

Media Converged Dictionary in Foreign Language Teaching: Evolution, Multimodal Database Construction and Contextualized & Explicit Instruction

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Abstract

The core purpose of dictionary compilation is to serve learners' needs. The emergence of media converged dictionary offers a new path for innovation in foreign language teaching. This article systematically examines the four-stage development of dictionary-assisted language teaching, deeply analyzing the structural characteristics, teaching functions, and user management mechanisms of multimodal dictionary databases. It focuses on the practical model of multi-modal literacy instruction based on dictionary databases and reveals the threshold effect and optimization strategies in multimodal instruction. Research shows that media converged dictionary, through multimodal integration, transcend the limitations of traditional dictionaries. Their databases can be deeply integrated into the entire teaching process (before, during, and after class). Multimodal literacy instruction, based on contextualized practice and explicit guidance, can effectively enhance learners' language proficiency and cultural literacy. At the same time, multimodal instruction must adhere to the principle of "less but better," balancing information input and cognitive load, and maximizing teaching efficiency through personalized adaptation. The study provides a theoretical framework and design plan for the use of media converged dictionary to assist foreign language teaching. Its teaching effectiveness needs to be further verified through subsequent classroom control experiments (such as comparing vocabulary test scores and cognitive load scale data of learners who use/do not use the database).

Key words: Media converged dictionary; Foreign language teaching; Multimodal database; Multi-dimensional reading; Threshold effect

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1. INTRODUCTION

Dictionaries have always been an important auxiliary tool in the development of language teaching. Traditional paper dictionaries, limited by their monomodal presentation format, cannot meet learners' needs for intuitive and personalized language knowledge. With the deep integration of media converged technology and educational informatization, converged media dictionaries have emerged. These dictionaries, with their core feature of multimodal integration, integrate multiple information carriers such as text, images, audio, and video, transforming abstract language knowledge into intuitive and vivid learning resources. They not only stimulate learners' interest but also provide personalized services based on their learning progress and needs, expanding new possibilities for dictionary-assisted foreign language teaching.

The concept of dictionary-assisted language teaching is not new; its development has undergone a long evolution. From the early focus on the user perspective of dictionary compilation, to differentiated design centered on user needs, to the active involvement of dictionaries in the teaching process, each stage of change has been closely linked to the evolution of teaching concepts, technological developments, and changes in learners' needs. Currently, the rise of multimodal literacy teaching concepts has

become a hot research topic in foreign language teaching, how to exploit the convergent media dictionary databases to build multimodal interactive teaching models that organically integrate language knowledge transfer with comprehensive literacy development?

The database uses multimodal information as its content carrier and integrated media technology as its functional support to achieve resource integration and interaction across teaching links.

Based on the development of dictionary-assisted language teaching, this article focuses on the teaching application of this database and explores the practical path of integrated media dictionaries under the framework of diversified reading teaching, in order to provide theoretical reference and practical guidance for foreign language teaching innovation and dictionary compilation.

Media converged dictionary is a new type of dictionary, powered by media converged technology, integrating multimodal information such as text, images, audio, and video. They enable cross-platform data interoperability, real-time interaction, and personalized adaptation (e.g., desktop, mobile, and teaching terminals). Their core features include three aspects:

First, deep multimodal information integration. They leverage technology to achieve complementary linkage between different modal resources (e.g., automatically matching a text word with a corresponding scene video when clicking on it) rather than simply overlaying text with audio and video;

Second, cross-platform integration, allowing users to simultaneously access dictionary data across various terminals, including teaching software, mobile apps, and web pages, ensuring consistent resources for pre-class preparation, classroom instruction, and post-class review;

And third, dynamic interaction and personalization, automatically delivering relevant resources based on learners' usage history (e.g., frequently searched words and common error types prioritizing grammar animations for those with weak grammar skills); and support for users to upload study notes and highlight key content, transforming the dictionary from a "dictionary tool" into a "personalized learning assistant."

It's important to note that 'media converged' and 'multimodality' are not synonymous. 'Multimodality' focuses on the formal dimension of information presentation (e.g., text, images, audio, and other modalities) and is the core information carrier of a media converged dictionary. On the one hand, 'media converged' emphasizes the technical and functional dimensions, focusing on integrating multimodal information through technology to enable cross-scenario applications and interactivity. In short, multimodality is the 'content form,' while media converged is the 'technical and functional support.' In terms of dictionary form, a 'multimodal dictionary' may only offer the multimodal information

presentation capabilities of 'text + audio and video,' but may not achieve cross-platform synchronization or personalized interaction. On the other hand, media converged dictionary build on multimodal information and further possess technical and functional attributes such as cross-platform integration, real-time interaction, and personalized adaptation, representing an advanced form of multimodal dictionaries. The 'media converged dictionary database' studied in this article is based on this logic, encompassing both multimodal information resources and cross-functional applications in teaching scenarios (before class, during class, etc.). The core difference between it and traditional 'multimodal dictionary databases' lies in its technical integration and adaptability to teaching functions.

This study focuses on the theoretical framework and design blueprint for media converged dictionary. It is a design-oriented study and does not yet include empirical data (such as classroom experiments or learner performance tests). The proposed multimodal database structure, instructional integration approach, and threshold effect optimization strategies require further empirical validation. For example, a controlled experiment comparing an experimental group (using a media converged dictionary) with a control group (using a traditional dictionary) could measure differences in vocabulary recall accuracy, grammatical application accuracy, and depth of cultural understanding. Furthermore, the Cognitive Load Scale (CLS) could be used to quantify the cognitive load of different multimodal combinations to verify the specific range of threshold effects (e.g., "three or fewer complementary modalities are sufficient to maintain effective cognitive load").

2. THE DEVELOPMENT AND EVOLUTION OF DICTIONARY-ASSISTED LANGUAGE INSTRUCTION

Dictionary-assisted language instruction refers to a teaching approach that uses dictionaries as a core teaching tool in the language teaching process, fully leveraging their coverage of vocabulary, including pronunciation, spelling, parts of speech, semantics, grammar, collocations, examples, and cultural background, to assist teachers in teaching activities and guide students' independent learning. Its core goal is to promote learners' accumulation of foreign language knowledge, enhance their language skills, and cultivate their cultural awareness, highlighting the functional value of dictionaries in teaching. Its development can be divided into four key stages.

2.1 User-Perspective Stage (1920s-1930s)

The core characteristic of the user-perspective stage was that lexicographers first became aware of the existence of

“users” and began to design dictionary content based on their learning needs. This marked a shift in lexicography from an editor-centered approach to one characterized by the emergence of user awareness. The theoretical foundation of this stage stems from the learning theory of American psychologist Edwin Thorndike. Based on animal learning experiments, he proposed three laws: the law of effect, the law of practice, and the law of readiness. He emphasized that learning is a gradual process of trial and error, providing theoretical support for the progressive vocabulary design of dictionaries.

Based on his own learning theory, Thorndike compiled the *Teacher’s Word Book* series (1921-1944), which for the first time incorporated the three key concepts of “gradual introduction of vocabulary,” “repeated practice and reinforcement,” and “progressive revelation of meaning.” Thorndike provided layered explanations based on vocabulary difficulty, helped learners consolidate their memory through frequent repetition, and used examples to help learners understand vocabulary usage in context and gain a sense of accomplishment. Building on this foundation, he further developed a series of student dictionaries, including the Thorndike-Century Dictionary and the Thorndike-Century Elementary Dictionary, establishing the first dictionary system for learners. During the same period, British scholar Michael West, through his reading experience, extracted 1,490 basic words, later expanding this to 1,551 as definitions. In 1955, he collaborated with Janet Endicott to publish *The New Method English Dictionary*, the first British dictionary designed specifically for overseas English learners. Significant innovations in student dictionaries during this period included the introduction of the concept of “controlled definitions” to ensure concise and accessible definitions; the incorporation of a frequency-based vocabulary to prioritize high-frequency, practical vocabulary; and the inclusion of lexical, grammatical, and usage information, with carefully selected examples to reinforce practical comprehension.

However, user research during this period still had significant limitations: it focused on superficial aspects, such as user dictionary ownership and frequency of use, failing to delve into the relationship between learners’ learning styles, language proficiency, and actual needs. Furthermore, it failed to optimize definitions and supporting examples based on the diverse needs of different user groups, limiting the dictionaries’ impact on teaching effectiveness.

2.2 User-Centered Stage (1960s-1990s)

After the 1960s, dictionary-assisted language teaching entered a user-centered phase. This phase marked the formal introduction of the concept of the “dictionary user,” marking a fundamental shift in lexicographical concepts from an “editor’s perspective” to a “user-centered” approach. Research during this phase focused on deeply

exploring users’ dictionary usage habits, information needs, and cognitive characteristics, providing empirical evidence for dictionary design. Research methods also expanded from single surveys to diverse approaches such as questionnaires, interviews, and observations.

In his study “Problems in Monolingual Business Dictionary Compilation,” Barnhart (1962) first emphasized the importance of studying users’ dictionary-consulting habits. Through a questionnaire survey of over 100 teachers in the Americas, he found that students’ core need for dictionary use was to look up word meanings and spellings. This finding directly prompted lexicographers to optimize the accuracy of word meaning explanations and the prominence of spelling cues. Quirk (1973) noted that dictionaries play an irreplaceable role in language teaching, and that teachers should focus on cultivating students’ dictionary usage habits and using dictionaries as core tools for independent learning. Subsequent scholars further refined user needs research: Tomaszczyk (1979) and others found that learners are most interested in the contextualized semantic information of new words during reading, with a low demand for other redundant information. For example, when reading literary works, learners prefer to understand the meaning of new words in specific contexts rather than a complete list of meanings. Harvey and Yuill (1997), through research on writing scenarios, pointed out that users primarily search for spelling, semantics, syntactic structure, collocation, and examples when writing, while paying little attention to the syntactic codes carefully designed by lexicographers (such as Vadv/prep and N-SING). This suggests that dictionary information presentation should emphasize practicality and avoid overly complex code designs.

Regarding dictionary type selection, studies by Baxter (1980) and Hartmann (1983), among others, found that second language learners prefer bilingual dictionaries for translation and reading, with a low rate of use of monolingual dictionaries. This phenomenon has prompted compilers to focus on optimizing the design of bilingual dictionaries and enhancing their adaptability to second language learning. As a key proponent of the user-centered approach, Hartmann repeatedly emphasized in the 1970s and 1980s: “All dictionaries are inspired by users” vocabulary needs. User-centeredness should be the core criterion for evaluating dictionaries. Any dictionary design that ignores users’ needs in different contexts is unrealistic” (Hartmann, 1983:5,10).

Representative dictionaries of this period include the *Longman Dictionary of Contemporary English*, published in 1978, and the *Collins COBUILD English Dictionary*, published in 1987. The former employed simple, easy-to-understand controlled vocabulary for its definitions, while the latter innovatively used natural sentences and selected examples close to everyday life. Both received positive market response for their precise alignment

with user needs, becoming classic examples of the user-centered approach. By the 1980s and 1990s, the “user-centered paradigm” had fully taken shape in the Western lexicographic community, laying the foundation for the subsequent development of dictionary-assisted instruction.

2.3 User Needs Stage (Late 1990s-Early 2000s)

The user needs stage represents a deepening and concretization of the user-centered approach. Its core characteristic is a shift from “generalized user needs” to “differentiated needs research.” It emphasizes that dictionary design, compilation, and content selection must closely address the specific needs of different user groups, with particular attention paid to the diverse needs of second language learners across different language activities (reading, writing, translation) and learning stages (beginner, intermediate, and advanced). This provides empirical support for personalized and targeted dictionary design.

Atkins (1998) systematically studied the dictionary usage behavior of different user types (from students to professors) through a collection of papers. He found that users choose different types of dictionaries (native monolingual dictionaries and bilingual dictionaries) depending on the type of task (translation, comprehension, and self-expression). His research offers two key recommendations: first, users’ dictionary-based skills need to be improved, with teachers providing systematic guidance to help students efficiently process dictionary information; second, dictionary compilation needs to optimize content based on user needs, providing accurate and accessible explanations and definitions that conform to cognitive principles. From a cognitive psychology perspective, Hulstijn and Atkins (1998) proposed determining dictionary type needs by analyzing users’ cognitive processes during dictionary use. Their study investigated users’ needs for dictionary functionality, content, and usability through a combination of questionnaires and interviews, highlighting key factors influencing dictionary usage. This approach provided guidance for the personalized design of electronic dictionaries and promoted the shift toward more user-friendly dictionary search.

Rundell (1999) focused on productive dictionary use, examining learners’ overreliance on learning strategies such as approximation, generalization, and circumlocution which can hinder vocabulary acquisition. While monolingual learning dictionaries are superior to bilingual dictionaries in assisting language output, they must meet the following design requirements: providing detailed semantic analysis, identification of easily confused words, transparent syntactic information, guiding phrases, frequency data, synonym/antonym lists, and error prompts. Furthermore, they emphasized the need for teachers to cultivate learners’ dictionary skills and guide dictionary selection based on teaching objectives. Dictionary editors

should also optimize content design based on learners’ backgrounds. Scholfield (1999) conducted research on receptive dictionary use (looking up the meaning of new words while reading) and proposed a five-step model of dictionary use: identifying the problem, deciding to use, finding the entry, locating the content, and applying the information. Their research found that learners are prone to misunderstandings when dealing with seemingly transparent vocabulary or idioms due to overreliance on strategies, such as skipping and guessing. Therefore, dictionaries need to optimize entry guidance to reduce the difficulty of finding words. McCreary and Dolezal (1999), using a vocabulary and reading test for ESL students, confirmed that using a monolingual English dictionary to assist reading can provide contextual clues and significantly improve test scores. However, simply looking up words without context had no significant effect. This conclusion highlights the importance of combining “dictionary + context” in receptive language activities.

Nesi’s (2002) survey of dictionary use habits among international students at British universities showed that while most students could find the correct meaning of a word while reading, more than half failed to look it up at least once, primarily due to selecting the wrong entry or misunderstanding the information. It proposes that teachers should guide students in understanding the differences in definitions across dictionaries, select information based on task requirements, and balance accuracy and fluency in language expression. Dictionary compilation should prioritize practical content, provide clear syntactic information, and be cross-culturally adaptable. Moreover, as noted by Lew (2002), dictionary usage research must avoid the limitations of a single method. To address long-term behaviors (such as the age of first dictionary purchase) and attitudes (dictionary preferences) that are difficult to capture with direct observation methods, it is necessary to supplement research with carefully designed questionnaires. A comprehensive understanding of user needs can only be achieved through a combination of multiple methods.

In recent years, domestic scholars have also carried out extensive research in this area focusing on differences in dictionary needs among learners at different learning stages (beginner, intermediate, and advanced), paths to deeply integrate dictionaries into the language learning process, and the impact of learners’ language proficiency, learning tasks, cultural background, and learning style on dictionary needs. These multi-dimensional studies provide theoretical support for the localized design and teaching application of dictionaries, promoting the development of dictionary-assisted instruction towards “precision.”

2.4 Dictionary Intervention Stage (Early 21st Century to Present)

The dictionary intervention stage represents an extension

and breakthrough of user needs research. Its core characteristic is the transformation of dictionaries from “passive query tools” to “active teaching participants.” It emphasizes integrating dictionaries into the entire foreign language teaching process through systematic design. Teachers guide students to use dictionaries as learning strategies, optimize compilation design and usage guidance through evaluation of dictionary teaching effectiveness, and explore feasible ways for dictionaries to fulfill their teaching functions.

The key difference between the dictionary intervention stage and the user needs stage lies in: the former focuses on “how to design dictionaries based on user needs,” relying on passive querying for dictionary functionality; the latter focuses on “how dictionaries can actively participate in teaching,” assisting teaching through user interpretation and application of dictionary information, and realizing the value of dictionaries through active intervention. Dictionary intervention is mainly divided into indirect and direct intervention. Current research and practice focus on indirect intervention, namely, the planned and purposeful use of dictionaries in lesson preparation and learning, indirectly supporting teaching activities.

Lin (2000) explored the role of dictionaries in cultural introduction in foreign language teaching, proposing that dictionaries can help learners correctly understand culturally meaningful vocabulary, idioms, and allusions by providing cultural background knowledge and pragmatic information. It points out that language symbolic information includes conceptual meaning, additional meaning, grammatical meaning, collocational meaning, and cultural meaning. The core goal of foreign language teaching is to cultivate communicative competence, and cross-cultural communication requires the introduction of cultural information as a foundation. Dictionaries are an important vehicle for this introduction. Regarding culturally restricted words and phrases in the source and target languages, the “cultural interpretations” of dictionaries can effectively help learners understand cultural differences and avoid communication errors.

Zhang (2002) emphasized that foreign language teaching dictionaries must contain all the necessary information for learners. Understanding the structure of dictionary information and correctly interpreting the content are crucial for cultivating foreign language communicative competence. From the perspectives of “dictionaries and grammatical competence cultivation” and “dictionaries and discourse competence cultivation,” it systematically expounds on the teaching function of learning dictionaries in vocabulary annotation, interpretation, and illustration. It proposes that teachers should connect classroom knowledge with dictionary knowledge, guiding students to apply the morphological, syntactic, semantic, and pragmatic information in

dictionaries in conjunction with learning tasks. Students should also develop the habit of consulting dictionaries outside of class to improve their language coherence and discourse competence through dictionaries. Ma and Kong (2015), through a one-year dictionary-assisted vocabulary learning experiment with junior high school students, found that electronic dictionaries play a positive role in English vocabulary learning. Combining electronic dictionaries with vocabulary learning strategy training can achieve three major benefits: first, significantly increase students’ vocabulary, making vocabulary learning strategies an effective tool; second, cultivate students’ habit of using learning strategies independently; and third, improve students’ attitudes towards vocabulary learning, reducing their fear and rejection of learning.

Zhang and Liu (2019) explored the implications of learning dictionaries for vocabulary instruction and proposed drawing on the vocabulary knowledge presentation methods of learning dictionaries to construct a vocabulary semantic network through semantic clustering to help learners establish knowledge associations. Their recommendations include: Vocabulary instruction should be graded based on frequency, emphasizing the polysemy and collocation of high-frequency and basic vocabulary; strengthening semantic rationale analysis, improving vocabulary memorization in stages, and building semantic networks through meaning extension and vocabulary association to improve vocabulary acquisition efficiency. Wei (2010) pointed out that traditional dictionaries, due to design limitations, lack functionality in classroom teaching and lack guidance for students’ after-class use, resulting in low efficiency. Modern English learning dictionaries, however, offer advantages in supporting systematic vocabulary cognition and are valuable in classroom teaching. Teachers should fully utilize learning dictionary resources to guide classroom teaching and independent learning after class, and test the effectiveness of independent learning through classroom exercises. Zhou (2014) and Yang (2018) focused on the application of dictionaries in metaphor teaching, proposing that metaphorical information in dictionaries (metaphorical meanings of words, metaphorical collocations, and metaphorical sentences) can help learners understand metaphorical mechanisms. For example, by understanding related sentences through the metaphor column “up/down” and understanding etymological and cultural differences with the help of idiom dictionaries, they can overcome the current dilemma of metaphor-based teaching in English. With the development of information technology, dictionary intervention has expanded from indirect to direct. Dictionary databases have begun to be deeply integrated with online courses, classroom interactions, and after-class exercises, becoming a core component of teaching resources and propelling dictionary-assisted teaching into a new stage of development.

In summary, the four-stage evolution of dictionary-assisted foreign language teaching is essentially an upgrade of dictionary functions from passive query to active teaching intervention: from the user-focused vocabulary grading in the 1920s to the user-focused content optimization from the 1960s to the 1990s, to the emphasis on direct dictionary intervention in teaching in the early 21st century, each step echoes the upgraded demand for personalized, contextualized, and multi-dimensional foreign language teaching (Hartmann, 1983; Nesi, 2000). However, traditional dictionaries (even electronic ones) are limited by unimodal presentation or single-platform functionality, making them unable to meet current teaching needs for multimodal resource integration, cross-scenario interaction, and cognitive load balancing. This is precisely the core motivation for this study's proposal of a "media converged dictionary database": by covering the full dimensions of "vocabulary-grammar-culture" through multimodal resources, and leveraging media converged technology to achieve cross-terminal synchronization and personalized adaptation. Thus, it will ultimately fill the gap in "technology-enabled teaching" during the "dictionary intervention" stage and provide a more systematic solution for dictionary-assisted foreign language teaching (see Section III on database construction for details).

3. CONSTRUCTION AND TEACHING FUNCTION OF THE MEDIA CONVERGED DICTIONARY DATABASE

With the development of media converged technology and educational informatization, the construction of media converged dictionary database has become a core approach for the integration of dictionaries into foreign language teaching. These databases integrate multimodal information, such as text, images, audio, and video, transforming dictionaries from simple query tools into fully functional teaching resources. They can be deeply integrated into the entire process of "pre-class preparation - classroom teaching - post-class review," transforming the teacher's role from "knowledge transmitter" to "learning instructor." Traditional classroom teaching can be shifted to extracurricular activities, allowing more classroom time to be used for discussion, practice, and problem-solving, significantly improving teaching efficiency.

3.1 Structural Features of Media Converged Dictionary Database

Media converged dictionary database are designed with the core goal of "efficiently processing, storing, and accessing multimodal information." Their structural design encompasses four dimensions: data structure, multimodal information processing, storage strategy, and

user interface, ensuring comprehensiveness, easy retrieval, and user-friendliness.

3.1.1 Data Structure Design

The database adopts a two-layer structure of "lexical knowledge system + multimodal fields." Core fields include:

Basic language information: vocabulary pronunciation (phonetic symbols + audio), spelling, part of speech, and inflection (e.g., plural nouns, past tense verbs);

Semantic and syntactic information: literal meaning, metaphorical meaning, semantic structure, syntactic patterns (e.g., transitive/intransitive verbs, double object constructions), and collocation rules (fixed collocations, common collocations);

Examples and contextual information: realistic examples, text fragments, and descriptions of real-life usage scenarios;

Multimodal auxiliary information: high-definition images, dynamic videos, simulated audio, and cultural scene animations;

Lexical relationship information: synonyms, antonyms, cognates, and semantic field-related vocabulary (e.g., vocabulary within the semantic field "animal").

At the lexical level, the database not only records surface-level information but also delves into deeper knowledge, such as semantic construction structures and exceptions to usage rules, providing comprehensive knowledge support for French teaching. For example, for the French verb "dispenser", the database not only records its core meanings, such as "evacuate, disperse; spread, spread out", but also details the usage differences corresponding to different subjects (people/matter/natural phenomena) - when the subject is "people", common collocations are "dispenser la foule" (evacuate the crowd) and "dispenser les manifestants" (disperse demonstrators), emphasizing the proactive action; when the subject is "matter or natural phenomenon", the collocations are "dispenser la fumée" (disperse the smoke) and "le vent disperse les nuages" (the wind blows away the clouds). The former can reflect human actions, while the latter highlights the role of natural phenomena.

3.1.2 Multimodal Information Processing

The core of multimodal information processing is to associate diverse supplementary materials with each French vocabulary word or knowledge point, activating users' multisensory experiences and strengthening their understanding and retention of French vocabulary (especially culturally relevant vocabulary). Specific practices include:

Visual modality: Matching abstract words with concrete images (e.g., "éléphant" is matched with images of elephants from different angles and scenes, helping to distinguish the appearance differences between "un éléphant d'Afrique" (African elephant) and "un éléphant

d'Asie" (Asian elephant) ; matching culturally specific words with images of cultural scenes (e.g., "pâques" (Easter) is matched with images of French families eating "gâteau de pâques" (Easter Cakes) and hunting for Easter eggs, and "la Fête nationale française" (French National Day) is matched with images of the military parade on the Champs-Élysées in Paris).

Auditory modality: Provides audio of standard French pronunciation (including differences between French pronunciation in Canada and Quebec French, for example, "oui" is often pronounced as [wi] in Canada, but may be pronounced as [wi:] in Quebec); audio of linked/weak pronunciation of words in sentences (for example, in "Je t'aime," "Je" and "t'" are linked as [ʒə tɛm], and "aime" is weakly pronounced as [ɛm]); and relevant background sounds (for example, "la plage" (the beach) matches the sounds of waves crashing and French-speaking people chatting on the beach, and "le marché français" (French market) matches the calls of French street vendors selling cheese and bread).

Dynamic modality: Match action vocabulary with demonstration videos (e.g., "danser" matches the footwork video of the traditional French folk dance "bourrée" and "cuisiner" matches the cooking step video of the French dish "coq au vin"); match grammatical rules with animation explanations (e.g., the selection rules for the auxiliary verbs "avoir" and "être" in the French past tense "passé composé", using animation to demonstrate the difference between "Je suis allé(e)" and "J'ai mangé", and annotating the core rule of "using être for motion verbs").

Cultural modality: Pair cultural interpretation videos with French-inspired vocabulary. For example, the video might first introduce the contrast between the literal and actual meanings of "donner sa langue au chat." While the literal meaning is "give your tongue to the cat," it actually means "give up (due to being unable to guess the answer or solve a problem)." This approach sparks learners' interest in French idioms. The video then explores the idiom's cultural origins. One theory suggests it stems from the French folk game of "guessing riddles." When frustrated and unable to guess the answer for a long time, participants would use the exaggerated expression "I'd rather give my tongue to the cat than continue guessing" to signal their resignation. This vivid metaphor gradually became prevalent in everyday communication. Another theory related to the habits of cats. In French culture, cats are often portrayed as cunning and unpredictable. "Giving your tongue to the cat" implies a sense of compromise, with even one's right to express oneself being taken away by a difficult opponent. The video then explains in detail its usage in everyday French: it's often used for casual interactions between friends (such as riddles and bets), small family competitions (such as guessing the gift or the movie title), or when encountering small everyday problems (such as losing your keys or being stuck on

a math problem). Its tone is relaxed and non-negative, distinguishing it from "abandonner" (which simply means "give up" and lacks the fun). The video also compares it to similar French expressions (such as "avouer sa défaite," which is more formal and lacks the liveliness of an idiom), highlighting the cultural uniqueness of "donner sa langue au chat." Finally, the video can reinforce understanding through situational demonstrations. For example, two French friends play a word guessing game, and one of them fails to guess "le roi des animaux" (the king of the jungle), the answer is "le lion") for several consecutive times, and finally says with a smile, "Je donne ma langue au chat! Dis-moi la réponse!" (I give up! Tell me the answer!); combined with pictures of real-life scenes (such as a child who can't put a puzzle together and says to his parents, "Je donne ma langue au chat, aide-moi!"), learners can intuitively grasp the usage context and tone of the idiom, and deeply understand the French folk language and cultural interests behind it.

Through the collaboration of multimodal information, abstract knowledge in French is transformed into perceptible concrete content.

3.1.3 Storage Strategy Optimization

The database adopts a "logically structured + technically optimized" storage strategy to ensure information orderliness and retrieval efficiency:

Logical Structure: Data is organized into a three-level structure: "Lexical Classification - Knowledge Module - Multimodal Resources." For example, the "Animal Vocabulary" category includes the "Morphology - Habits - Cultural Metaphor" knowledge modules, each of which is associated with corresponding image and video resources.

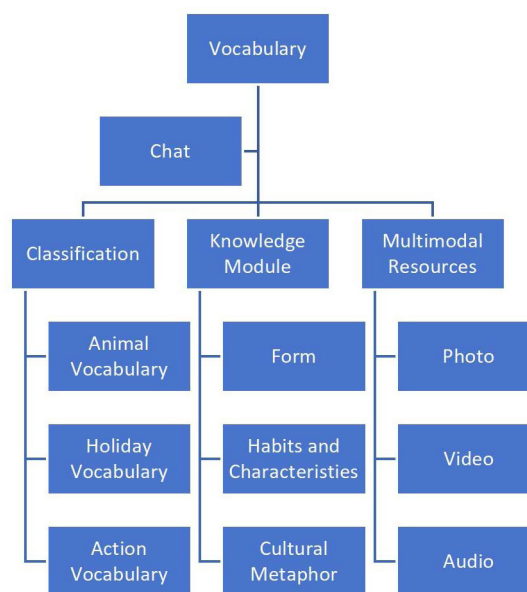


Figure 1
Three-level storage structure of the media converged dictionary database

Technical Optimization: ETL (Extract, Transform, Load) technology is used to extract, transform, and load data, ensuring data accuracy and integrity. Compression algorithms are used to reduce storage space usage, and a hierarchical storage strategy is implemented, storing frequently used multimodal information (such as audio of high-frequency words) on high-speed devices to improve access speed.

Backup and Update: Data is backed up regularly, and content is updated based on language development (such as the addition of the new word “selfie”) and teaching needs to ensure database timeliness.

3.1.4 User Interface Design

The user interface design is based on the principles of “convenient operation and personalized adaptation” to improve teaching and learning efficiency:

Navigation and Search: A clearly categorized navigation bar (vocabulary, grammar, culture, and exercises) is provided. Smart search (keyword prediction), voice search (voice input query), and image search (photo recognition) are supported, allowing users to quickly locate content by entering partial information.

Information Display: The search results page highlights core information (text definitions, audio buttons), and multimodal resources can be expanded on demand (e.g., clicking the “Video” button to play related content). Zoom, pause, and replay are supported.

Personalized technical features: Provide theme switching (light/dark mode), font size adjustment, and modal resource display (such as text-only mode) to adapt to different users’ visual preferences and device scenarios.

Learning assistance tools: Integrated note-taking, vocabulary collection, and learning progress tracking provide data support for subsequent personalized teaching strategies (see Section 5.2.1 for specific strategies).

3.2 Teaching Integration Paths for Media Converged Dictionary Database

Multimodal dictionary databases can be deeply integrated into every aspect of French teaching. Teaching activities can be designed around textbook knowledge nodes and learning tasks, achieving a closed loop of “knowledge transfer - practical training - effect evaluation.”

3.2.1 Integrated application of vocabulary teaching

In French vocabulary instruction, the database improves learning outcomes through a “multimodal activation + contextualized application” model:

During classroom instruction, when teachers explain French vocabulary in the text, they can simply click on the word to quickly access diverse resources in the database. For example, when explaining the noun “le marché aux puces” (flea market), the user can first call up the standard pronunciation audio (including the subtle intonation differences between the French and the Quebec French) to help students master accurate pronunciation; then

demonstrate its common collocations, such as “parcourir le marché aux puces” (go to the flea market), “acheter un vieux livre au marché aux puces” (buy a used book at the flea market), and “vendre des objets personnels au marché aux puces” (sell personal belongings at the flea market), clearly presenting the usage scenarios of the vocabulary; then pop up typical sentences, such as “Tous les samedis matin, ma grand-mère aime aller chercher des antiquités au marché aux puces de Montmartre” “Every Saturday morning, my grandmother loved to go to the Montmartre flea market to look for antiques,” helping students understand the grammatical placement and semantic logic of vocabulary within complete sentences.

More importantly, teachers can simultaneously play a live video of the Montmartre flea market in Paris: the video shows stalls stacked with vintage jewelry, old records, and handmade paintings, stall owners greeting customers warmly in French (“Bonjour! Vous cherchez quelque chose de spécial ?»), tourists bending over to select items and bargaining with stall owners (“Ce plateau en céramique, ça coûte combien ? Peut-on baisser le prix?”), accompanied by background sounds of the market (French conversations, bicycle bells, and street performers playing accordions). Through multimodal resources (images, audio, video), such as “pronunciation + collocation + example sentences + real-life video”, the “marché aux puces” scene is presented, and then cross-terminal synchronous playback is achieved with the help of media converged technology, students can not only grasp the literal meaning of “le marché aux puces”, but also intuitively perceive its position in French urban culture - it is not only a place to buy and sell second-hand items, but also a social space for French people to communicate about life and experience retro culture, thereby achieving a dual understanding of the “linguistic meaning” and “cultural meaning” of the word, avoiding the problem of only memorizing the Chinese interpretation but being unable to use it in actual contexts.

3.2.2 Integrated application of grammar teaching

The database uses a “rule analysis + multimodal illustration” model to transform abstract and complex French grammatical knowledge into intuitive and comprehensible content, helping students overcome learning difficulties:

a. Rule Visualization: Animation Deconstructs Grammatical Logic

Targeting the core difficulty of “adjective gender and number matching” in French, the database uses animations to clearly present detailed rules. For example, when explaining “feminine adjectives add ‘e’ and plural adjectives add ‘s’,” the animation first demonstrates the basic noun-adjective combination. For example, using “une fille” (a girl, feminine singular) and “beau” (beautiful, masculine infinitive) as an example, the ending of “beau” flashes to indicate “needs feminine,”

then automatically adds “e” to form “belle,” creating the correct combination “une fille belle.” The animation then demonstrates pluralization: when “des filles” (feminine plural) appears, the ending of “belle” flashes and adds “s,” forming “belles,” ultimately rendering “des filles belles.” The animation also highlights exceptions: when an adjective ends in “e” (such as the feminine form of “joli,” “jolie”), the plural form only requires an “s” (“des filles jolies”). Invariable adjectives (such as “orange” and “marron”) are highlighted with a red border, and the ending remains unchanged throughout the animation. Comparative examples like “un chat orange,” “des chats orange,” “une pomme marron,” and “des pommes marron” help students intuitively distinguish between “variations” and “exceptions,” avoiding errors caused by rote memorization.

b. Example Enrichment: Multiple Scenario Coverage and Dynamic Assistance

In the French lesson “Choosing the Auxiliary Verb avoir/être in the Passé Composé,” the database provides layered examples and dynamic analysis for each grammatical point:

Basic Scenario Examples: First, core collocations are presented by category—scenarios using avoir (e.g., «J’ai mangé un croissant ce matin» and «Elle a lu un roman hier») and scenarios using être (e.g., «Je suis allé(e) au parc» and «Ils sont partis en vacances»). The core rule for using être with verbs of motion and change of state (e.g., aller/partir/arriver/naitre/mourir) is also noted.

Dynamic Timeline Video: Each example sentence is paired with a timeline animation.

Taking “Je suis allé(e) au parc” as an example, the timeline shows “je suis ici” (I’m here now) and “je suis allé(e) au parc” (I went to the park in the past). The animated process of a person icon moving from the “current point” to the “park point” demonstrates the semantic logic of “être + past participle” emphasizing the “start and end point of the action.” In contrast, the timeline of “J’ai mangé un croissant” only shows “action completed” in the “past” position, without any movement track, providing a visual comparison of the differences in the usage of avoir/être. Supplementary sentences for special scenarios: Additional examples of “pronominal verbs (verbe pronominal) must use être» (such as “Je me suis levé(e) à 8h” and “Nous nous sommes arrêtés devant le café”) are provided, accompanied by action demonstration videos (scenes of people getting up and stopping), to reinforce the grammatical logic that “pronominal verbs are closely related to the subject and need to be assisted by être.»

3.2.3 Integrated Application of Cultural Education

The multimodal dictionary database, centered on “cultural context restoration + deep interpretation of connotations,” transforms abstract French cultural knowledge into tangible and interactive teaching content, helping learners

transcend the limitations of “surface language learning” and understand the cultural logic behind the language. For example:

For French vocabulary with culturally specific meanings (such as traditional festivals, folk customs, and unique cuisine), the database uses “text analysis + multimodal resource integration” to fully present the connotations and contexts of cultural symbols. For example, when explaining “la Chandeleur” (Candlemas Day), the core cultural information is first annotated through text: “A traditional French festival, held on February 2nd, the core custom is eating crepes. There is a folk saying that ‘holding a gold coin to fry crepes will bring good fortune in the coming year’”; then multimodal resources are called up - visually presenting a scene of a French family making crepes (the family sits around the dining table, and the children try to flip the crepes), and close-ups of crepe ingredients (flour, eggs, milk); auditorily matching the audio of a French family’s holiday conversation (“Attention à ne pas brûler la crêpe!” “Si tu réussis à la retourner d’un coup, tu gagnes un euro!”) and the sizzling sound of frying crepes; and dynamically playing a “step-by-step video of crepe making”, accompanied by French commentary explaining the traditional method of “from mixing the batter to flipping the crust” and the folk custom of “holding a gold coin with the left hand and flipping the crepe with the right hand.” Through multimodal interaction, learners can not only grasp the literal meaning of “la Chandeleur”, but also intuitively perceive its position in French culture - it is both a continuation of religious festivals and a life ritual for family reunions and the transmission of blessings.

4. MULTIMODAL LITERACY INSTRUCTION PRACTICE BASED ON DICTIONARY DATABASES

Multimodal literacy instruction is an advanced form of dictionary-involved instruction. Its theoretical foundations integrate cognitive psychology, constructivist learning theory, and second language acquisition theory. Its core goal is to cultivate learners’ comprehensive language literacy and critical thinking skills in a multimodal and cross-cultural context. As a multimodal tool integrating vocabulary, knowledge, and culture, the media-integrated dictionary database provides an ideal vehicle for multimodal literacy instruction. This section explores the specific application paths of dictionary databases based on the two core approaches to multimodal literacy instruction: contextualized practice and explicit instruction.

4.1 Integrating Contextualized Practice with Dictionary Contextual Semantics

The core of contextualized practice is to connect teaching activities to real-world contexts, enabling learners to

understand and apply language in real-world scenarios. Multimodal dictionary databases support contextualized instruction through a combination of “contextual semantics construction and simulated practice.”

4.1.1 Multimodal Construction of Situational Semantics

The dictionary database uses definitions, examples, and multimodal resources to construct complete semantic contexts for the defined words, helping learners establish a “vocabulary-context” connection:

Basic context construction: Common vocabulary is matched with typical contexts, such as “la boulangerie” with a bakery shopping scene, providing text descriptions (“Shops selling bread and pastries are an important place for French people to buy things on a daily basis”), images (baguettes and croissants displayed in a bakery window), audio (French shopping conversations such as “Bonjour, donne-moi une baguette et un pain au chocolat.” and “Ça fait 4 euros, s’il vous plaît.”), and videos (the complete process of a customer selecting pastries, paying, and the clerk packing them).

Cultural context construction: Cultural-specific vocabulary is matched with cultural contexts, such as “le mariage civil français.” For example, a French civil wedding scene is matched to a video showing the couple taking their vows and exchanging rings before the mayor at the city hall, with text explaining its cultural significance (“A French civil wedding is a core ceremony with legal force, formalizing the recognition of a marriage”).

Dynamic scenario construction: Action vocabulary is matched with a process video, such as “cuisiner le coq au vin” with a step-by-step video of making “coq au vin” combined with text explaining the key steps of each step, such as “marinating the chicken, sautéing the vegetables, and then stewing in red wine,” this helps learners understand the specific process of making “coq au vin”.

For example, when learning “le marché,” the database presents scenarios including images of fresh fruits, vegetables, and cheeses on a stall, audio of vendors haggling with customers in French, videos of people selecting ingredients, and the example sentence “Le marché a lieu tous les matins, on y trouve des produits frais.” Through multi-sensory experience, users can fully understand the meaning and usage of “le marché.”

4.1.2 Simulation Practice Design

Based on the scenario resources in the dictionary database, teachers can design a variety of simulation practice activities to strengthen the application of French vocabulary in context: Role-playing Dialogue: The database provides templates for real-world scenarios such as “supermarket shopping, train station ticket purchase, and restaurant reservations.” Learners choose a role (e.g., “customer/cashier” or “passenger/conductor”) and complete the dialogue using common sentence patterns

provided by the dictionary (e.g., “Est-ce que vous avez des tomates fraîches?” or “Je voudrais un billet pour Lyon, s’il vous plaît.”). The system corrects language errors in real time.

Situational Writing Exercise: Based on a specific scenario (e.g., “weekend trip”), learners extract relevant vocabulary (e.g., “itinéraire, gîte, activité, paysage”), examples, and cultural background from the database, and write a short essay describing their weekend plans. The system provides collocation suggestions and grammar checks.

Multimodal Presentation Task: Learners work in groups, using images and videos from the database, to create a short essay about “traditional French festivals.” A PowerPoint presentation explains holiday customs in French (e.g., “The origin of crepes during the Chandeleur Festival”). Teachers evaluate the presentation based on content accuracy, language expression, and multimodal application.

Contextualized practice transforms abstract French vocabulary into concrete applications, avoiding rote memorization and significantly improving learners’ French proficiency.

4.2 Combining Explicit Instruction with Dictionary Micro-Information

Explicit instruction emphasizes helping learners clearly grasp the micro-level knowledge of French vocabulary (morphology, grammar, syntax, and collocation) through clear metalanguage (such as grammatical terms and semantic explanations). The dictionary database provides comprehensive support for explicit instruction through “systematic annotation + precise guidance.”

4.2.1 Explicit Presentation of Dictionary Micro-Information

The database systematically annotates French vocabulary with micro-information to ensure clarity and comprehensibility. This includes:

Morphological annotation: nouns are annotated with gender and irregular plurals (e.g., “le cheval - les chevaux,” “la souris - les souris”), adjectives are annotated with gender variations (e.g., “beau - belle,” “vieux - vieille”), and verbs are annotated with irregular conjugations (e.g., “être: je suis, tu es, il est; avoir: j’ai, tu as, il a”);

Grammatical annotation: Nouns are annotated with countable/uncountable (e.g., “le pain [C/U],” “la joie [U]”), adjectives are annotated with quality/qualitative attributes (e.g., “grand” is a quality adjective, “ce” is a qualitative adjective), and verbs are annotated with transitivity (e.g., “manger [vt],” “courir [vi]”);

Syntactic annotation: Common syntactic structures, such as verb, “demander” is annotated as “demander qch à qn” and “demander à qn de faire qch,” and the noun “professeur” is annotated as “le professeur de + discipline (le professeur de français).”

Collocation annotations: Distinguish between fixed and common collocations, such as “prendre un café” (fixed collocation) and “boire un café” (common collocation), and indicate the collocation’s register (formal/informal), such as “partir” (general) and “se diriger vers” (more formal).

For example, the database annotation for the adjective “certain” reads “[Quality adjective, gender changes: certain - certaine; when used as a predicative, it is often “être certain de qch/que + clause,” and when used as an attributive, it is fronted],” clarifying its morphological variations, syntactic position, and collocation structure to help learners use it accurately.

4.2.2 Explicit Instructional Practice

Teachers design systematic explicit French instructional activities based on dictionary micro-information:

Knowledge Explanation: Instruction focuses on dictionary annotations. For example, when explaining the syntactic structure of verbs, using “pouvoir” as an example, combined with the database annotations of “pouvoir + inf. (je peux parler français)” and “être capable de + inf. (more formal, il est capable de résoudre le problème),” students are helped to clearly understand the differences in usage between different structures through examples and animations.

Comparative Analysis: For easily confused words, students are guided to compare dictionary annotations, such as “passer” and “passer par.” Comparative tables are created based on the semantic differences provided by the database (“passer” means “to spend time,” “passer par” means “to pass through a place”) and collocation rules (“passer un week - end,” “passer par la rue”).

Specific Exercises: Design exercises that focus on micro-information, such as “Filling in the blanks with the masculine and feminine adjectives” (The system automatically corrects incorrect choices based on dictionary annotations, providing links to annotations for incorrect options (e.g., if you incorrectly choose “passer” or “prendre,” you’ll be linked to the “Verb Collocations” page).

This explicit guidance helps learners establish a clear French knowledge framework, avoid usage errors caused by ambiguity, and improve the accuracy of their language expression.

5. THRESHOLD EFFECT AND OPTIMIZATION STRATEGIES IN MULTIMODAL INSTRUCTION

Although multimodal dictionary databases provide strong support for foreign language teaching, research indicates that multimodal instruction exhibits a threshold effect (Hou Limin et al., 2021): when the cognitive input of multimodal elements reaches a certain threshold,

learners’ vocabulary comprehension and application abilities significantly improve; however, beyond this threshold, excessive multimodal information distracts attention, hinders information transfer, and reduces learning efficiency. Therefore, it is necessary to explore optimization strategies for multimodal instruction that balance information input and cognitive load.

5.1 Theoretical Basis and Manifestations of the Threshold Effect

The threshold effect is essentially a dynamic balance between “limited cognitive resources” and “information input complexity.” According to cognitive load theory, learners’ working memory capacity is limited. Sweller’s Cognitive Load Theory (CLT) further categorizes cognitive load into three categories: intrinsic cognitive load (determined by the complexity of the learning task itself, such as the difficulty of the French compound past tense rules); exogenous cognitive load (ineffective load caused by the way information is presented, such as the overlay of redundant multimodal resources); and relevant cognitive load (effective load that promotes knowledge construction, such as complementary text and animated grammatical analysis). The “threshold” of multimodal instruction is essentially the point at which the exogenous cognitive load exceeds the relevant cognitive load. When multimodal resources are presented in a complementary format (such as the textual explanation of “le marché aux puces” combined with a live video and audio of a vendor), the proportion of relevant cognitive load increases, promoting knowledge absorption. When resources are redundantly overlaid (such as repeated text, audio, and animation), the exogenous cognitive load increases dramatically, exceeding the threshold and triggering cognitive overload. When multimodal information exceeds their processing capacity, cognitive overload occurs, leading to decreased learning efficiency. Mayer (2021)’s “redundancy principle” further points out that redundant multimodal information (such as repeated text and audio) interferes with learning, while complementary multimodal information (such as text + images) facilitates comprehension. This theory is directly related to the resource design of multimodal dictionaries. For example, if the teaching resources of “le marché aux puces (flea market)” in the database simultaneously include “real-life video of the stalls + audio of the vendors’ conversations + text description of the scene”, the three will respectively undertake the complementary functions of “visual scene presentation”, “auditory interactive restoration” and “core information extraction”, which conforms to the positive application of the “redundancy principle”. At this time, the cognitive input has not reached the threshold and can promote learning; However, if the additional “animated explanation of the same scene” is added (the content is repeated in the video and text), the external cognitive load will continue to accumulate and exceed

the relevant cognitive load. At this time, multimodal information will change from an “auxiliary tool” to a “cognitive interference source”, which is consistent with the core idea of “redundant information weakens learning efficiency” in cognitive load theory. Therefore, the key to the threshold effect lies in the degree of complementarity between modalities, not the amount of information.

In multimodal teaching supported by media converged dictionary, the threshold effect is mainly manifested in the following ways:

Positive effect (below threshold): Appropriate multimodal information (such as text + audio + images) activates multisensory cognition, enhancing learning interest and retention. For example, when learning the word “elephant,” the combination of text + images + audio significantly outperforms text alone.

Negative effect (above threshold): Excessive multimodal information (such as text + images + audio + video + animation) leads to cognitive overload, making it difficult for learners to focus on core knowledge. For example, when learning the simple word “book,” superimposing resources such as videos and animations can distract attention and reduce learning efficiency.

Research by domestic scholars Wu and Zhao (2014), He (2016), and others has also confirmed that reasonable multimodal teaching can liven up the classroom atmosphere and improve efficiency, but excessive use will have the opposite effect.

5.2 Optimization Strategies for Multimodal Instruction

When media converged dictionary uses technology to integrate multimodal information to aid instruction, a threshold effect exists. When the amount of multimodal information integrated by technology does not exceed cognitive load, it can improve learning outcomes. However, excessive overlaying of redundant modalities can lead to cognitive overload. Given this threshold effect, multimodal instruction should adhere to the principle of “few but good,” maximizing efficiency through personalized adaptation, modal collaborative optimization, and dynamic adjustment.

5.2.1 Personalized Adaptive Design

Based on user data in the database (learning stage, style preferences), a tiered teaching strategy is implemented: beginners rely on the low-modality combination of “text + basic audio” (to reduce external cognitive load), while advanced learners can unlock the high-modality combination of “in-depth cultural videos + interactive exercises”; at the same time, based on the “modal usage frequency” recorded by the user interface (for example, visual learners click on images more than 60% of the time), the resource push priority is automatically

optimized. This strategy is implemented based on the personalized technical function of Section 3.1.4. The core is to match cognitive needs through data-driven, in line with the CLT principle of “adapting to the learner’s cognitive level.”

Adaptation for learning stage: Beginner learners’ default to a low-modality combination of “text + basic audio + simple images” to avoid information overload. Essentially, this approach reduces external cognitive load by reducing unnecessary multimodal resources, in line with CLT’s recommendations of “matching learners’ cognitive levels.”

Adaptation for learning style: Visual learners will default to prioritizing images and videos; auditory learners will default to audio playback; and reading learners can choose to display only text to reduce modal interference;

Adaptation for task requirements: When searching for word meanings, the default is a concise combination of “text + audio”; for in-depth learning (such as lesson preparation or writing), multimodal resources such as videos and cultural interpretations can be expanded. For example, when students preview new words, the system defaults to displaying textual definitions and standard pronunciation. During review, students can choose to watch example videos and practice collocations, allowing for on-demand adjustments.

Strategy implementation relies on the user interface data logging functionality of the database (see Section 3.1.4 for learning aids).

5.2.2 Modal Collaboration Optimization

The core of modal collaboration is to ensure the complementarity of multimodal information and avoid redundancy:

Core modal priority: For each knowledge point, identify one or two core modalities (e.g., vocabulary definitions centered around “text + audio,” grammar rules centered around “text + animation”). Other modalities are supplementary to avoid confusion between primary and secondary.

Redundant information elimination: Delete repetitive modal information. For example, content already explained in text should not be repeated in audio; scenes already clearly presented in images should not be redundantly presented in videos. Prioritizing core modalities (e.g., grammar teaching centered on ‘text + animation’), avoiding redundancy, and directly responding to CLT’s core proposition of ‘reducing external cognitive load’.

Appropriate modal timing: Follow a “core first, supplementary later” sequence. For example, when learning “dance,” first display the textual definition and basic movement images, followed by the video, to avoid overwhelming students with a complex video at the outset.

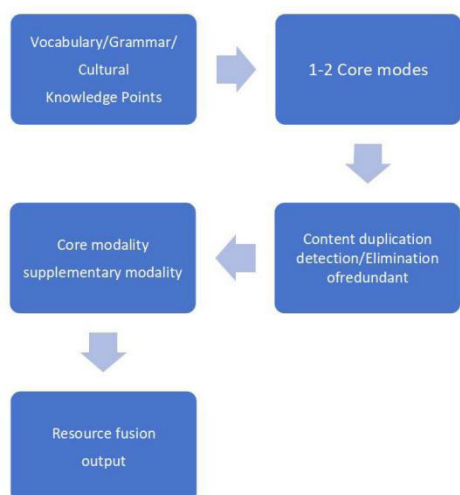


Figure 2
Modal collaborative optimization flow chart

5.2.3 Dynamic Adjustment Mechanism

The database should have dynamic adjustment capabilities to optimize multimodal information based on learner feedback and performance:

Real-time Feedback Adjustment: Information applicability is assessed based on user action data (e.g., skipping a modal resource or repeatedly watching a video), automatically reducing redundant modalities and increasing popular ones.

Learning Outcome Adjustment: The effectiveness of multimodal information is analyzed based on test scores. If a video resource for a particular vocabulary word fails to improve learning outcomes, the system will automatically replace it with a simpler image.

Teacher Intervention Adjustment: Teachers can adjust the presentation of multimodal information uniformly within the teaching backend based on class performance. For example, they can add animated demonstrations to address grammar points where the class is generally weak.

Through optimization strategies, multimodal teaching can strike a balance between “information sufficiency” and “cognitive load,” fully leveraging the advantages of media converged dictionary while mitigating the negative impact of threshold effects.

6. CONCLUSION & RECOMMENDATIONS

This paper systematically reviews the four-stage development of dictionary-assisted language instruction. It analyzes the structural characteristics, teaching integration paths, and user management mechanisms of Integrated media converged dictionary databases. It explores a multifaceted literacy instruction model based on contextualized practice and explicit guidance practice. Furthermore, it reveals the threshold effect and optimization strategies of multimodal teaching supported

by media converged dictionary. The study reached the following core conclusions:

The development of dictionary-assisted language instruction is a process of continuously strengthening user awareness, from an early focus on the user perspective to a user-centered approach, then to differentiated needs research, and ultimately to the active integration of dictionaries into instruction. Each stage of change has promoted the deep integration of dictionaries and instruction.

Media converged dictionary databases, by integrating multimodal information and optimizing storage and interface design, have become core resources for foreign language instruction. They can be deeply integrated into vocabulary, grammar, and cultural literacy instruction, providing comprehensive support from before, during, and after class.

Multimodal literacy instruction combines dictionary knowledge with multimodal practice. Through contextualized, explicit instruction, critical framing, and transformative practice, it effectively improves learners’ language proficiency, cultural literacy, and critical thinking.

Multimodal teaching supported by media converged dictionary has a threshold effect, requiring personalized adaptation, modality co-optimization, and dynamic adjustment to balance information input and cognitive load, maximizing instructional efficiency.

Future research can prioritize three empirical explorations:

(1) Short-term empirical research: Select intermediate French learners (CECRL B1-B2 level) to compare the vocabulary acquisition efficiency of using media converged dictionary and traditional paper dictionaries, focusing on measuring the correlation between “multimodal resource type” and “cognitive load”;

(2) Long-term follow-up: Follow up learners who use the database for 1-2 semesters to analyze the longitudinal changes in their grammatical application ability and cultural communication ability;

(3) Cross-cultural validation: Test the adaptability of the database in other foreign language teaching scenarios such as Chinese and Spanish to verify the cross-lingual universality of the multimodal design.

Future research could also expand in the following directions:

First, explore the deep integration of artificial intelligence technologies (such as large language models) with dictionary databases to achieve more intelligent personalized push notifications and interactive Q&A;

Second, conduct long-term empirical research to verify the long-term effects of multimodal teaching supported by media converged dictionary on language proficiency;

And third, focus on the localized design of dictionary databases in cross-cultural contexts to meet the needs of

learners in different regions. As a key tool for innovation in foreign language teaching, the development and application of media converged dictionary will provide broader space for the informatization and personalization of language education.

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