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EDUCATIONAL COMICS AS A VISUAL MEDIUM: POTENTIALS AND IMPLICATIONS FOR PUPILS WITH LEARNING DISABILITIES

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Abstract:

Comics are increasingly recognised as a promising educational medium that integrates visuals and text to convey knowledge in an accessible, engaging and meaningful way. Unlike conventional text-heavy materials, comics provide a multimodal learning experience that draws on the strengths of both linguistic and visual representation. For pupils with learning disabilities (LD), including dyslexia, Attention Deficit Hyperactivity Disorder (ADHD) and autism spectrum conditions, such resources are especially valuable. Traditional instructional texts often create barriers to reading fluency, comprehension and motivation, whereas comics offer structured scaffolding through sequential panels, simplified dialogue and expressive imagery. These features can reduce cognitive load, sustain attention and foster active engagement with content. This concept paper explores the potential of educational comics as a visual medium by examining the global history and evolution of comics as a form of communication, their categorisation into narrative, informative and educational types, and their pedagogical relevance for pupils with LD. Several theoretical perspectives guide this exploration, including Dual Coding Theory, Cognitive Load Theory, Automaticity Theory and Self-Determination Theory. Based on these foundations, a conceptual framework is proposed to illustrate how comics can support learning processes and outcomes. The framework highlights the contributions of comics to reading fluency, comprehension, motivation and socio-emotional development. The discussion also considers potential challenges in adopting comics within special education, particularly issues of teacher preparedness, curricular alignment and the availability of

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appropriate resources. Nevertheless, the inclusive and motivating nature of comics positions them as valuable pedagogical tools for promoting accessible, equitable and engaging education for diverse pupils. This positions educational comics not merely as supplementary resources but also as transformative tools for inclusive education.

Keywords:

Educational Comics; Visual Learning; Reading Fluency; Inclusive Education; Motivation

Introduction

The use of visual media in education has gained growing attention in recent decades, particularly as teaching and learning environments become more diverse and learner-centred (Mayer, 2009). Visual tools offer multiple entry points for pupils to engage with knowledge, often reducing reliance on text-heavy formats that can be challenging for certain pupils. Among these visual tools, comics stand out as a unique medium that combines text, images and sequential narratives to create an engaging form of communication (Eisner, 1985; McCloud, 1993). Unlike traditional textbooks, comics provide visual scaffolding that helps pupils interpret meaning, retain information and remain motivated throughout the learning process (Pande et al., 2020).

For pupils with learning disabilities (LD), conventional instructional approaches that rely primarily on lengthy passages of text often create barriers to comprehension, fluency and participation (Snowling et al., 2020). Learning disabilities such as dyslexia, Attention Deficit Hyperactivity Disorder (ADHD) and autism spectrum conditions are commonly associated with difficulties in decoding written words, sustaining attention and interpreting abstract concepts (American Psychiatric Association, 2013). As a result, many pupils with LD struggle not only with literacy development but also with maintaining motivation and confidence in academic contexts (Humphrey & Mullins, 2002). There is therefore a pressing need for alternative pedagogical resources that are both accessible and inclusive, addressing cognitive, linguistic and socio-emotional needs (Bong & Chua, 2023).

Educational comics provide one such alternative. Defined by Eisner (1985) as a form of graphic communication that integrates text and imagery into sequential art, and by McCloud (1993) as a medium where visual and linguistic signs work together to convey meaning across panels, comics represent more than just entertainment. They embody a narrative structure that guides readers step by step, balancing visuals and text to facilitate comprehension. Their potential as learning tools has been demonstrated across disciplines, from science education to health literacy, showing consistent benefits in improving engagement, comprehension and recall (Kuttner et al., 2021).

The pedagogical value of comics can be explained through several theoretical perspectives. Dual Coding Theory (Paivio, 1986) emphasises that information is processed more effectively when delivered through both verbal and visual channels. Cognitive Load Theory (Sweller, 1994) suggests that comics, by breaking down information into manageable segments supported by visuals, reduce extraneous cognitive load. Automaticity Theory (LaBerge & Samuels, 1974) highlights how repeated exposure to meaningful text in comics can support reading fluency, while Self-Determination Theory (Deci & Ryan, 1985) explains how comics

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foster motivation through autonomy, relatedness and enjoyment. Together, these perspectives provide a strong foundation for considering comics as pedagogical innovations in special education.

In inclusive classrooms, the role of comics is not only to simplify text but also to humanise learning. Characters, dialogue and visual storytelling allow pupils to connect with learning materials emotionally and socially (Dallacqua, 2020). For pupils with LD, this connection can transform reading from a source of frustration into an enjoyable and achievable task. The multimodal nature of comics enables them to function as differentiated instructional tools, supporting diverse learning needs within the same classroom environment (Cohn, 2020).

The aim of this concept paper is to explore the potential of educational comics as a visual medium for pupils with LD. Specifically, the paper examines the historical development of comics, their categorisation in educational contexts and their relevance for supporting LD pupils. A conceptual framework is proposed to illustrate the mechanisms through which comics influence learning processes and outcomes, and implications are discussed for teachers, pupils and broader educational practice. By positioning comics as innovative and inclusive pedagogical resources, this paper contributes to ongoing conversations about the role of visual media in creating equitable learning opportunities for all pupils.

Literature Review

Comics as a Visual Medium in Education

Comics represent a visual medium that integrates text and illustrations into sequential panels to communicate narratives, ideas or information in ways that are engaging and easily understood. Eisner (1985) defined comics as a form of graphic communication that delivers narrative through the integration of words and images in a linear arrangement, while McCloud (1993) described comics as a sequence of images and symbols arranged to convey information or evoke aesthetic responses. These definitions highlight the power of comics to blend visual and linguistic elements into a narrative flow that enhances comprehension.

As narrative-based visual reading material, comics capture pupils' attention through their entertaining and user-friendly approach (Pande et al., 2020). In educational contexts, comics are increasingly recognised as effective teaching and learning tools (Nur Akcanca, 2020). Key features such as simplified dialogue, clear illustrations and structured panels allow knowledge to be presented systematically and comprehensibly (Siti Rahayu, 2023). Comics also help pupils connect abstract concepts with concrete visual representations, reducing cognitive load and improving focus and understanding.

Comics align with modern pedagogical approaches such as learner-centred learning and constructivism. Through these perspectives, pupils actively build meaning by interpreting illustrations, dialogue and sequential narratives (Krupskyi & Hudoshnyk, 2022). Printed comics offer accessibility and ease of use, particularly in classrooms where digital resources are limited (Chitra Devi et al., 2022). They also encourage direct interaction with learning materials, such as highlighting, folding pages or peer discussions (Eka Rama et al., 2021). At the same time, digital comics such as webtoons provide immersive experiences with animations, sound effects, hyperlinks and responsive displays that engage digital-native pupils

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(Shufi et al., 2022). Interactivity, such as choosing story paths or answering embedded quizzes, further supports active engagement and reflective learning.

History and Evolution of Comics

The origins of comics can be traced to ancient visual storytelling traditions such as Egyptian murals, medieval manuscript illustrations and the Bayeux Tapestry in France. Although these early examples did not fully resemble modern comics, they illustrated humanity's long-standing desire to convey stories and information through the integration of images and symbols. Such traditions demonstrated how visuals could be arranged sequentially to create meaning, a principle that later became central to the comic form. Modern comics began to take shape in the late nineteenth century, particularly in the United States, with the publication of The Yellow Kid in 1895. This comic is often cited as the first to introduce the now-standard speech balloon, an innovation that established a key visual convention still used globally. Following this milestone, the popularity of comic strips such as Little Nemo, Popeye and Superman accelerated the growth of comics into a powerful cultural and commercial industry, marking the beginning of their global influence.

As the medium expanded, comics adapted to diverse cultural contexts and developed unique artistic traditions across different regions. In Japan, manga rose to prominence after World War II, with Osamu Tezuka pioneering works that combined emotional depth with narrative sophistication. Manga rapidly diversified into multiple genres, including science fiction, history, education and psychology, and captured audiences ranging from children to adults. In Europe, the bande dessinée tradition thrived in France and Belgium, producing internationally recognised titles such as Hergé's Tintin and Asterix. These works became cultural icons, blending entertainment with social commentary, historical reflection and political satire. The popularity and recognition of these European and Japanese traditions established comics not only as forms of leisure reading but also as cultural artefacts and artistic expressions that transcended national boundaries.

The twenty-first century introduced a digital revolution that fundamentally reshaped how comics were produced, distributed and consumed. The rise of South Korean webtoons, designed specifically for vertical smartphone reading, marked a transformative shift in the comic industry. Distributed through platforms such as Webtoon, Tapas and Mangatoon, these digital comics reached a global audience, offering unprecedented accessibility and interactivity. Features such as scrolling formats, embedded sound effects and reader participation altered reading habits while allowing independent creators to publish their work to international audiences. This transition from print to digital signalled the adaptability of comics in responding to technological and cultural changes. From their ancient roots in visual storytelling to their modern incarnation in digital formats, the history of comics reflects the medium's enduring relevance and capacity to evolve in step with the communicative needs of society.

Categories of Comics

Comics as a narrative medium have evolved into multiple categories, each serving distinct purposes in entertainment, communication and education. Among the most common are narrative comics, which focus primarily on fictional or semi-fictional storytelling. These comics employ characters, plots, conflicts and resolutions to deliver engaging narratives across genres such as action, fantasy, science fiction, romance and adventure (Gardner, 2020). Unlike

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traditional prose, narrative comics combine visual storytelling with dialogue and narration, enabling readers to follow complex plots through sequential panels. This fusion of imagery and text not only sustains reader interest but also stimulates imagination, empathy and emotional understanding (Cohn, 2020). Well-known examples include Japanese manga such as Naruto and One Piece, American superhero comics like Superman and Spider-Man, and culturally rooted works such as Lat's Kampung Boy, which illustrate how narrative comics can reflect cultural identity while entertaining diverse audiences.

Another significant category is informative comics, which are designed to convey factual information in a simplified and visually supported manner. Unlike narrative comics, their primary goal is not entertainment but rather the communication of knowledge that might otherwise be difficult to grasp. Informative comics are often used in areas such as science, health and history, where visual representation helps explain abstract or technical concepts (Kearns & Kearns, 2020). Their straightforward structure and clarity make them particularly effective for young readers or audiences with limited literacy skills. At an international level, the Science Comics series published by First Second Books illustrates complex topics such as the solar system, volcanoes and ecosystems through engaging illustrations and concise explanations (Kuttner et al., 2021). Similarly, health-related comics are frequently employed in public campaigns to raise awareness of disease prevention or environmental issues, demonstrating how this category extends beyond classrooms into community education.

Educational comics, meanwhile, represent a purposeful synthesis of narrative and informative elements with explicit pedagogical objectives. Unlike purely narrative or informative comics, educational comics are systematically developed to align with learning outcomes and curricular standards (Farah Nadia et al., 2014; Karagoz, 2018). They are carefully designed with features such as simplified vocabulary, age-appropriate content, balanced text-to-image ratios and structured panel arrangements to enhance comprehension and retention (Eka Anastasia et al., 2021). Educational comics are now widely used to support learning across various disciplines, including language, science, history and social studies. Internationally, they have been shown to enhance motivation and understanding by presenting subject matter in a more relatable and enjoyable form. Their relevance has grown in inclusive education, where they provide accessible entry points for pupils with different learning profiles. By merging entertainment and pedagogy, educational comics demonstrate the transformative potential of the medium as both a literacy tool and a means of fostering deeper engagement with academic content.

Importance of Educational Comics for Pupils with Learning Disabilities (LD)

Educational comics are increasingly recognised as effective pedagogical tools for supporting pupils with LD, including dyslexia, ADHD, autism spectrum conditions and language delays. Unlike conventional text-based resources that often overwhelm these pupils with dense passages of information, comics employ sequential panels, simplified dialogue and expressive illustrations to scaffold learning in ways that are accessible and engaging. This visual-linguistic integration reduces cognitive load and provides pupils with structured pathways to process information. Pupils with ADHD, for example, benefit from shorter text segments and dynamic visual cues that sustain attention and minimise distraction (Balanescu, 2024; Cohn, 2020). Similarly, pupils with dyslexia often rely on illustrations to decode meaning, as visual support clarifies the narrative and reduces the reliance on phonological decoding alone (Peterle, 2021). By combining words and images in a mutually reinforcing manner, educational comics create

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inclusive entry points that enable pupils with diverse learning profiles to participate meaningfully in literacy-based activities.

In addition to facilitating attention and comprehension, educational comics contribute significantly to the development of reading fluency, prosody and expressive skills. Reading comics aloud encourages pupils to practise intonation, rhythm and emotion when interpreting character dialogues, thereby enhancing oral fluency and accuracy (Lopez, 2022). This is particularly beneficial for pupils with reading difficulties who may otherwise struggle with monotone or disfluent reading. For pupils on the autism spectrum, visual depictions of facial expressions and body language provide valuable socio-emotional cues that improve their ability to recognise and respond to emotions in real-life contexts (Shalev et al., 2022). Such exposure supports both linguistic and social development, positioning comics as tools that go beyond academic literacy to nurture interpersonal skills and emotional understanding. The multimodal design of comics thus aligns with multi-sensory learning approaches, offering LD pupils opportunities to integrate cognitive, linguistic and socio-emotional growth within a single medium.

Equally important is the motivational impact of educational comics. Pupils with LD often experience repeated failure in conventional reading tasks, leading to frustration, reduced self-confidence and disengagement from learning (Humphrey & Mullins, 2002). Comics, by contrast, offer an enjoyable and approachable reading experience. Their brevity, visual appeal, and narrative flow enable pupils to complete reading tasks more easily, creating a sense of accomplishment that reinforces positive attitudes towards learning (Dallacqua, 2020; Siti Rahayu, 2023). This motivational effect is closely aligned with Self-Determination Theory (Deci & Ryan, 1985), which posits that pupils are more likely to be intrinsically motivated when learning activities are enjoyable, relevant and supportive of autonomy. By transforming reading from a source of anxiety into a rewarding experience, educational comics help cultivate resilience, persistence and long-term engagement. For pupils with LD, these motivational gains are particularly critical, as they not only enhance literacy outcomes but also strengthen self-esteem and social inclusion within the classroom environment.

Conceptual Framework

The conceptual framework of this paper brings together key learning theories to explain how educational comics can support pupils with LD. It outlines the link between comics as a visual medium, the underlying theoretical foundations and the expected learning outcomes. Figure 1 shows the conceptual framework.

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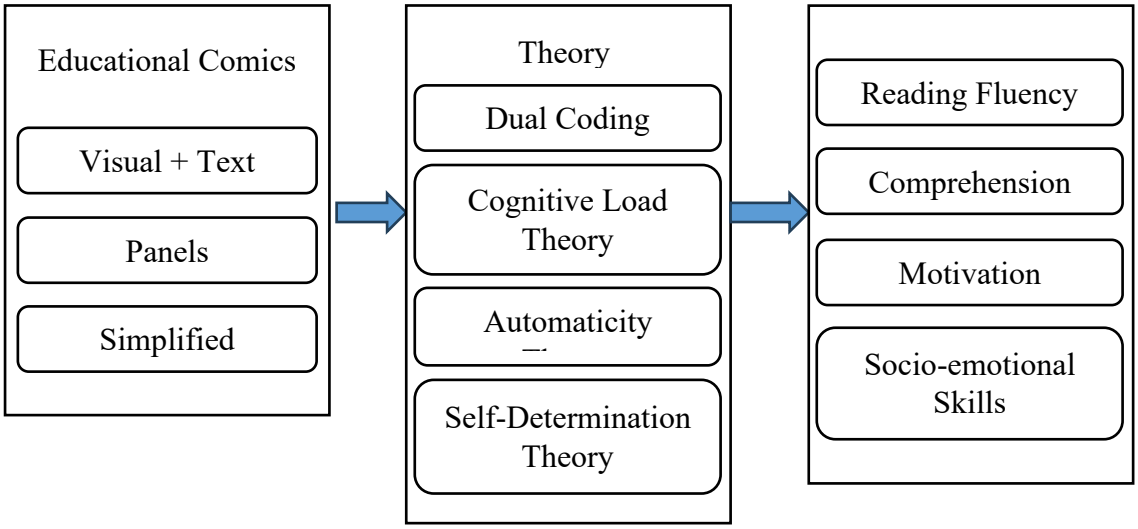

Figure 1: Conceptual Framework of Educational Comics for Pupils with Learning Disabilities

The conceptual framework for this paper draws upon four theoretical perspectives: Dual Coding Theory, Cognitive Load Theory, Automaticity Theory and Self-Determination Theory. These perspectives explain how educational comics function as a visual medium that supports learning among pupils with LD. Collectively, these theories illustrate the mechanisms through which comics influence cognitive processing, reading fluency, motivation and socio-emotional development, positioning them as powerful pedagogical tools that respond to the unique challenges faced by LD pupils. According to Dual Coding Theory (Paivio, 1986), learning is enhanced when information is processed through both verbal and visual channels. Educational comics embody this principle by integrating text and illustrations in sequential panels, which allows pupils to encode information through dual pathways and thereby strengthen comprehension, memory retention and transfer of knowledge. At the same time, Cognitive Load Theory (Sweller, 1994) provides an additional explanation by emphasising how comics reduce extraneous cognitive demands. By breaking information into manageable chunks and reinforcing meaning through imagery, comics help pupils, particularly those with dyslexia or ADHD, avoid overload when confronted with dense and text-heavy resources, enabling them to sustain focus and build understanding at a more comfortable pace.

Complementing these cognitive perspectives, Automaticity Theory (LaBerge & Samuels, 1974) highlights how repeated exposure to meaningful and engaging text, such as the dialogues and narratives embedded in comics, can accelerate word recognition and fluency. For LD pupils, the structured repetition provided by comics within a supportive visual-narrative context creates opportunities for smoother reading practice, where decoding becomes less effortful and cognitive resources can be redirected towards comprehension. Beyond cognitive and linguistic processes, motivation also plays a central role in learning. Self-Determination Theory (Deci & Ryan, 1985) explains how pupils are more likely to engage in sustained reading when activities provide enjoyment, autonomy and a sense of accomplishment. Educational comics respond directly to this need by transforming reading into a pleasurable and rewarding experience, reducing the frustration often associated with traditional texts and nurturing intrinsic motivation that can sustain long-term engagement with literacy tasks.

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Taken together, these theoretical perspectives converge into a framework in which educational comics provide layered benefits for pupils with LD by scaffolding cognition, reducing barriers to comprehension, promoting fluency through meaningful repetition and fostering motivation through engaging content. The expected outcomes of this process include measurable gains in reading fluency, deeper comprehension, enhanced intrinsic motivation and improved socio-emotional skills, all of which are essential not only for academic achievement but also for the personal growth and classroom inclusion of pupils with diverse learning needs. By integrating these theoretical insights into a single model, the framework underscores the multifaceted potential of comics as an inclusive educational medium that aligns cognitive, linguistic, motivational and socio-emotional dimensions of learning.

Discussion

Educational comics offer unique affordances that address many barriers faced by pupils with LD. By combining visuals and text in sequential panels, they provide scaffolding that supports decoding, comprehension and memory retention. This aligns with Dual Coding Theory, which emphasises that learning is more effective when verbal and visual information are processed together (Paivio, 1986). When information is presented in smaller, manageable chunks with visual cues, pupils are less likely to experience overload, supporting the principles of Cognitive Load Theory (Sweller, 1994). Such features are particularly beneficial for pupils with dyslexia or ADHD, who often struggle with dense text and limited working memory (Hulme & Snowling, 2016; Toste et al., 2025). In this sense, comics serve as an accessible entry point for pupils who would otherwise disengage from conventional reading tasks.

Beyond cognitive benefits, comics can foster motivation and sustained engagement. The use of narrative flow, expressive characters and humour provides enjoyment and accessibility, transforming reading into a less intimidating task (Rapp et al., 2015). Self-Determination Theory is relevant here, highlighting that pupils are more motivated when they experience autonomy, competence and relatedness (Deci & Ryan, 1985). Educational comics encourage autonomy by allowing choice of stories, competence through visible progress across panels, and relatedness via emotional connections with characters and plots (Chik et al., 2021). These motivational factors are essential for pupils with LD, who often face repeated setbacks with traditional reading materials (Humphrey & Mullins, 2002). When reading becomes enjoyable rather than frustrating, pupils are more likely to persist and achieve long-term success.

Nevertheless, challenges in implementation remain significant. Teachers may lack training in visual literacy and in evaluating comics for pedagogical use (Habeahan, 2025; Ranker, 2007). In addition, the quality of resources varies, leading to concerns about factual accuracy, cultural relevance and developmental appropriateness. Accessibility also requires careful attention: features such as font size, colour contrast and panel arrangement can either support or hinder pupils with dyslexia and ADHD (Noor Rizan & Kama Shaffeei, 2025; Taylor et al., 2019). While digital comics and webtoons offer advantages such as interactivity, zooming and read-aloud functions (Habiddin et al., 2022), they also raise equity issues related to device availability and classroom management (Bintoro et al., 2022; Marianthi et al., 2016). These realities suggest that the integration of comics into education must be guided by careful planning and critical evaluation.

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Despite these challenges, practical strategies can enhance the effectiveness of comics in supporting pupils with LD. Purposeful integration of concise text and meaningful illustrations aligns with dual coding, while progressive sequencing of panels supports cognitive load management (Bessette, 2020). Repetition through dialogue and narrative structure reinforces automaticity (LaBerge & Samuels, 1974), and the inclusion of culturally relevant themes or learner choice strengthens intrinsic motivation (Badeo et al., 2021; Gomez, 2014). These strategies suggest that comics are not merely alternative reading materials but can serve as structured multimodal pedagogical tools that lower barriers and support meaningful learning experiences (Dallacqua, 2020). Ultimately, the success of such approaches depends on how well teachers adapt these strategies to their specific pupils' needs.

Overall, evidence from both theoretical perspectives and empirical studies indicates that educational comics have strong potential in special education. They not only reduce cognitive barriers and improve reading fluency but also nurture motivation and socio-emotional development (Peterle, 2021). With thoughtful design, teacher preparation and alignment to pupils' needs, comics can complement traditional textbooks and digital platforms, ultimately contributing to a more inclusive and engaging educational environment (Shalev et al., 2022). As such, comics should be viewed not just as supplementary resources but as valuable pedagogical tools within inclusive education.

Implication

The insights from this concept paper highlight several important implications for educational practice. For teachers, comics can be positioned as a flexible instructional tool that lowers barriers to reading and supports differentiated instruction. When incorporated into lessons, comics can provide pupils with LD greater opportunities to engage with content in meaningful ways. This not only reduces frustration but also promotes enjoyment and motivation in learning. To achieve this, educators need to develop visual literacy skills and be able to select or design comics that are pedagogically aligned with curriculum goals. Ultimately, the implication is that teachers must be supported with the right training and resources to integrate comics effectively into inclusive classrooms.

From a theoretical perspective, this paper reinforces the value of applying multimodal learning theories such as Dual Coding Theory, Cognitive Load Theory, Automaticity Theory, and Self-Determination Theory in the design of educational resources. Comics demonstrate how these perspectives intersect to create learning environments that are cognitively supportive, emotionally engaging and motivationally sustainable. By showing how theory can be translated into practice, this framework also opens space for further research on how comics contribute to learning outcomes across different disability profiles. Such theoretical grounding strengthens the academic case for comics as a legitimate and powerful medium in special education.

At the policy level, the potential of comics to support inclusive education underscores the need for wider recognition of alternative instructional media. Policymakers and curriculum developers should consider encouraging the adoption of educational comics as part of school resources, teacher training and inclusive education initiatives. Investment in both print and digital formats can expand access and create more equitable opportunities for pupils with diverse learning needs. The implication here is that systemic support is crucial if comics are to

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move beyond isolated classroom practices and become part of a broader commitment to inclusive and engaging education.

Conclusion

This concept paper has demonstrated the potential of educational comics as powerful tools for supporting pupils with LD. By integrating text and visuals in sequential panels, comics provide cognitive scaffolding that reduces overload, enhances comprehension and sustains engagement. Drawing on Dual Coding Theory, Cognitive Load Theory, Automaticity Theory, and Self-Determination Theory, comics are shown to support reading fluency, comprehension, motivation and socio-emotional development. Despite these strengths, challenges remain. Limited teacher training, varying resource quality and issues of digital accessibility must be addressed to ensure meaningful integration of comics into inclusive education practices. Professional development, careful instructional design and systemic support are essential for maximising their benefits. In conclusion, educational comics should be recognised as more than supplementary materials. They represent a versatile pedagogy that empowers pupils with LD to participate actively in learning while building confidence, motivation and a positive reading identity. Ultimately, comics transform barriers into opportunities and hold promise for advancing inclusive and meaningful education. Future research should examine how comics can be adapted across subjects and cultures to extend their impact.

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