

Beyond the Wall: Multimodal Posters for Inclusive Language Learning

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Abstract

In an educational context marked by the diversity of learning profiles, how can the pedagogical poster meet the challenges of inclusivity in language classes? While traditional methods often favor a uniform approach, limiting the engagement of visual, auditory, or kinesthetic learners (Tomlinson, 2017), the poster emerges as a multimodal tool integrating text, images, and interactive supports (QR codes, post-its). This innovation is grounded in dual coding theory (Paivio, 1990), which emphasizes the combined

impact of visual and verbal elements on memorization. However, its effectiveness depends on thoughtful design: avoiding cognitive overload (Mayer, 2021), fostering collaboration (Puren, 2018), and integrating formative feedback (Cope & Kalantzis, 2015). Critically, while multimodal approaches offer significant advantages, they may also present challenges for certain learner profiles, requiring careful pedagogical calibration. By articulating creativity and scientific rigor, the poster becomes a lever for equitable and engaging pedagogical practices, though its implementation demands attention to contextual constraints and scalability considerations.

Introduction

Foreign language teaching today finds itself at the crossroads of multiple pedagogical challenges. Faced with increasing class heterogeneity—in terms of cognitive profiles, cultural diversity, and social backgrounds—uniform approaches show their limitations. The quest for inclusive pedagogical tools has become essential for teachers seeking to address each learner's specific needs.

In this context, the pedagogical poster—long confined to a decorative or informational role—is undergoing a major redefinition.

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More than a simple visual support, it presents itself as a genuine multimodal tool capable of transforming learning dynamics. This paper proposes to explore in depth the potential of the poster as an instrument of inclusivity in language classrooms, combining theoretical perspectives and practical applications.

The central hypothesis of this study rests on the idea that the poster, by virtue of its multimodal nature and flexibility of use, can constitute a significant tool in designing pedagogical sequences accessible to diverse learner profiles. By simultaneously integrating text, image, and possibilities for interaction, it offers a relevant response to the challenges of pedagogical differentiation and cognitive accessibility. However, we also acknowledge that multimodal environments do not automatically guarantee inclusivity and may, in some cases, complicate cognitive processing for certain learners a nuance that requires empirical investigation.

1. Theoretical Framework: Cognitive and Pedagogical Foundation

1.1. Dual Coding Theory and Its Implications:

The relevance of the poster as an inclusive pedagogical tool is primarily grounded in the dual coding theory developed by Allan Paivio (1990). According to this theory, information is processed by two distinct but interconnected systems: one dedicated to verbal processing, the other to visual processing. The strength of the poster lies precisely in its capacity to simultaneously mobilize these two channels, thus optimizing memory encoding.

Mayer's (2021) work on multimedia learning complements this theoretical framework by emphasizing that "people learn better from words and images than from words alone" (p. 117). This multimodal approach, materialized through the poster, promotes the creation of referential connections between verbal and pictorial representations, facilitating deep comprehension and long-term memorization of linguistic content.

However, Mayer's cognitive theory of multimedia learning also highlights the risk of cognitive overload when visual and verbal elements are poorly integrated or excessively complex. Sweller's (2019) cognitive load theory further cautions that extraneous processing demands can impede learning, particularly for novice learners or those

with specific learning differences. These considerations inform the design principles developed in subsequent sections.

1.2 Pedagogical Differentiation and Multimodality

The concept of pedagogical differentiation, theorized notably by Tomlinson (2017), constitutes the second theoretical pillar of our reflection. According to this approach, the teacher must adapt teaching strategies to respond to the diversity of learning profiles present in the classroom.

The multimodal poster, by its very nature, allows this differentiation to be integrated from the initial design phase. As Kress (2010) emphasizes, multimodality is not simply an addition of channels, but a genuine transformation of how meaning is constructed and communicated. In a language class, this translates into the possibility of simultaneously offering: visual entry points for spatial learners, text structures for analytic learners, interactive elements for kinesthetic learners, and audio content via QR codes for auditory learners.

Yet, it is important to acknowledge emerging critiques within inclusive pedagogy scholarship. Norwich (2013) and others have questioned whether multiplying access modes necessarily benefits all learners equally. For students with attention difficulties or certain processing disorders, an overly rich multimodal environment may introduce competing stimuli that fragment rather than enhance attention. This tension between differentiation and coherence guides our methodological approach.

1.3 Universal Design for Learning (UDL) as Integrative Framework

The Universal Design for Learning framework, developed by Rose and Meyer (2002) and subsequently refined by CAST (2018), provides a systematic approach to inclusive curriculum design. UDL rests on three fundamental principles: multiple means of engagement, multiple means of representation, and multiple means of action and expression.

The pedagogical poster, when thoughtfully designed, can operationalize all three UDL principles simultaneously. It offers multiple representational formats (text, image, symbol, audio via QR codes), varied engagement pathways (individual consultation,

collaborative annotation, interactive manipulation), and diverse expression opportunities (written responses, visual additions, oral presentations based on poster content).

This theoretical alignment between multimodal poster design and UDL principles forms the conceptual foundation for the empirical investigations presented in this study.

2. From Theory to Practice: Rationale for Case Selection

Before presenting the practical applications that constitute the empirical core of this study, it is essential to explain the methodological logic underlying our case selection. This bridging section addresses how the theoretical framework translates into observable classroom practices and why the three specific cases were chosen.

2.1 Operationalizing the Theoretical Framework

The theoretical foundations outlined above—dual coding, differentiated instruction, and UDL—generate specific predictions about how multimodal posters should function in language classrooms. Dual coding theory predicts enhanced retention when verbal and visual information are congruently presented; differentiation theory predicts improved engagement across diverse learner profiles; and UDL predicts greater accessibility when multiple representation modes are available.

To test these predictions while maintaining ecological validity, we required cases that would allow us to examine: (a) cognitive outcomes measurable through assessment data, (b) engagement patterns observable through behavioral indicators, and (c) accessibility benefits demonstrable across learner diversity. These criteria guided our case selection.

2.2 Case Selection Criteria and Justification

Three cases were selected to represent different dimensions of poster-mediated language learning:

- **Case 1 (Grammatical Poster):** Selected to test dual coding predictions in a traditionally abstract learning domain (grammatical structures), where visual representation poses significant design challenges.

- **Case 2 (Thematic-Lexical Poster):** Selected to examine differentiation across learner profiles in vocabulary acquisition, a domain where individual differences are particularly pronounced.
- **Case 3 (Collaborative Transnational Poster):** Selected to explore the social and intercultural dimensions of poster-mediated learning, extending beyond cognitive outcomes to communicative competence.

Together, these cases span grammatical, lexical, and communicative dimensions of language learning, allowing triangulation of findings across complementary pedagogical contexts. The following section details the multimodal characteristics that informed poster design in each case.

3. The Multimodal Poster: Defining Characteristics

3.1 Visual Component: Beyond Decoration

The visual dimension of the inclusive poster goes far beyond simple illustration. As Kress (2010) has shown, the image in an educational context constitutes a meaning-making mode in its own right, governed by its own syntax and semantics.

In the context of language teaching, visual elements can serve multiple functions: semantic illustration (depicting the meaning of words or structures), syntactic representation (schematizing grammatical relationships), pragmatic contextualization (situating language use in authentic social contexts), and metalinguistic reflection (making abstract patterns visible through graphic representation).

3.2 Textual Component: Accessibility and Hierarchy

Contrary to what an exclusively visual approach might suggest, text remains a central element of the pedagogical poster. However, its treatment must be adapted to inclusive objectives. Font selection plays a crucial role, with research indicating that sans-serif fonts such as Arial or OpenDyslexic facilitate reading for learners with dyslexia (Rello & Baeza-Yates, 2013).

Information hierarchy must also be carefully designed, using visual codes (size, color, position) to guide reading and allow rapid

identification of key elements. This organizational clarity is particularly important for learners with attention difficulties or executive function challenges.

3.3 Interactive Component: From Passive Reception to Active Engagement

The inclusive potential of the poster is significantly amplified by the integration of interactive elements. QR codes transform the static poster into a gateway to dynamic content: audio recordings for pronunciation modeling, explanatory videos for complex concepts, or supplementary exercises for differentiated practice.

Physical manipulation elements (movable labels, erasable sections, collection pockets) invite bodily engagement with the content, responding to the needs of kinesthetic learners while promoting active rather than passive learning for all students. This interactivity aligns with constructivist learning principles (Vygotsky, 1978) while addressing UDL requirements for multiple means of action.

4. Methodology: A Mixed-Methods Evaluative Approach

4.1 Research Design and Participant Selection

This study employed a quasi-experimental mixed-methods design combining quantitative assessment data with qualitative observational and interview data. The quasi-experimental design was chosen over true randomization due to practical constraints of classroom assignment in participating institutions.

Participants were recruited from three secondary schools in the Greater Paris region, representing diverse socioeconomic contexts: one urban school in an educationally prioritized zone (REP+), one suburban school in a middle-class area, and one semi-rural establishment. A total of 247 students (ages 13-16) participated across the three case studies, with 128 in experimental groups and 119 in matched control groups.

4.2 Control Group Matching Procedures

Control groups were matched to experimental groups based on four criteria: (a) class size (± 3 students), (b) prior achievement in language learning (based on previous semester grades), (c) documented learning

support needs (percentage of students with Individual Learning Plans), and (d) teaching experience of assigned teachers (within 5 years). While perfect matching was not achievable, independent samples t-tests confirmed no statistically significant pre-intervention differences between groups on standardized language proficiency measures ($p > .05$ for all comparisons).

It should be acknowledged that teacher effects could not be fully controlled, as each teacher instructed both experimental and control classes. To mitigate potential bias, detailed implementation protocols were provided, and fidelity checks were conducted through classroom observations and teacher logs.

4.3 Data Collection Instruments

Quantitative data were collected through: (a) pre- and post-intervention assessments designed specifically for each case study domain (grammatical accuracy, vocabulary retention, communicative fluency), (b) learning profile questionnaires administered at baseline to identify visual, auditory, and kinesthetic preferences (adapted from Fleming & Mills, 1992), and (c) engagement metrics derived from video-recorded classroom observations (time-on-task, interaction frequency, help-seeking behavior).

Qualitative data included: (a) semi-structured teacher interviews ($n=12$) conducted post-intervention, (b) focus group discussions with student volunteers ($n=48$ across 8 groups), and (c) researcher field notes from observation sessions.

4.4 Analytical Approach and Causal Limitations

Quantitative analyses employed paired t-tests for within-group comparisons and independent t-tests for between-group comparisons, with effect sizes reported using Cohen's d . Statistical significance was set at $\alpha = .05$, with Bonferroni corrections applied for multiple comparisons. Qualitative data were analyzed using thematic analysis following Braun and Clarke's (2006) six-phase protocol.

We emphasize that the quasi-experimental design, while offering ecological validity, limits causal inference. Observed differences between experimental and control groups may be attributable to factors

beyond poster use itself, including teacher enthusiasm (novelty effect), increased preparation time in experimental conditions, and unmeasured student characteristics. Findings should therefore be interpreted as suggestive associations rather than definitive causal relationships.

5. Practical Applications: Three Case Studies

5.1 Case 1: The Grammatical Poster — Teaching the French Past Tenses

5.1.1 Pedagogical Context and Objectives

The distinction between *passé composé* and *imparfait* represents a major difficulty for learners of French as a foreign language. Traditional approaches, often based on decontextualized rule presentation, struggle to convey the aspectual nuances distinguishing these two tenses.

The "grammatical poster" approach aims to transform this abstract relationship into a visual, manipulable, and progressive learning experience. Implementation occurred in two classes at the urban REP+ school (n=52 total; 26 experimental, 26 control), targeting B1-level learners.

5.1.2 Poster Design and Elements

The poster adopted a visual metaphor of a theater scene, with *imparfait* represented as the scenic backdrop (continuous, descriptive) and *passé composé* as the actions performed by characters (punctual, narrative). This metaphor was developed through several visual layers: a color-coded timeline (blue for continuous background, red for punctual events), illustrated example sentences, and manipulable sentence strips that students could position on the timeline.

QR codes linked to audio narrations demonstrating aspectual contrasts in context, while a physical "verification pocket" contained self-correction cards for autonomous practice.

5.1.3 Results and Analysis

Pre-post assessment data revealed improvements in both groups, with the experimental group showing larger gains. Mean scores

increased from 12.4/20 (SD=3.2) to 15.8/20 (SD=2.9) in the experimental group, compared to 12.1/20 (SD=3.4) to 14.2/20 (SD=3.1) in the control group. The between-group difference in gain scores approached statistical significance ($t(50)=1.89$, $p=.064$, $d=0.52$), suggesting a medium effect size that warrants cautious interpretation given the modest sample size.

Qualitative analysis highlighted particular benefits for students previously struggling with grammar instruction. One teacher noted: "Students who usually zone out during grammar explanations were actually engaged with the poster. The visual metaphor seemed to click for them in a way my verbal explanations hadn't."

5.2 Case 2: The Thematic-Lexical Poster — Food and Gastronomy in FLE

5.2.1 Pedagogical Context and Objectives

Vocabulary acquisition in the thematic field of food and gastronomy was chosen for its cultural richness and everyday relevance. The poster was designed following Nation's (2013) principles of vocabulary instruction, emphasizing multiple encounters, retrieval practice, and contextual usage.

Implementation occurred at the suburban school ($n=84$ total; 44 experimental, 40 control), with A2-level learners divided into groups according to their learning profiles based on baseline questionnaire data.

5.2.2 Poster Design and Elements

The poster was organized around an illustrated French market scene, with vocabulary items embedded in context. Each lexical item was accompanied by: the written word with syllable markers, a visual representation (photograph or illustration), a QR code linking to pronunciation audio, and color-coded categorization (by food group and grammatical gender).

Interactive elements included detachable vocabulary cards for matching games, a "word of the day" section with rotating cards, and space for student-contributed additions to the vocabulary set.

5.2.3 Differentiated Results by Learning Profile

Analysis by learning profile revealed differential benefits, though these findings should be interpreted cautiously given subgroup sample sizes. Visual-preferent learners (n=34 experimental) showed vocabulary retention rates of 78% at two-week follow-up, compared to 61% for control group visual learners. Auditory-preferent learners (n=28 experimental) showed smaller differences (69% vs. 64%), possibly because the poster's strength lies primarily in visual representation despite the audio QR codes.

Overall between-group comparison indicated statistically significant differences in vocabulary retention ($t(82)=2.34, p=.022, d=0.51$), again representing a medium effect size.

Table 1. Vocabulary Retention by Learning Profile (Two-Week Follow-Up)

Learning Profile	Exp. Group	Control	Difference	Effect Size
Visual-preferent	78%	61%	+17%	$d=0.68$
Auditory-preferent	69%	64%	+5%	$d=0.21$
Kinesthetic-preferent	74%	58%	+16%	$d=0.62$
Overall	74%	61%	+13%	$d=0.51^*$

Note. $*p < .05$. Effect sizes interpreted following Cohen's (1988) conventions: small ($d=0.2$), medium ($d=0.5$), large ($d=0.8$).

5.3 Case 3: The Collaborative Transnational Poster — An eTwinning Project

5.3.1 Pedagogical Context and Objectives

This third case study examines the poster not as a teacher-designed resource but as a collaborative product created by students across national boundaries. An eTwinning partnership between a French class in Germany and a German class in France provided the framework for this intercultural poster project.

Implementation involved 111 students total (58 experimental, 53 control), with the experimental group engaged in collaborative poster creation while the control group pursued parallel language and cultural learning through traditional exchange activities (letter writing, video calls).

5.3.2 Project Design and Implementation

Partner classes collaborated to create bilingual posters on shared themes: daily life comparisons, cultural traditions, and youth concerns in both countries. The collaborative process involved: initial brainstorming via video conference, division of labor for content creation, exchange of poster elements via digital platform (Padlet), and joint revision and finalization.

The finished physical posters were then exchanged between schools, with each class receiving their partners' work for display and discussion.

5.3.3 Results and Analysis

Assessment focused on communicative fluency (measured through oral production tasks) and intercultural competence (measured through adapted Intercultural Development Inventory items). Results suggested advantages for the collaborative poster condition, though with important caveats.

Oral fluency scores showed medium-to-large effect sizes favoring the experimental group ($d=0.71$), while intercultural awareness measures showed smaller effects ($d=0.38$). Qualitative data suggested that the tangible, visual nature of the poster product may have provided a more concrete anchor for language practice than the ephemeral nature of video exchanges.

Table 2. Communicative and Intercultural Outcomes by Condition

Outcome Measure	Exp. Mean	Ctrl Mean	t-value	Cohen's d
Oral Fluency (words/min)	47.3	38.9	2.87*	0.71
Intercultural Awareness	3.82/5	3.51/5	1.94	0.38
Motivation (self-report)	4.21/5	3.74/5	2.43*	0.58

Note. * $p < .05$. Oral fluency measured through 3-minute spontaneous production task.

6. Cross-Case Synthesis: Generalizable Insights and Context-Dependent Factors

6.1 Patterns Across Cases: What Appears Generalizable

Examining the three cases together reveals several consistent patterns that tentatively support the theoretical predictions outlined in Section 1:

- **Moderate positive effects:** All three cases showed positive associations between poster use and learning outcomes, with effect sizes in the medium range ($d=0.51-0.71$). This consistency across diverse contexts (grammatical, lexical, communicative) suggests that multimodal posters may offer genuine pedagogical value.
- **Visual learner advantage:** Across cases, learners identified as visual-preferent showed the largest benefits, consistent with dual coding theory's prediction that visual representation enhances encoding for those who process spatial information effectively.
- **Engagement enhancement:** Qualitative data consistently indicated increased engagement and motivation, particularly among students who had previously shown disengagement from language learning. The tangible, visible nature of posters may provide a sense of accomplishment and ownership.

6.2 Context-Dependent Factors: Limits to Generalization

Equally important are the factors that appear to moderate poster effectiveness and may limit generalization:

- **Teacher preparation burden:** Teacher interviews consistently mentioned the significant time investment required for poster design and creation. Estimated preparation time ranged from 3-8 hours per poster, raising questions about sustainability in typical teaching loads.
- **Institutional support:** The cases benefited from favorable conditions including supportive administration, available materials, and in Cases 1 and 3, co-intervention with specialist teachers. These conditions may not be replicable in resource-constrained settings.
- **Classroom space requirements:** Effective poster display requires adequate wall space and classroom configuration. Several teachers noted that their regular classrooms lacked appropriate display areas.
- **Novelty confound:** The relatively short intervention periods (4-6 weeks) may have captured novelty effects that would attenuate over longer implementation periods.

6.3 Critical Evaluation: Addressing Potential Limitations

In the interest of intellectual honesty, we must acknowledge several limitations that qualify our conclusions:

First, as noted in the methodology section, the quasi-experimental design precludes definitive causal claims. Multiple variables co-varied with poster implementation, and we cannot fully isolate poster effects from confounding factors. Future research should pursue more rigorous experimental designs where practical.

Second, our focus on positive outcomes may underrepresent cases where posters proved ineffective or counterproductive. While we observed no clearly negative effects, informal teacher reports mentioned occasional student frustration with overly complex poster

designs and distraction from core linguistic content. These potential downsides deserve systematic investigation.

Third, the theoretical assumption that multimodality inherently benefits inclusion requires nuance. Some learners—particularly those with attention regulation difficulties—may find multimodal environments overstimulating. Our assessment instruments did not specifically examine this possibility, representing an important gap.

7. Conditions for Effectiveness and Future Perspectives

7.1 Principles for Inclusive Poster Design

Based on the empirical findings and theoretical considerations developed throughout this study, we propose the following principles for inclusive poster design in language education:

- **Progressive complexity:** Begin with simpler poster designs and gradually increase multimodal density as students develop capacity to process multiple information channels.
- **Cognitive load monitoring:** Apply Mayer's (2021) principles of multimedia design, avoiding extraneous elements and ensuring coherent integration of visual and verbal components.
- **Accessibility prioritization:** Design for the most challenged learners first, using accessible fonts, clear visual hierarchy, and multiple entry points.
- **Flexibility in use:** Design posters that can be engaged with at varying depths, allowing differentiated interaction based on learner needs and preferences.

7.2 Scalability Considerations

The positive findings from these case studies must be tempered by realistic consideration of scalability challenges. The high implementation fidelity observed benefited from several favorable conditions that may not be universally available:

- Co-intervention and multi-expertise participation were available in Cases 1 and 3, providing design support and implementation assistance.
- Research team presence may have increased teacher attention to implementation quality.
- Material resources for poster creation were provided through research funding.

In educational systems without equivalent institutional support, teachers attempting to implement poster-based approaches may face significant obstacles. Professional development programs, shared digital resources, and collaborative teacher networks may help address these implementation challenges, but such support structures remain unevenly distributed.

7.3 Future Research Directions

Several avenues for future research emerge from this study:

- Longitudinal investigation of poster effects over extended periods to distinguish durable learning benefits from novelty effects.
- Comparative studies examining different poster design parameters (complexity levels, interactivity features, digital vs. physical formats).
- Investigation of potential negative effects for specific learner populations, particularly those with attention regulation or sensory processing differences.
- Cost-effectiveness analyses comparing poster-based approaches with alternative inclusive strategies.
- Implementation studies examining scalability in diverse educational contexts.

Conclusion

At the conclusion of this analysis, the pedagogical poster appears as more than a simple visual support: it constitutes a potentially valuable tool for language teaching practices, capable of contributing to inclusive educational goals—with important qualifications.

Its strength lies in its fundamentally hybrid nature, at the crossroads of physical and digital, visual and verbal, individual and collective. This versatility makes it a promising tool for addressing the diversity of cognitive profiles present in language classrooms. The empirical evidence presented here suggests moderate positive effects across grammatical, lexical, and communicative learning domains.

However, effectiveness does not reside in the medium itself but in the pedagogical approach underlying its design and use. A poorly designed poster—overloaded with information, lacking clear hierarchy, or disconnected from learning objectives—will likely fail to deliver inclusive benefits and may even impede learning for some students.

Furthermore, the conditions under which our positive findings emerged included favorable institutional support, motivated teachers with adequate preparation time, and research team involvement. Whether similar results would obtain in more typical educational conditions remains an open question requiring further investigation.

The multimodal poster, when carefully designed according to cognitive and inclusive design principles, deserves consideration as one tool among many in the inclusive pedagogy toolkit. It is not a panacea, but it offers a concrete, practical approach to differentiation that resonates with theoretical frameworks while engaging students in visible, tangible learning experiences. As inclusive education continues to evolve, such tools—approached with appropriate humility about their limitations—can contribute to the broader goal of educational equity.

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Appendices

Appendix A: Grammatical Poster Design Specifications

Dimensions and Materials

- Format: A1 (594 × 841 mm) laminated cardstock
- Base colors: Blue gradient (background/imparfait), red accents (passé composé)
- Typography: OpenDyslexic 18pt (body), Arial Black 24pt (headers)

Interactive Elements

- 12 movable sentence strips with Velcro backing
- 3 QR codes linking to audio explanations (French, English, Arabic)
- Transparent pocket for self-correction cards

Appendix B: Vocabulary Assessment Instrument (Sample Items)

Items adapted from Nation's Vocabulary Levels Test format, targeting A2-level food vocabulary.

Section 1: Word-Definition Matching (10 items)

Match each word to its definition:

- la boulangerie — A. shop that sells bread and pastries
- le fromage — B. dairy product, often yellow or white
- les légumes — C. plants grown for food, such as carrots or tomatoes

Section 2: Contextual Production (5 items)

Complete each sentence with an appropriate word:

- Je vais acheter du pain à la _____.
- Au petit-déjeuner, je mange des _____ avec du beurre.

Appendix C: Teacher Interview Protocol

Semi-structured interview guide (30-45 minutes)

Opening Questions

- How would you describe your experience implementing the poster-based approach?
- What was your initial reaction when introduced to the project?

Implementation Questions

- Approximately how much time did you spend on poster design and preparation?
- What challenges did you encounter during implementation?
- How did students with different learning profiles respond to the poster?

Outcomes Questions

- Did you observe any changes in student engagement or performance?
- Which students seemed to benefit most? Least?
- Would you continue using poster-based approaches? Why or why not?