilizing advancements in corpus linguistics, computational modeling, and eye-tracking technologies to refine its analytical precision further.

Another notable trend is the increasing integration of digital semiotic tools into classroom discourse, broadening the scope of multimodal teaching and learning analysis. Studies have highlighted how emerging technologies—such as interactive whiteboards, educational apps, and AI-powered learning platforms—mediate teacher-student interactions and influence meaning-making processes (Kim et al., 2021; Lim & Toh, 2022; Twiner et al., 2021). Semiotic technologies involve what they are and how they are used, which are used to facilitate the representation of knowledge and the expression of

pedagogic relations (Lim, 2021a). In the classroom context, technological tools serve as a way to convey ideas and experiences, representing relations between teachers and students, and playing a role in organizing the overall learning. This growing integration of digital semiotic tools into classroom discourse continually transforms teaching and learning practices, enhancing the multimodal nature of knowledge construction and communication.

5.2. Theoretical implications

Additional SF-MDA frameworks need to be put forward to examine semiotic technologies that facilitate the construction of meanings in contemporary classrooms. According to Ravelli and van Leeuwen (2018), the introduction of new technological possibilities, such as new modes, multiple distribution platforms, and increased user control over variables, raises inquiries regarding the significance of modality in modern communication practices. As a result, the existing theoretical frameworks need to be adjusted and further developed to accommodate these changes**.** Lim (2021a) also explores the value of digital semiotic technologies and examines the new possibilities that emerge when tools such as learning analytics, digital platforms, and educational apps are integrated into a personalized computing environment. Although some meaning-making frameworks for analyzing semiotic technologies, such as whiteboards, platforms, PowerPoint, and apps, have been put forward by researchers (Lim, 2021a; Lim & Toh, 2022; Poulsen et al., 2018). The new phenomenon of digital technologies demands new theoretical tools, and a persistent challenge for researchers in multimodal discourse is to create a comprehensive theoretical framework that effectively addresses the interaction among diverse semiotic resources (Lim, 2019; Toh & Lim, 2021).

5.3. Pedagogical implications

This study also highlights the potential for integrating SF-MDA with other educational theoretical frameworks to deepen the understanding of multimodal learning processes. While SF-MDA provides a powerful framework for analyzing meaning construction across different semiotic resources, combining it with theories such as Cognitive Load Theory, Engagement Theory, and Sociocultural Theory could offer valuable insights into how multimodal inputs influence student cognitive processing, study motivation, and social interaction in the classroom (Hafner, 2024; Qin & Wang, 2021; Salmani & Rahimi, 2024). Such interdisciplinary approaches would enhance the explanatory power of multimodal research, enabling teachers to design more effective instructional strategies tailored to diverse learning needs.

5.4. Limitations of the study

This review has certain limitations that should be acknowledged. The selection of literature was confined to studies published in peer-reviewed journals and indexed databases, potentially excluding relevant but unpublished or non-indexed research. Additionally, it limits insights from research published in other languages, as the included studies were written in English.

6. Conclusion

In conclusion, this systematic literature review highlights the significant contributions of SF-MDA to understanding multimodal classroom discourse. By revealing how various

semiotic resources interact to construct meaning, SF-MDA offers valuable insights into teaching and learning dynamics. Nevertheless, there are still gaps to address, including the need for more quantitative research designs, the development of enhanced digital modes for analysis, and the creation of SF-MDA theoretical frameworks or models to capture emerging digital modalities. Future research should aim to fill these gaps, thereby refining both the theoretical foundations and practical applications of SF-MDA in classroom settings.

Ethics Approval and Consent to Participate

Not applicable

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this research.

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