

# Multimodal Representation of Online Dictionaries to Assist Medical English Listening, Speaking, and Viewing Classroom

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**Abstract:** Multimodality refers to the blend of different symbol systems, like music and text, used in communication or behavior. Modality is how humans interact with the external environment, like objects, animals, or machines, through their senses, including sight, hearing, touch, and so on. Meaning is achieved by integrating multiple modalities. Through social use, all modalities become conventionalized, forming symbolic resources. All natural discourse is multimodal. Online dictionaries utilize new media devices like smartphones, tablets, and laptops. With the rapid development of network technology, online dictionaries are increasingly incorporating multimodal representations. In addition to providing textual definitions, examples, and other information, they are incorporating visual, auditory, olfactory, and gustatory elements, stimulating learners through multiple senses. This promotes the transition from binary reading to multi-modal reading comprehension. The Ministry of Education's 2020 revised "University English Teaching Guide" states that ESP (English for Specific Purposes) focuses on strengthening students' ability to communicate academically and professionally in English, thereby enhancing their academic and professional skills. "Medical English Listening and Speaking" is one of the foundational ESP courses in medical English and plays a vital role in language teaching. This paper aims to explore how multimodal representations in online dictionaries can be applied to medical English listening and speaking classroom instruction, drawing upon practical examples from Youdao Dictionary and Longman Dictionary of Contemporary English (6th Edition). Teaching in Medical English Listening and Speaking courses is primarily divided into three modules: a vocabulary module as the foundation of language input, a listening

video module for text input, and a translation or question-and-answer module emphasizing language output functions. The entire teaching process can be divided into pre-class vocabulary preparation, in-class listening input, and post-class translation or question-answer language output. Integrating the multimodal representations of online dictionaries with these three stages can facilitate the comprehensible input of language, leading to improved language output.

**Keywords:** Multimodal Representation; Online Dictionary; Classroom Practice

## 1. Introduction

The fundamental purpose of modern medicine is to promote health. Medicine will develop towards a predictive, preventive, and personalized direction, focusing more on managing a person's health rather than controlling their diseases. Qualified talents engaged in medical and health care should not only take care of their own physical and mental health but also apply modern health concepts and scientific knowledge to promote the health of the general population. The 2020 revised "University English Teaching Guidelines" issued by the Ministry of Education pointed out that specialized English for specific purposes aims to enhance students' ability to use English for academic communication and professional work, and improve students' academic and professional qualities.

Based on this objective, our school offers a variety of general elective courses in Medical English throughout the year, including Basic Medical English, Medical English Reading and Writing, and Medical English Listening, Speaking, and Viewing. As one of the foundational courses, Medical English Listening, Speaking, and Viewing holds a crucial position. As the saying goes, 'If you don't listen, you can't

speak; if you don't speak, you can't read; if you don't read, you can't write.' The 'listening and speaking' component is considered the primary aspect of language teaching. The Medical English Listening, Speaking, and Viewing course uses the specialized English textbook 'Contemporary Medical English Listening, Speaking, and Viewing Course—Health Promotion,' published by Fudan University Press, which aims to integrate English with students' medical specialties. Judging by the number of students enrolling each semester, the Medical English Listening, Speaking, and Viewing course is highly regarded by students[1].

This article aims to explore how the multimodal representation of online dictionaries, using Youdao Dictionary and Longman Dictionary of Contemporary English (6th Edition) as examples, can be applied to classroom teaching in Medical English Listening, Speaking, and Viewing.

## **2. Online Dictionaries and Multimodal Classroom Teaching**

### **2.1 The Prevalence of Online Dictionaries**

The rapid development of internet technology and the continuous advancement of communication devices have made smartphones, tablets, and laptops the most widely used new media today. Online dictionaries have emerged to meet the demands of the times. In addition to the traditional five major English dictionaries—Oxford, Longman, Collins, Macmillan, and Cambridge—each launching their own apps or online dictionaries for readers, platforms like Youdao, Bing, Baidu, and Jinshan Ciba have also provided downloadable apps, becoming highly popular among readers.

Research indicates that in receptive language activities, a significant portion of college students, about 52.23%, use electronic dictionaries (Zhang 2015). With the widespread adoption of new media terminals, the usage rate of paper dictionaries has sharply declined. Surveys show that only 4% of students frequently use paper dictionaries, 26% use them occasionally, 51% rarely use them, and as many as 19% never use them at all. In contrast, 91% of students frequently use electronic dictionaries, with only 3% rarely or never using them (Zhang 2017)[2].

### **3. Multi-modal Representation of Online Dictionaries**

Online dictionaries, carried by new media terminals such as smartphones, tablets, and laptops, are convenient and fast, adaptable to various occasions. Without the constraint of physical space, online dictionaries usually contain more detailed information and a broader vocabulary than paper dictionaries. Additionally, online dictionaries increasingly embed multimodal representations. Beyond providing textual definitions and examples, they incorporate visual, auditory, olfactory, and gustatory elements, stimulating multiple senses and facilitating the expansion of binary literacy to multimodal literacy.

The theory of multimodal discourse analysis emerged in the 1990s[3]. Linguists Kress and Van Leeuwen, building on Halliday's functional grammar theory, established a multimodal discourse analysis framework from a social semiotics perspective to analyze the functions of images, colors, and sounds in texts. Van Leeuwen posits that multimodality involves the synthesis of various modes of communication, such as music and text, in communicative activities or behaviors. Modes are ways humans interact with the external environment through senses like sight, hearing, and touch. Meaning is realized through the integration of multiple modes, and through social use, all modes become conventionalized, forming semiotic resources. All natural texts are multimodal (Kress & Van Leeuwen 2006; Royce 2007; Matthiessen 2007)[4].

Dictionaries are no exception. In dictionary definitions, the providing of multimodal contexts or multimodal elements in dictionary definitions can help second language learners and dictionary users interpret dictionary definitions (Yang 2013; Qian 2016)[5]. The compilation process integrates various modal symbol systems, such as written text, layout, and images, to facilitate communication between dictionary compilers and users. The modal representation of dictionary definitions is rich. For example, visually, there are text, symbols, dynamic/static graphics, dynamic/static images, gestures, actions, colors, and structures; aurally, there are phonetics, static/dynamic sounds, and sound symbols; tactilely or visually-tactilely, there are dynamic/static tactile sensations, including shape, temperature, texture, and other things perceived or experienced through body and visual contact (Zhang 2021)[6].

Taking the Youdao Dictionary and Longman Dictionary of Contemporary English (6th Edition) iOS mobile version as examples: The main interface of the Youdao Dictionary app presents the pronunciation, phonetic notation, part of speech, Chinese definitions, and inflectional forms of the queried word. By scrolling down or using the mouse, users can view authoritative dictionary explanations from sources like Oxford, Webster, and the Collins English-Chinese Dictionary. Users can switch between definitions using the mouse to select the most suitable one. By clicking on various parts of the main interface, users can access related phrases, synonyms, etymology, example sentences (including bilingual, original, and authoritative examples), and encyclopedic information about the word.

The Longman 6 app's main interface includes word search, special columns (comprehensive phrases, word collocations, encyclopedia entries, illustrated vocabulary, word analysis, grammar focus, authentic expressions), daily learning, word memorization plans, and customizable learning sections. In the core word search page, besides standard British and American pronunciations, phonetic notation, parts of speech, and Chinese definitions, it provides category labels (such as Core 6000, W2, AWL, college entrance exam, postgraduate exam, CET-4, CET-6), and a pie chart indicating the word's usage frequency, which further displays the frequency distribution of definitions and parts of speech.

The arrangement of definitions in Longman 6 differs from Youdao. Longman 6 separates definitions by meaning, accompanied by examples and related phrases, allowing users to click any word for further inquiry. In contrast, Youdao aggregates all definitions, with example sentences and related phrases listed separately.

Discussing the multimodal representation of the two dictionaries mainly involves visual, auditory, and tactile modes. Visually, both dictionaries use various fonts and colors to highlight core elements of definitions or examples. For instance, in Longman 6, text explanations are in black on a white background, with bold for collocations and italic with a background color for explanations. The page design uses soft cool colors to highlight and distinguish functions, such as green for core vocabulary and light blue for definitions, with light yellow background and brown italics for examples, aligning with

scientific color schemes for eye protection and a calm mindset during learning. Bright warm colors indicate American pronunciation, parts of speech, and word categories, such as for college entrance exams, postgraduate exams, and CET-4/6. Red or orange highlights signal important points for learners.

Auditory modes include pronunciation and sound modes. In the digitization of print dictionaries, pronunciation has become widely used, evolving from word pronunciations to full sentence readings and now video pronunciations. Longman 6 features alternating male and female voices, providing smooth and calm pronunciations. This method offers learners standard pronunciations of specific words, which are formal and authoritative for imitation. Longman 6 also supports recording, allowing learners to compare their readings with the standard pronunciations and receive scores and feedback. The integration of sound and pronunciation modes enhances self-assessment and human-computer interaction, making learning more engaging.

Auditory and visual modes can merge into videos, presenting semantics and pragmatics intuitively. Longman 6's micro-lesson section exemplifies this, covering a wide range of topics from grammar to idiomatic expressions, aiding in memorizing commonly misspelled or confusing words.

Tactile modes involve triggering dictionary queries or opening vocabulary-semantic links through mouse clicks, finger taps, or spoken words. In Longman 6, each entry has various links. For example, with the word "bicycle," users can access definitions, parts of the bicycle, and micro-lessons on the prefix "bi." Clicking on different definitions allows users to fold or unfold Chinese definitions, English definitions, or illustrative examples.

Tactile and visual modes can also integrate. For example, in the phrase section, clicking a phrase links to the correct page, with a flashing red dot highlighting the meaning, drawing attention.

#### **4. Utilizing Online Dictionaries to Assist Classroom Teaching**

Multimodal teaching emphasizes developing learners' multi-literacy skills by utilizing various channels and teaching methods such as the internet, images, role-playing, etc., to engage learners' multiple senses and facilitate their active participation in language learning. In

classroom teaching, multimodal teaching is implemented in a multimedia environment where teachers integrate language, images, sound, movement, and other meaning-construction tools to create the most effective means of expression. They also guide students to use multimodal tools to construct meaning and engage in communication, thereby achieving teaching objectives.

The teaching of Medical English listening and speaking courses is primarily divided into three modules: the vocabulary module as the basis for language input, the listening video module for text input, and the translation or Q&A module emphasizing language output. The entire teaching process can also be divided into three stages: pre-class vocabulary preparation, in-class listening input, and post-class translation or Q&A language output. We attempt to integrate the multimodal representations of online dictionaries with these three stages to facilitate comprehensible language input and achieve better language output results.

Below, we use the first chapter of Medical English listening and speaking, "Healthy Lifestyle," as an example to explore the application of multimodal elements from online dictionaries in classroom teaching practice.

#### 4.1 Pre-class Vocabulary Learning

Medical English vocabulary can be categorized into three types: general English vocabulary, medical terminology, and amphibious vocabulary (words with different meanings in general and medical contexts). As a general elective course, Medical English involves listening and speaking tasks, with most vocabulary being general English, followed by amphibious vocabulary, and finally, medical terminology. Generally, the general English part is not very difficult; medical terminology can be accurately defined by consulting dictionaries, while amphibious vocabulary is often prone to errors.

With the help of online dictionaries, students can independently preview and master most general English vocabulary before class. Even common general English words can reveal new meanings when looked up in a dictionary. For instance, "lifestyle" is marked as a core word in the Longman Dictionary of Contemporary English, meaning "way of life." However, searching for "lifestyle" may lead to the phrase "alternative lifestyle," meaning "non-traditional/alternative

way of life." Further exploring "alternative" reveals that acupuncture, a traditional Chinese medicine practice, is used as an example for "alternative medicine/therapies," indicating that "alternative medicine" can also refer to TCM (Traditional Chinese Medicine). The subcategories of "alternative medicine" extend beyond just this example.

Learning medical terminology can also be enhanced with online dictionaries, providing more knowledge and information. For example, "diabetes" in the Longman Dictionary of Contemporary English not only translates to "糖尿病" (diabetes) but also includes grammatical information and related terms like "diabetic" and "diabesity." The tactile modality links to semantic information of different words. Apps like Youdao also offer etymology and related encyclopedic information.

By using online dictionaries to query, view illustrations, and link semantic information, students can independently complete pre-class vocabulary preparation[7].

#### 4.2 Classroom Teaching

In class, teachers can check students' pre-class preparation through small tasks like word definition matching, sentence completion, or crossword puzzles, followed by explanations of key vocabulary. This stage primarily addresses medical terminology and amphibious vocabulary. For instance, the term "cardiovascular disease" can be broken down into the prefix "cardio-" (heart) and the root "vascular" (vessel). When explaining the prefix "cardio-," teachers can use fuzzy search in the Longman Dictionary of Contemporary English to expand related vocabulary, such as "cardiology," "cardiologist," "electrocardiogram," and "electrocardiograph." The dictionary also provides micro-lessons on aerobic and anaerobic exercise, allowing teachers to decide whether to show these in class based on students' levels and class time.

Amphibious vocabulary like "disorder" can mean "mess; chaos" in general English, but in medical contexts, it means "disorder; dysfunction; disease."

#### 4.3 Post-class Exercises

Post-class exercises usually take the form of translation or Q&A practice. Based on the comprehensible input of vocabulary and texts in class, students complete post-class exercises to

produce language output, reinforcing language learning.

### 5. Limitations of Online Dictionaries

Online dictionaries sometimes lack sufficient support in example sentences, especially for amphibious vocabulary like "primary." For

instance, "primary" has the meaning "primary" in Chinese, but this is not reflected in the bilingual dictionary definitions and examples provided.

The explanation lacks consideration of semantic fields. It doesn't effectively analyze synonyms within the same semantic field.

[ usually before noun ] developing or happening first; earliest 最初的; 最早的

例: primary causes 最初的原因

例:

The disease is still in its primary stage. 这病尚处于初始阶段。 美

ADJ **Primary** is used to describe something that occurs first. 最初的

例: It is not the primary tumour that kills, but secondary growths elsewhere in the body.

致命的并不是原发肿瘤, 而是在身体其他部位的继发。

### pan·dem·ic

/pæn'demik/ 美 n.

a disease that spreads over a whole country or the whole world (全国或全球性) 流行病; 大流行病

### epi·dem·ic

/,epi'demik/ 美 n.

1. a large number of cases of a particular disease happening at the same time in a particular community 流行病

例: the outbreak of a flu epidemic 流感的爆发

例: an epidemic of measles 麻疹的流行

[ C ] ( informal ) an infectious illness that is usually fairly mild 轻微的传染病; 小病

例: a flu bug 流感

例: There's a stomach bug going round (= people are catching it from each other) . 现在流行一种肠胃传染病。

例:

I picked up a bug in the office. 我在办公室被传染了疾病。 美

——note at [disease](#)

### Figure1. Limitations of Online Dictionaries

### 6. Conclusion

In the era of multi-modal discourse, learners need to develop not just literacy skills but also diversified literacy abilities. Online dictionaries, as an indispensable tool for both English teachers and learners, can significantly enhance the development of English skills when their multimodal representation elements are used correctly. They can help learners overcome obstacles encountered during learning, highlight challenging aspects and common errors in language learning, and improve learning efficiency.

### Acknowledgement

The paper is supported by the Guangdong Provincial Department of Education's

International Training Program for Outstanding Young Researchers.

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