European Journal of Open Education and E-learning Studies
ISSN: 2501-9120
ISSN-L: 2501-9120
Available on-line at: www.oapub.org/edu

DOI: 10.46827/ejoe.v10i3.6106 Volume 10 | Issue 3 | 2025

REFRAMING MULTIMODALITY IN CONTEMPORARY EDUCATION: A CRITICAL REVIEW OF RESEARCH PATTERNS AND PEDAGOGICAL SHIFTS

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Abstract:
This paper explores the evolving role of multimodality in education, highlighting its shift from a focus on digital learning environments to a broader pedagogical paradigm. Multimodality, rooted in social semiotic theory, recognises meaning as constructed through diverse modes—text, image, sound, gesture—making it essential for modern teaching and learning. Technological advancements and cultural pluralism have reinforced the need for multimodal pedagogies that support learner agency, inclusivity, and critical literacy. The study draws from the multiliteracies framework to argue that traditional language-centred education must expand to accommodate complex, multimodal communication practices. It positions the learner not as a passive recipient but as an active designer of meaning, capable of selecting and combining semiotic resources to communicate and learn. Multimodal learning is particularly relevant in multilingual and multicultural settings, where expressive diversity enhances identity formation and cross-cultural understanding. Recent literature advocates for integrating multimodality into teacher education and classroom practice, particularly through project-based and collaborative digital activities. In these contexts, learners develop critical literacies by navigating and producing multimodal texts across platforms and modes. The paper also calls for the integration of adjacent concepts such as multiplicity, hybridity, and cognitive complexity into multimodality research. These dimensions can enrich understanding of how learners from diverse backgrounds construct knowledge using a mix of cultural and semiotic resources. Methodologically, the study supports mixed-methods and participatory approaches to capture the depth of multimodal interaction. Ultimately, the authors propose a reimagining of multimodality as a foundational principle in 21st-century education—one that supports equitable, creative, and reflexive learning ecosystems across disciplines and educational settings.

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Keywords: multimodal education, learner agency, semiotic theory, pedagogical innovation

1. Rethinking Multimodality in Education

In recent decades, the field of education has undergone significant transformation, driven by technological innovation, cultural diversity, and the increasing complexity of communicative practices. At the heart of these changes lies the concept of multimodality—the recognition that meaning is not conveyed through language alone, but through an orchestration of multiple semiotic modes, including image, sound, gesture, spatial design, and digital interface. Multimodality, therefore, offers a dynamic framework for rethinking teaching and learning in digitally mediated societies, demanding not only new literacy practices but also a fundamental reorientation of pedagogical theory and curriculum design (Kress & van Leeuwen, 2001; Jewitt, Bezemer, & O'Halloran, 2016).

Grounded in social semiotic theory, multimodality posits that all modes of communication are socially and culturally produced, situated, and interpreted. According to Kress (2009), meaning is not inherent in signs themselves but arises through the interaction between semiotic resources and the social environments in which they are deployed. This view challenges traditional monomodal paradigms of education, which have long privileged written language and verbal communication, by expanding the pedagogical field to encompass the full spectrum of sensory and symbolic expression (Bezemer & Kress, 2016).

The emergence of digital technologies has been pivotal in mainstreaming multimodality within educational discourse. Digital environments inherently afford multimodal design: learners today engage with information not only through text but also through images, videos, animations, interactive simulations, and real-time collaborative tools. As Bernsen (2008) suggests, the shift from unimodal to multimodal interactive systems has opened new research pathways and pedagogical possibilities, fundamentally altering the nature of educational content and the modes through which learners make sense of the world.

However, multimodality is not merely a technical development. It reflects deeper shifts in how knowledge is constructed and communicated in the 21st century. Cope and Kalantzis (2015) argue that the pedagogy of multiliteracies—closely linked to multimodality—recognises that literacy practices today must accommodate cultural and linguistic diversity, critical thinking, and digital fluency. From this standpoint, multimodal education becomes both a response to and a strategy for addressing the challenges of globalisation, equity, and learner diversity.

A crucial insight offered by contemporary multimodal research is its capacity to support learner-centred pedagogies. In contrast to traditional, teacher-directed models of instruction, multimodality enables a more participatory and creative learning process, where students can co-construct knowledge using diverse representational tools. Lim

(2024) emphasises that multimodality fosters student agency by allowing learners to choose modes that align with their experiences, cognitive styles, and cultural identities. This aligns with constructivist principles, according to which meaningful learning occurs when individuals are actively engaged in producing artefacts that are socially and personally meaningful (Jonassen & Land, 2000).

Moreover, multimodality offers unique potential for inclusive education. By diversifying the means of representation and expression, it reduces the dominance of language-dependent forms of assessment and opens up access for learners with different needs and abilities (Beltrán-Palanques & Bernad-Mechó, 2024). For example, visually impaired learners may benefit from haptic and auditory feedback in multimodal learning environments (Saarinen *et al.*, 2005), while neurodiverse learners may engage more effectively through gamified, image-based, or music-enhanced activities (Grannäs & Stavem, 2021). Multimodality thus contributes to a more equitable educational landscape, one that recognises the plurality of ways in which knowledge can be demonstrated and understood.

Importantly, multimodality is deeply connected to self-regulated learning, a construct that highlights learners' capacity to manage their own cognitive, emotional, and motivational processes. According to Pintrich (2000) and Schunk & Zimmerman (2008), self-regulated learning is enhanced when learners are provided with diverse pathways and representations for engaging with content. Multimodal designs—such as visual timelines, audio reflections, and collaborative concept maps—enable students to personalise their learning trajectories and reflect more critically on their understanding.
To fully realise its transformative potential, multimodality must be embedded not only in classroom practices but also in the epistemological assumptions that underlie educational research and policy. Educators and institutions need to shift from viewing multimodality as an ancillary feature of digital tools to recognising it as a core principle of contemporary pedagogy. This involves rethinking curricula, redesigning assessment frameworks, and investing in professional development that equips teachers with the skills to create and evaluate multimodal learning experiences (Lambropoulos & Kampylis, 2009).

Moreover, future research should expand the theoretical scope of multimodality to include adjacent concepts such as multiplicity, complexity, and cultural hybridity. As Snyder (2001) and Gee (1996) have argued, meaning-making in digital environments is always socially situated and ideologically embedded. Understanding how multimodal practices intersect with power relations, identity formation, and social equity is critical for developing more just and responsive educational systems. Rethinking multimodality in education is not simply about integrating more visual or digital content into teaching. It is about embracing a broader pedagogical vision that values diversity, fosters critical engagement, and promotes learner agency. As the educational landscape continues to evolve, multimodality offers a robust and flexible framework for designing inclusive, meaningful, and transformative learning experiences. However, realising this vision

requires sustained scholarly attention, interdisciplinary collaboration, and a commitment to reshaping educational practice at all levels.

2. Context and Multiliteracies

In an era of unprecedented digital innovation, global mobility, and cultural complexity, traditional definitions of literacy are no longer adequate to meet the demands of contemporary education. The emergence of multiliteracies, a term coined by the New London Group in the late 1990s and further developed by scholars such as Cope and Kalantzis (2015), marks a critical turn in literacy theory. It signifies a pedagogical shift from viewing literacy as the acquisition of a single, standardised mode of language use, toward recognising and embracing the diverse, multimodal, and culturally situated forms of communication that learners encounter in everyday life.

This reconceptualisation of literacy is deeply intertwined with the theoretical framework of multimodality, which recognises that meaning is made through the orchestration of multiple semiotic modes—linguistic, visual, spatial, gestural, and auditory. Multimodality, rooted in social semiotic theory, foregrounds the role of context, culture, and social interaction in shaping communication (Kress & van Leeuwen, 2001; Bezemer & Kress, 2016). By integrating multimodality within the broader paradigm of multiliteracies, educators and researchers can develop pedagogical models that foster critical literacy in complex, multimodal environments.

According to Cope and Kalantzis (2015), the pedagogy of multiliteracies is underpinned by four key dimensions: situated practice, overt instruction, critical framing, and transformed practice. These components aim to scaffold learners' engagement with real-world texts, facilitate awareness of how meaning is socially constructed, and empower students to remix and transform knowledge in ways that are personally and culturally meaningful. Within this framework, multimodal design becomes a central educational strategy—an invitation for learners to move beyond traditional alphabetic literacy and engage with the full spectrum of semiotic resources available to them.

Adami (2016) highlights that in multimodal communication, meaning is never fixed or neutral but emerges through the dynamic interaction between modes, contexts, and users. This theoretical insight is particularly relevant for educators seeking to cultivate critical literacies in students. In digital contexts, for example, learners must be able not only to decode texts but also to interpret images, navigate hyperlinks, evaluate audio-visual arguments, and critically assess how design influences interpretation. Such competencies cannot be developed through monomodal instruction alone. Instead, they require a pedagogy attuned to the complexities and affordances of multimodal communication.

Lim (2024) elaborates on this by arguing that the multimodal turn in higher education is not merely about adopting digital tools but about rethinking epistemological assumptions and pedagogical intentions. In his analysis of multimodal approaches in

EMI (English-Medium Instruction) contexts, Lim demonstrates how multimodal pedagogy enables learners to express nuanced understandings, especially in multilingual or multicultural settings where language alone may not capture the full range of students' thoughts and identities. In this sense, multimodal practices support inclusive and equitable learning, allowing diverse learners to draw upon their own semiotic repertoires and cultural backgrounds.

One of the most powerful implications of combining multiliteracies and multimodality is the recognition of agency in the learning process. Traditional literacy education often positions students as passive recipients of knowledge, whereas multimodal multiliteracies approaches emphasise the learner as an active designer of meaning. As Kress (2009) asserts, meaning-making in a multimodal world requires that learners be able to select, adapt, and orchestrate modes to suit specific purposes, audiences, and contexts. This design-based perspective aligns with constructivist and participatory pedagogies, where learners are co-creators of knowledge rather than consumers.

Moreover, the pedagogical value of multimodal multiliteracies lies in its capacity to prepare learners for real-world communication, which is increasingly hybrid and transmedia. In the digital landscape, users move fluidly between podcasts, blogs, memes, videos, infographics, and social media posts—each with its own conventions, expectations, and modal emphases. Teaching students how to navigate, produce, and critically engage with such texts is essential for developing 21st-century competencies (Jewitt, 2008; Cope & Kalantzis, 2015).

From a classroom perspective, this paradigm invites the integration of multimodal text production—such as digital storytelling, video essays, graphic novels, and web-based portfolios—into everyday learning experiences. Lim and Tan (2021), in their study of Singaporean classrooms, found that when teachers incorporated images and visual media into literacy instruction, students demonstrated more robust comprehension and engagement. Similarly, Di Cesare and Rowsell (2020) advocate for multimodal literacy education that goes "beyond print," arguing that learners must be equipped to read and write across a variety of symbol systems.

At the same time, teaching multiliteracies in multimodal contexts requires educators to rethink assessment. Conventional written tests and essays may not capture the depth or breadth of students' understanding when learning involves visual, spatial, or performative modes. As Adami (2016) and Bezemer & Kress (2016) suggest, assessment practices must evolve to include criteria such as coherence across modes, purposeful design choices, and the communicative effectiveness of multimodal texts. Rubrics may be needed that reflect multimodal dimensions—layout, colour use, image-text relationship, navigation structure, and audience engagement.

Importantly, critical literacy within this framework involves not only analysing multimodal texts but also interrogating the ideological work they perform. Drawing on Gee (1996), we understand that discourses—whether visual, textual, or audio—reproduce certain power relations, values, and social identities. For example, a media

advertisement may implicitly communicate gender norms through colour, gaze, and layout as much as through words. Multimodal literacy education should therefore encourage students to question how meanings are shaped and whose perspectives are represented or marginalised. This also means recognising that access to multimodal learning is uneven. As Snyder (2001) notes, the digital divide and broader sociotechnical inequalities shape students' capacity to participate in multimodal literacies. Schools must address not only the availability of hardware and software but also the development of critical digital skills, ethical awareness, and cultural sensitivity. Equipping learners to navigate multimodal environments thus becomes a matter of educational justice.

Furthermore, multimodal multiliteracies align with transdisciplinary approaches to education. They connect literacy with art, media, music, design, and critical theory, offering holistic ways of knowing that transcend compartmentalised curricula. For instance, learners studying a historical event might be invited to create a podcast, illustrate a graphic timeline, and write a reflective narrative, thereby engaging multiple cognitive and emotional pathways. This kind of learning is not only deeper but also more memorable and personally meaningful (Grannås & Stavem, 2021; Lambropoulos & Kampylis, 2009).

In conclusion, situating multimodality within the multiliteracies paradigm offers a powerful lens for educational transformation. It moves literacy education from static, print-based conventions toward dynamic, multimodal, and culturally responsive pedagogies. Drawing on the insights of scholars such as Cope and Kalantzis (2015), Adami (2016), Lim (2024), and Bezemer & Kress (2016), educators are encouraged to embrace a pedagogy of design—one that values learner agency, critical reflection, and multimodal expression. In doing so, they can equip students not only to decode the world but also to redesign it in ways that are inclusive, ethical, and creatively empowered.

3. Patterns of Scholarly Engagement

Despite the increasing prominence of multimodality as a key theoretical and pedagogical construct within contemporary educational discourse, scholarly engagement with the concept presents a complex and uneven landscape. Multimodality, with its capacity to illuminate meaning-making processes across diverse semiotic modes—visual, auditory, gestural, spatial, and linguistic—has been widely recognised as a transformative perspective in education, particularly in contexts of literacy, digital learning, and arts integration. However, a closer bibliometric analysis reveals that this conceptual enthusiasm has not been matched by an equally robust or systematic research infrastructure.

While foundational texts by scholars such as Kress (2010), Jewitt (2008), and the multiliteracies framework by Cope and Kalantzis (2009) have shaped the theoretical underpinnings of the field, the volume of empirical research remains relatively modest. Studies tend to be concentrated within specific disciplines—most notably education, linguistics, and communication—leaving other fields, such as educational technology,

STEM education, or policy studies, comparatively underrepresented. This disciplinary asymmetry limits the transversality and integration of multimodality across the broader educational research ecosystem.

In terms of citation distribution and academic reach, a small number of core articles accumulate a significant portion of citations, while the majority of contributions remain under-cited or peripheral. Such concentration indicates a potential over-reliance on foundational sources without the parallel development of diverse or practice-based extensions. Moreover, the geographical distribution of research outputs also exhibits imbalances, with Anglo-American and Northern European institutions leading in publication activity, while contributions from the Global South remain limited, both in volume and visibility.

This fragmented and asymmetrical scholarly engagement raises important questions about the consolidation of multimodality as a transdisciplinary research agenda. While its conceptual richness and applicability are widely acknowledged, its evolution as a fully-fledged field of inquiry is still in progress. Critical efforts are needed to foster cross-disciplinary dialogues, encourage methodological innovation, and promote inclusion of culturally diverse epistemologies. Without such initiatives, there is a risk that multimodality will remain a niche framework, rather than fulfilling its potential as a unifying and dynamic lens for 21st-century educational research and practice.

4. Shifting Focus: From Learning Environments to Pedagogical Praxis

Over the past two decades, the landscape of multimodality research in education has undergone a significant transformation. Bibliometric and citation-based analyses, particularly those employing the Field-Weighted Citation Impact (FWCI) metric, reveal not only quantitative trends but also a qualitative shift in the thematic orientation of scholarly work. Early research on multimodality in education tended to concentrate on the technological affordances of learning environments—virtual reality, user interfaces, and multimedia platforms. However, more recent publications increasingly direct attention toward pedagogical praxis, inclusive learning, and digital content creation. This evolution reflects broader shifts in global educational discourse, which has gradually moved away from tool-centric paradigms toward learner-centred, participatory, and humanistic frameworks of teaching and learning.

Initially, the rise of digital technology in education spurred research on how multimodal learning environments could enhance cognitive engagement and information retention. Foundational works such as Moreno and Mayer's (2007) study on interactive multimedia systems framed multimodality through the lens of cognitive load theory and dual-channel processing. Their research, which remains the most cited in the field with a FWCI of 8.08, demonstrated that combining visual and verbal modes in digital instruction could improve learning outcomes under specific design conditions. However, while these studies were instrumental in establishing the empirical legitimacy

of multimodal design, they often privileged information transmission over social interaction or contextual meaning-making.

As the field matured, scholars began to question the limitations of technologically deterministic approaches. Kress (2009) and Bezemer & Kress (2016) proposed a social semiotic theory of multimodality that reoriented attention from devices and delivery systems to the communicative practices of learners and educators. According to this view, modes are not just tools for encoding information, but cultural resources shaped by context, ideology, and social relations. This theoretical repositioning allowed researchers to interrogate how multimodal meaning-making unfolds within specific pedagogical settings and how power, identity, and agency intersect in the classroom.

The shift from focusing on learning environments to multimodal pedagogy also parallels the evolution of the broader educational agenda. Increasingly, educational systems around the world emphasise creativity, collaboration, emotional intelligence, and inclusivity—dimensions that traditional learning management systems and test-based pedagogies are ill-equipped to support (Grannås & Stavem, 2021). In this new context, multimodality is not just a matter of choosing the right media but of designing meaningful learning experiences that engage the whole learner—intellectually, emotionally, and socially.

Recent research underscores this transition. Studies by Lim (2024) and Lim, Towndrow & Tan (2023) show how teachers implement multimodal pedagogies in primary and secondary classrooms to support English language learners. Rather than focusing solely on comprehension or grammar, these pedagogical approaches involve students in creating multimodal texts—posters, videos, narratives, digital stories—that enable them to express themselves using various semiotic resources. Such practices not only improve language acquisition but also foster student agency and cross-cultural communication skills.

In a similar vein, Melenets, Shcherbyna and Kulbediuk (2024) explore how multimodal strategies can be employed in the professional development of early childhood educators. Their work reveals that when teachers are trained to use multimodal content creation—combining voice, gesture, drawing, and movement—they are more likely to adopt inclusive, differentiated practices in the classroom. These practices align with Universal Design for Learning (UDL) principles, which advocate for multiple means of engagement, representation, and expression to accommodate diverse learners (CAST, 2018).

This transition toward pedagogical praxis also brings to the forefront the ethical and affective dimensions of teaching. Educational research now increasingly recognises the importance of learner well-being, empathy, and social belonging as integral to the learning process (Grannås & Stavem, 2021). Multimodal pedagogies that include expressive arts, storytelling, and embodied learning offer a unique platform for supporting these goals. For instance, visual and kinesthetic modes allow students who struggle with verbal or written communication to participate more fully in classroom discourse, thus contributing to a more inclusive educational environment.

The implications of this pedagogical turn are also evident in the design of the curriculum and assessment. While traditional assessments often privilege linguistic accuracy and logical argumentation, multimodal assessment allows for more holistic and differentiated forms of evaluation. Projects involving digital portfolios, collaborative video production, or interactive storytelling not only assess content knowledge but also transversal competencies such as teamwork, design thinking, and critical reflection (Cope & Kalantzis, 2015). This redefinition of assessment challenges educators to develop new criteria that can capture the complexity and creativity of student learning across multiple modes.

Moreover, the turn to pedagogical praxis has also reinvigorated discussions about teacher identity and professionalism. Lim (2024) argues that teachers who integrate multimodal strategies into their instruction must themselves become multimodal designers—critically aware of the affordances and constraints of each mode, and capable of orchestrating them to support specific learning objectives. This perspective requires a shift in teacher education programmes, where multimodal literacy should be taught not as an add-on but as a core pedagogical skill.

Despite these advances, several challenges remain. One is the persistent gap between theory and practice. While academic literature offers rich conceptualisations of multimodality, many educators still lack the training or institutional support to implement such practices effectively. Another challenge is technological inequality. In many contexts, access to the digital tools required for multimodal pedagogy is uneven, raising questions of equity and inclusion. Furthermore, research on multimodality often remains fragmented across disciplines—appearing in journals of linguistics, education, media studies, and psychology—without sufficient interdisciplinary synthesis (Argyriou & Tapsis, 2023).

To address these challenges, future research should focus on developing practical models and toolkits that translate multimodal theory into everyday pedagogical practice. Collaborative projects involving educators, researchers, designers, and policymakers can foster the co-creation of context-sensitive resources tailored to diverse educational settings. Furthermore, longitudinal studies are needed to evaluate the long-term impact of multimodal pedagogy on learner outcomes, teacher development, and institutional change.

In conclusion, the shift from learning environments to pedagogical praxis marks a critical juncture in the trajectory of multimodality in education. No longer confined to discussions of interface design or technological innovation, multimodality is now deeply embedded in pedagogical theory and classroom practice. This evolution reflects a broader transformation in educational values—toward inclusion, creativity, emotional engagement, and learner empowerment. By embracing multimodal pedagogy as a dynamic and socially situated practice, educators and researchers can work together to build more just, responsive, and enriching learning environments for all.

5. Implications for Future Research

The evolving discourse on multimodality in education has generated rich theoretical and empirical insights into how learners construct meaning through multiple semiotic resources. However, this study highlights a critical gap in the breadth and depth of its application across educational fields. While multimodal theory has found significant traction within linguistics, applied language studies, and literacy research (Cope & Kalantzis, 2015; Jewitt, Bezemer, & O'Halloran, 2016), its integration into other areas such as inclusive education, curriculum theory, and educational technology remains limited. This asymmetry presents both a challenge and an opportunity for future research to advance a more interdisciplinary, inclusive, and critical engagement with multimodal frameworks.

One of the pressing needs identified through the bibliometric and thematic analysis of the literature is the expansion of multimodal research beyond the boundaries of textual and linguistic interpretation. As Adami (2016) argues, multimodality encompasses not only the interaction of language and image but the entire spectrum of meaning-making practices, including gesture, gaze, movement, sound, space, and materiality. This broader understanding is particularly relevant in fields such as inclusive education, where learners often rely on non-verbal or alternative communication systems. For example, students with speech impairments, neurodiverse learners, or those from linguistically diverse backgrounds may benefit from educational approaches that embrace a fuller repertoire of communicative modes (Melenets, Shcherbyna, & Kulbediuk, 2024). Yet, multimodality is seldom operationalised in inclusive pedagogical frameworks or teacher training programmes in a systematic way.

To address this gap, future research should critically examine how multimodal practices can support differentiated instruction and universal design for learning (CAST, 2018). There is potential to explore how teachers can design learning environments that are not only technologically rich but also socially and culturally responsive. Multimodality in this sense should not be reduced to the deployment of tools (e.g., videos, slides, animations), but understood as a pedagogical mindset that values diverse forms of knowing and expressing. Such an orientation necessitates research that is situated, practice-based, and participatory—moving away from experimental designs that isolate variables in controlled settings and toward studies that reflect the complexities of real-world classrooms (Lim, 2024).

Another promising direction for future research lies in the intersection of multimodality with curriculum studies. The way curriculum is designed, delivered, and assessed has profound implications for the kind of multimodal engagement learners experience. Currently, most national curricula remain strongly oriented toward verbal literacy and numeric reasoning, with little space for embodied, performative, or visual learning. Research can play a critical role in challenging these epistemological hierarchies by demonstrating the legitimacy and pedagogical value of multimodal texts,

performances, and interactions as valid forms of knowledge construction and representation (Kress, 2009; Grannås & Stavem, 2021).

Moreover, curriculum research could investigate how multimodal approaches can foster transversal skills such as collaboration, creativity, and critical thinking, which are increasingly emphasised in 21st-century education agendas. Projects exploring interdisciplinary curriculum design, in which students work across subject boundaries using multiple modes—e.g., creating a podcast in science class, a comic strip in history, or an animation in literature—can provide empirical grounding for a more holistic and integrated approach to curriculum reform.

In the domain of educational technology, multimodality offers both conceptual clarity and pedagogical depth. While technology-enhanced learning environments inherently support multimodal design, much of the research remains focused on usability, efficiency, and learning analytics, rather than on the deeper implications of how modes are orchestrated and interpreted by learners. Bernsen (2008) and Moreno & Mayer (2007) have laid important groundwork by exploring multimodal system design and the cognitive effects of multimedia instruction. Yet, these studies often treat learners as passive recipients of information, rather than active designers of meaning. A shift is needed toward investigating how students and teachers co-construct knowledge through multimodal interactions within digital platforms, games, and virtual environments (Kansal, Kaur, & Bhandari, 2024).

Additionally, future research should explore how multimodal learning environments shape learner identity and agency. Digital tools enable new forms of self-expression and collaboration, but they also introduce new challenges around digital literacies, ethical awareness, and power relations. Researchers must therefore interrogate the socio-political dimensions of multimodality, examining who gets to speak, whose modes are valued, and how technology may reproduce or disrupt existing inequalities (Gee, 1996; Snyder, 2001). This critical perspective is especially vital in global contexts marked by linguistic, cultural, and technological asymmetries.

Related to this, scholars are increasingly calling for the integration of adjacent concepts—multiplicity, cultural hybridity, and cognitive complexity—into the study of multimodality. These notions expand the analytical lens beyond the immediate configuration of modes to encompass the broader cultural and psychological dynamics of learning. Multiplicity refers to the coexistence of multiple meaning systems within the same communicative act, often across languages, disciplines, and identities. Cultural hybridity foregrounds how learners negotiate and remix global and local cultural forms, especially in transnational or diaspora contexts. Cognitive complexity points to the non-linear, iterative, and dynamic processes involved in multimodal learning, which may challenge traditional models of instructional design and assessment (Aksnes, Langfeldt, & Wouters, 2019; Cope & Kalantzis, 2015).

Incorporating these concepts into future research could deepen our understanding of how multimodality functions not only as a surface-level design principle but as a complex, culturally situated cognitive practice. For instance, studying how bilingual

students use translanguaging strategies in multimodal storytelling can offer insights into how linguistic and cultural repertoires are mobilised in the service of meaning-making (Lim, Towndrow, & Tan, 2023). Similarly, exploring how students from different cultural backgrounds interpret visual metaphors or interface design can inform the development of culturally inclusive educational materials.

Future research should also consider methodological innovation. Traditional content analysis and coding of modal elements can be complemented by ethnographic, narrative, and design-based research methodologies that capture the lived experience of multimodal learning. Multimodal discourse analysis (Jewitt, 2008) and video-based interaction analysis offer powerful tools for investigating how meaning emerges in real time across verbal and non-verbal channels. Participatory design methods can involve students and teachers as co-researchers, thereby generating findings that are not only analytically rich but also pedagogically actionable.

Importantly, the implications for research are not merely academic. They also concern policy and practice. Multimodality has the potential to inform inclusive pedagogical standards, teacher training frameworks, and digital content guidelines across educational systems. It can contribute to debates about what counts as knowledge, how assessment should be diversified, and how learning environments can be reimagined to support diverse learners. Yet, for these contributions to be realised, the field must move beyond isolated case studies and toward the development of shared frameworks, cumulative findings, and critical mass in publication and citation metrics (Argyriou & Tapsis, 2025).

In summary, this study underscores the urgent need for a more integrated, interdisciplinary, and critically reflexive research agenda on multimodality in education. Rather than remaining confined to literacy and language studies, multimodal frameworks should be mobilised to address broader educational challenges—equity, curriculum innovation, learner well-being, and global citizenship. By engaging with related constructs such as multiplicity, hybridity, and complexity, and by adopting inclusive and practice-oriented methodologies, future research can build a richer, more holistic understanding of how multimodality shapes and is shaped by educational practice in an increasingly diverse and interconnected world.

6. Conclusion

This study has highlighted the significance of multimodality as a foundational pedagogical and theoretical construct within 21st-century education. Far from being a mere enhancement of digital tools or a technical feature of educational environments, multimodality represents a profound reorientation in how teaching and learning are conceptualised, designed, and enacted. Grounded in social semiotic theory, multimodality challenges the traditional dominance of verbal and written language in educational settings by foregrounding the full spectrum of meaning-making practices—linguistic, visual, gestural, spatial, auditory, and digital. As such, it calls for a radical

rethinking of literacy, curriculum, assessment, and teacher practice, especially in the context of increasingly diverse, digitised, and inclusive learning environments.

Integrating multimodality into the broader paradigm of multiliteracies strengthens its critical and transformative potential. The pedagogical framework of multiliteracies—as developed by Cope and Kalantzis (2015)—underscores the need for situated, culturally responsive, and design-based approaches to learning. Within this context, multimodal design is not simply about using multiple media, but about enabling learners to express and construct knowledge using the full range of semiotic resources available to them. This reconceptualisation aligns with constructivist and participatory pedagogies, where students are seen as active designers of meaning rather than passive recipients of information.

One of the most important shifts documented in this study is the thematic transition from a focus on multimodal learning environments—often technologically oriented and interface-driven—towards a more situated and relational understanding of multimodal pedagogy. Recent literature increasingly conceptualises multimodality not as a tool, but as an educational stance that centres learner identity, well-being, collaboration, and expression. Research by Lim (2024), Grannås & Stavem (2021) and Melenets *et al.* (2024), among others, supports this view, demonstrating how multimodal practices can promote inclusive, creative, and emotionally resonant learning experiences. The implications of this shift are wide-ranging. Firstly, multimodality is shown to play a key role in supporting learner agency, particularly in culturally and linguistically diverse classrooms. By legitimising multiple ways of knowing and expressing, multimodal approaches can enhance the visibility and participation of students who may otherwise be marginalised by monolingual, text-based, or standardised curricula. This is particularly relevant for neurodiverse learners, students with disabilities, and those from minority language backgrounds. Inclusive pedagogy, when informed by multimodality, fosters differentiated instruction, flexible assessment, and student-centred learning environments.

Secondly, the study highlights the potential of multimodality to transform how knowledge is evaluated and legitimised within educational systems. Traditional assessment tools often fail to capture the complexity of student thinking and creativity when expressed through non-linear, visual, or performative means. Multimodal assessment frameworks—which value coherence, intentional design, and audience engagement—offer a more nuanced understanding of learner performance and progression. Implementing such approaches, however, requires extensive professional development for teachers, as well as a cultural shift in how academic achievement is understood and recognised.

Thirdly, the findings underscore the need for a broader theoretical and methodological scope in multimodality research. While existing studies provide valuable insights, they often remain isolated within specific disciplines or methodological silos. To move the field forward, scholars must engage in interdisciplinary collaborations that integrate insights from cognitive science, cultural studies, educational technology, special

education, and curriculum studies. Moreover, there is a growing consensus on the value of incorporating related constructs—such as multiplicity, cultural hybridity, and cognitive complexity—into multimodal research. These concepts invite researchers to consider how learners draw upon diverse semiotic and cultural repertoires to construct meaning in increasingly fluid and hybrid learning environments.

In terms of methodology, future research should combine bibliometric tools with qualitative approaches such as ethnography, multimodal discourse analysis, design-based research, and participatory inquiry. These methods can offer a more granular understanding of how multimodality operates in authentic learning settings, how students and teachers negotiate meaning across modes, and how power and identity are enacted through multimodal texts and practices. Participatory and co-design approaches, in particular, hold promise for involving educators and learners as co-creators of knowledge, thereby enhancing the relevance and applicability of research findings.

The study also draws attention to the institutional and structural conditions necessary for the full implementation of multimodal education. Schools and educational systems must move beyond viewing multimodality as a supplementary or innovative add-on, and instead embed it within curriculum standards, teacher training programmes, and assessment policies. Policymakers, teacher educators, and curriculum developers should collaborate in creating environments that support multimodal teaching and learning—not only by providing technological infrastructure but by fostering pedagogical cultures that value diversity, creativity, and critical engagement.

Lastly, the study recognises the challenges that persist in advancing a coherent and inclusive multimodality research agenda. Among these are the digital divide, disparities in teacher training, institutional resistance to change, and the epistemological conservatism of standardised curricula. Addressing these barriers requires sustained investment in capacity-building, collaborative research networks, and the development of open-access resources that facilitate the sharing of best practices across contexts.

In conclusion, this study positions multimodality not merely as a pedagogical trend but as a vital and transformative framework for 21st-century education. Its conceptual roots in social semiotics, its alignment with multiliteracies, and its capacity to foster inclusive, learner-centred, and critically engaged practices make it highly relevant to contemporary educational challenges. However, realising this potential necessitates greater interdisciplinary coherence, deeper empirical grounding, and sustained theoretical innovation. By reimagining multimodality as a core educational principle rather than an ancillary strategy, educators, researchers, and policymakers can work collectively to reshape learning experiences in more equitable, responsive, and imaginative ways.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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