

The Necessity of Visual Presentation Design in Digital Foreign Language Teaching

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Abstract. Along with the development of information technology and innovation of teaching and learning methods, visual elements, such as images and graphics, being an indispensable method of representing and conveying knowledge, have become important components of digital teaching. However, without appropriate design of visual presentation, visual elements cannot authentically improve the efficiency and effectiveness of knowledge communication. The study emphasizes on the necessity of proper visual presentation design in digital foreign language teaching (DFLT) from the perspectives of second language acquisition and other theories, hoping to improve the efficiency of DFLT in modern teaching context.

1 Overview

With the evolution of society and the development of technology, the channels and ways of obtaining information have undergone dramatic changes. All kinds of visual information, such as graphics and images, spread all over people's work, study and life, and also play a leading part in information dissemination in modern society. In the field of education, the emergence and popularity of new learning methods have accelerated a new round of evolution of teaching methods¹, and various forms of visual elements have become an important part of digital teaching in the information age. The construction of digital foreign language teaching also has this trend, but at present, it has not dealt with the relationship between the expression and dissemination of foreign language knowledge and the visual presentation of teaching resources. Therefore, this research would introduce the concept of knowledge visualization into the development of digital foreign language teaching in an attempt to provide a reference for the visual presentation design of foreign language knowledge.

Teaching materials, if presented casually, can only make teaching activities into simple and inflexible sending messages, thereby reducing the learners' enthusiasm and getting them into conflict². Thus, it is of great significance to design and develop effective digital teaching methods with the combination of different types foreign language knowledge and suitable visual presentation strategies.

2 Visualization of Teaching and Learning

Pictures speak better than words. The images had been used to exchange ideas long before the emergence of the human words, and thus they became an important means of the human acquisition of information at that time³.

The history of the evolution of the primitive rock paintings and the hieroglyphics, which are distributed around the world, illustrates the basic role of the images in the acquisition of information and the learning of human beings.

After the emergence of the written language, the written text has become the preferred way to convey the information with its precise ideographic function, but the visual elements such as the images are still the important supplement and even the main content of the information transmission, because they are more attractive to the reader's eyes⁴. Founded in 1982, USA TODAY changed the traditional newspaper form, which was mainly in black and white, and a large number of colour images and charts were used to convey the news information. The practice was despised by some critics at the time that the newspaper would not succeed, but they turned out to be wrong. The newspaper was a huge success, being popular among readers with the highest circulation in the United States.

Nowadays, with the development of information technology and modern society, visual information such as graphics and images has been ubiquitous in human society, which has brought incomparable information experience to people's work and life⁵. The development of network technology and media technology is even more important. It has led to a quiet change in human information acquisition preferences and people prefer to accept visual information that saves their time in information interpretation and gives them deeper impression. The era of "picture-reading" has come, and the writing form and expressing skills of visual signs, such as pictures and images, are increasingly becoming the necessary means of survival and part of lifestyles⁶. Images can help people better create meaning in life and store emotions and thoughts; they help people enhance perception and understand complex concepts; they help

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people encode ideas, information and feelings in the brain to understand spoken, written and other communication content⁷; they help people remember and associate and promote better understanding of the world.

Education has always been an important field in the application of information technology in society. Czech educator Comenius once said that all knowledge begins with sensory perception. Vision, as the most important perceptual way of information acquisition, should become the main channel of knowledge acquisition. The visual information such as graphics and images have strong visual impact. Being vivid, informative, concise, lively and inclusive, it is easier to stimulate interest of information acquisition and to improve the efficiency of knowledge dissemination⁸.

Since the beginning of the new century, under the promotion of information technology, especially mobile communication, social network, media editing and other technologies, a variety of new modern teaching methods have emerged. Although these methods are different in connotation, they have a lot in common for teaching requirements, and paying attention to the visual presentation of knowledge is one of them.

Most of the contemporary students belong to digital aborigines. They prefer to obtain information through the internet and exchange information through pictures, videos and so on. Therefore, multi-channel sensory stimulation teaching methods can stimulate their interest in learning. It is noticeable that although the teaching methods of diversified visual presentation has advantages over traditional methods in many ways, it does not mean that these types of teaching methods must be absolutely suitable for learners, because the external presentation of knowledge has such an important influence on the cognition, understanding and dissemination of the inner content of knowledge, and even determines the quality of life and the direction of development of the inner content⁹. The visual presentation of foreign language teaching cannot be understood in isolation, but it should be examined in the dimension of knowledge dissemination

3 Rising of Visual Learning

Visual learning is generally considered as a means of acquiring knowledge from visual information carriers such as text, pictures, charts, films, television, computer media, with the aim of promoting the learning of learners and improving their cognitive and writing ability by means of visual sensory experience. Visual learning usually involves three basic cognitive activities: visual attention, visual perception and visual thinking, which are the basis and prerequisite for learners' visual learning.

It is believed that visual learning¹⁰ can transfer teaching content more effectively by making the learning process more pleasant and maintaining learners' interest in a particular subject for a longer time. Visual learning plays an important role in the field of special education. For learners with hearing impairment, most of the learning content comes from visual information. Therefore, obtaining language information in visual form

is the most effective way for them to learn. Gallaudet University set up The Science of Learning Center on Visual language and Visual Learning in September 2006, which brings together researchers from different disciplines and fields, such as cognitive science, linguistics, pedagogy, to study how visual language and visual learning can help deaf people acquire language and literacy, with the goal of deepening the understanding of language and knowledge acquired through visual channels.

In the context of the current information technology, visual learning has in fact developed into a universal way of learning. Both formal and informal visual learning has been integrated into people's lives and becomes a reading habit. Visual nonverbal symbols play an extremely important role in the process of visual learning. With the development of network technology and digital media technology, visual nonverbal symbols occupy most of the content of symbol system. Visual learning provides a series of scenes for learners, and visual cues can direct learners' attention to knowledge representation. A typical example of the application of visual learning in foreign language learning is the application of pictures in English vocabulary learning. Pictures can create an image to promote vocabulary understanding and memorization¹¹.

Visual learning is an indispensable way for foreign language learning where various visual elements are widely used. Learners carry out thinking activities around specific schema and situations to read information and new knowledge. Therefore, the visualization of language knowledge under the guidance of visual learning theory is the requirement of the era of reading pictures, and it is also the necessity of the further development of language teaching and research.

4 Visual Presentation in Digital Foreign Language Teaching

4.1 Digital Foreign Language Teaching

The emergence and development of digital foreign language teaching is closely related to the development of information technology such as network technology and media technology, and it is also closely related to the development and change of teaching philosophy. In the traditional teaching environment before the widespread popularity of computers and networks, foreign language teaching mainly refers to the use of teaching materials in the classroom and after-class practices. This kind of foreign language teaching method is oversimplified and not interactive, and the learners mainly receive knowledge passively, thus it is consistent with the "teacher-centered" teaching philosophy¹². The development of information technology provides a new perspective for the development of foreign language teaching. From desktop computers to mobile phones, tablets and other mobile terminals, from ordinary broadband networks to ubiquitous WIFI and 4G networks, from ordinary audios and videos to interactive videos that can be used for human-computer interaction,

digital foreign language teaching has been developing. The position of digital foreign language teaching has slowly surpassed that of traditional foreign language teaching, and it has become the mainstream direction of foreign language teaching. The construction of digital foreign language teaching has also become one of the key parts in the systematic project of educational informatization.

There is no universal definition of digital foreign language teaching. Some researchers define digital foreign language teaching as foreign language teaching through digital media content including but not limited to text, image, video and so on. The definition is too broad to explain the characteristics of digital foreign language teaching. To a great extent, digital foreign language teaching embodies the teaching philosophy of “student-centered”. Actually, it is a combination of both the promotion of students’ learning and assistance to teachers’ teaching.

4.2 Visual Representation

Representation is a cross-domain research problem. According to the point of view of information processing, when organisms process external information, such as information input, coding, conversion, storage and extraction, the information always appears in the brain in the form of representation. Representation is not only the reflection of objective things but also the object of processing. The processing of the same thing will also be different when the representation of it is different. From a psychological point of view, representation refers to the way in which information or knowledge is expressed and recorded in psychological activities, and it can also be understood as expression. It discusses the relationship between symbols and their references and how to use symbols to express and communicate. Representation also has its verb form “to represent”, and in this study the noun form concept would be the focus. When the noun representation is used, the ways and means to understand the world are given from the representation system. Therefore, representation is not only a reflection of the world, but also an interpretation of the world, and it defines and constructs the world through interpretation.

Visual representation is the use of visual elements to represent the information that needs to be transmitted. When used in the field of teaching, the object of visual representation is mainly specific subject knowledge, and its function is to promote learners’ cognition and construction of knowledge in a more reasonable way. Visual representation is one of the key factors of knowledge visualization¹³. The choice of visual representation not only determines the way of knowledge visualization, but also determines the effect of knowledge visualization to a great extent. Visual representation has a very important influence on the cognition, comprehension and dissemination of knowledge content, and it is an important factor that determines the quality and development direction of teaching.

From the angle of visual information processing, visual representation is a summary and classification of different representing forms of visual content, and it refers to the combination and application of the basic physical forms of visual content, such as shape, line, colour, position relationship and so on. Visual content can be represented by one or more kinds of visual representations. From the angle of knowledge dissemination, visual representation is the existence of both an entity and an abstraction, because the corresponding visual content is objectively presented in front of the readers, while the meaning of visual content requires subjective interpretation by the readers, and different readers may detect different meanings for the same visual presentation¹⁴. In this study, visual representation refers to the basic forms and methods used to represent the knowledge of foreign languages. This concept consists of two main features: first, each visual representation is a summary of the specific visual presentation forms with the same representation characteristics; second, each visual representation has unique advantages in transiting foreign language knowledge when compared to other kinds of visual representations¹⁵.

4.3 Visual Presentation

Visual representation sets the tone for the presentation of knowledge and embodies the overall design ideas of knowledge visualization, while visual presentation emphasizes the application of specific visual symbols and visual elements, which are the specific visual forms of visual representation¹⁶. Visual forms are the external expression form of knowledge content and the internal constituent relationship of visual representation, and they are also the physical form of visual sensory object and the embodiment of human visual gestalt ability. Visual forms can be divided into two levels: surface form and deep form. The surface form includes shape, colour, point, line, surface and other visual materials, while the deep form includes structural relations such as harmony, symmetry, balance and rhythm.

The concept of visual presentation is consistent with the concept of visual communication in the field of design. Visual communication refers to the analysis and induction of information according to the specific purpose of information dissemination, and also the design and production of basic elements such as text, graphics, colours, modeling and so on. It is the process of conveying visual information to the audience through visual media and affecting the audience¹⁷. Visual communication is the process in which the information sender uses visual symbols to transmit information to the recipient. Visual communication in the information age is not a simple combination of various information media but an integration of different forms of digital media information, such as texts, graphics, sounds, videos, animations, through the computer comprehensive processing. In this research, visual presentation is defined in the setting of foreign language discipline: foreign language teaching being the carrier,

representation of foreign language knowledge can be achieved through the surface and deep planning and design of various forms of visual symbols and visual elements, the purpose of which is to promote the representation of knowledge to follow the cognitive law of learners and to promote the learners' learning process and learning effect.

4.4 Second Language Acquisition and Foreign Language Teaching

In the Merriam Webster Dictionary, the term "acquisition" has three explanations: (1) learning and mastery by studying and practice; (2) a term of pedagogy, which refers to the use of learning to increase the intensity of the reaction and to add new ways of response, that is, the mastery of knowledge; (3) a linguistic term, it refers to the gradual and subconscious development of the first language through the natural application of it in the daily communication. As can be seen from the above explanation, acquisition can be used exclusively to refer to the acquisition of language knowledge and capabilities¹⁸.

Language is the greatest invention of mankind, and any human civilization achievement actually need to be preserved and passed through languages. Languages are also the most distinctive feature of human from other animals. However, language acquisition has always been a mystery. So far human beings have not really found the first language acquisition mechanism and process. The first language is the language that is first contacted and obtained after a person's birth, and usually the mother tongue of a person should be his / her first language. But the mother tongue and the first language are different. For example, the children born in the United States may first speak English, the first language of whom is English, rather than mother tongue Chinese. Second language is a concept relative to the first language, and we usually refer to it as the process of mastering a language other than the mother tongue through conscious learning or unconscious absorption in natural or guided circumstances. There are two types of second language acquisition. Type one refers to the second language acquisition in the daily communication, in which the second language is learned through direct communication with the native speakers. The second type is the second language acquisition in the classroom teaching, in which the second language is learned through the teaching of teachers in the classroom. Second language acquisition theory studies the characteristics and the laws of the individuals' learning of second language (including the third language and the dialects, etc.).

There is a difference between a second language and a foreign language, although the difference between the two is controversial. Generally speaking, a foreign language refers to a language that is not spoken or not used by native residents. For example, for Chinese mainland learners, English is a foreign language, because English is not the language used by mainland residents. In countries such as India, where English is

one of the official languages, English is a second language for residents whose mother tongue is not English, because English is also widely used by native residents. Thus, it can be seen that there is a conceptual difference between second language acquisition and foreign language learning¹⁹. However, some scholars believe that the reader's reading process is the same even with different language backgrounds, so it is meaningless to draw a strict line between second language acquisition and foreign language learning. The two are essentially the same. In the field of language teaching, second language acquisition theory is usually used to guide foreign language learning. Although these theories cannot be directly used to solve foreign language classroom teaching problems, they are the theoretical basis of many foreign language teaching methods and of huge influence. This study recognizes the differences between second language and foreign language in acquisition environment but holds that there is no essential difference in acquisition laws between the two. In this study, "a foreign language" does not refer to a specific foreign language. But in the practical operation, the main object of this study is English teaching. This study takes English as the typical representative, but the viewpoints put forward are suitable for the teaching of other foreign languages.

4.5 Interlanguage

In the process of second language acquisition, learners will inevitably make all kinds of mistakes about the target language. Many mistakes are common to learners of the same social group and can reflect some general laws of second language acquisition. Selinker (1972) finds that second language learners would unconsciously establish in the process of learning a system that is different from but dependent on the mother tongue, and thus the concept of "interlanguage" is put forward. According to Selinker's definition, an interlanguage can refer to the characteristics of the ways and results of the individual's cognition of the target language at a specific stage of learning, which is a specific interlanguage, and it can also refer to the characteristic system that reflects the cognitive occurrence and development of all learners in the whole process of second language acquisition, which is a universal and abstract interlanguage language continuum. Selinker (1972) firmly believes that interlanguage is the only way to the target language in second language cognition. Adults have already passed the critical period of language learning, and the influence of mother tongue has become an irresistible force for adults to acquire a second language. As a result, adults will inevitably subconsciously use the rules of the mother tongue to recognize the rules of the target language when learning a second language. Therefore, the interlanguage of the target language appears. A case in point is pidginization. Chi-English is a pidginized language. For example, there is no post-attributive clause structure in Chinese, so it is not easy to understand the post-position of the English attributive clause for Chinese learners. Therefore, they

construct and use the interlanguage to recognize the English post-positive attributive clause. Learners can still master this rule quickly and skillfully and use it to express their ideas through the emphasis in teaching and the practice in communication.

4.6 Visual Presentation Design in Digital Foreign Language Teaching

Foreign language teaching has always been the frontier of the application of information technology in education. Attention to visual presentation is also an important part of digital foreign language teaching. English audio-visual courses can be said to be a typical example of its early application. At present, there are many digital foreign language teaching methods based on English language, but there is no scientific and reasonable system due to the lack of guiding principles for regulation, and the quality is not satisfactory. This study finds that the problems in visual presentation in digital foreign language teaching at present are as follows:

First of all, the knowledge expressiveness of visual presentation in digital foreign language teaching is insufficient. The teaching content carries the subject knowledge that needs to be transmitted to the learner, and the visual presentation mode of the teaching content can also be regarded as the way of knowledge presentation, and the way of the knowledge presentation determines the dissemination, acceptance and innovation of the knowledge content to a great extent. Therefore, the visual presentation of teaching content determines the extent to which it can play a role in the learning process. Visual learning emphasizes two factors, i.e., the information transmitted by the designer of teaching courseware and the information obtained by the learners, both of which run within the same framework of ideas and expectation. The designer should have a more accurate understanding of learners' expectations and an appropriate assumption of the effect of transferring knowledge that teaching can achieve. There are also many irrationalities in the teaching mode of "teacher + slides". The cooperation between teachers and slides is unreasonable, and the design of slides is relatively simple, which is basically based on texts and lacks visual clues to guide learners' attention. The limitation of ways of visual presentation will also result in the limited types of knowledge represented, which are basically lexical explanation, sentence pattern explanation and discourse explanation. While other important aspects of foreign language knowledge, such as pragmatic knowledge, cultural knowledge and so on, are rarely involved. In order to achieve better language learning effect, these aspects often need more representation.

Secondly, the visual presentation in foreign language teaching lacks adequate teaching interaction. Dewey once pointed out that individuals establish a framework that connects the subjective world with the objective world through interaction, so education is fundamentally an interactive process. Teaching interaction plays an important role in the effectiveness of language teaching. Moore (1989, pp:1-6) divides the interaction between

learners and teachers into three categories: the interaction between learners and teachers, the interaction between learners themselves and the interaction between learners and learning content. Millman (1994) believes that teaching interaction needs to take place through media intermediary in the learning situation supported by technology. Therefore, the interaction between learners and media interfaces was proposed. As the carrier of learning content and learning activities, learning resources are the main interactive objects of learners and channels for integrating various interaction potentials, for example, the interaction between teachers and learners also need to occur through learning resources. To achieve the expected effect, digital foreign language teaching must be carefully designed for its visual presentation interaction.

Thirdly, the visual presentation design of digital foreign language teaching does not fully follow the cognitive rules. Vision is a physiological concept, which refers to a feeling that light acts on visual organs and excites them, and information is processed by the visual nervous system. Vision is the most important feeling of human beings and animals, through which at least 80% of the external information is obtained. Visual perception is an ability in psychology, which is to analyze the visible light information accepted by the eyes and act accordingly. Therefore, visual perception includes two parts: visual reception and visual cognition. The behavior of acquiring knowledge by watching teaching resources is a more complex process of visual perception compared to ordinary viewing behaviors (such as scenery viewing), but in essence, it is still a visual information acquisition process and still needs to follow the general cognitive rules of human processing visual information. Visual presentation design requires creative combination of visual elements such as symbols, texts, colours, and models to design meaningful and aesthetic visual works, so as to disseminate the target information. The visual presentation design of the new era depends on digital media and focuses on the integration of vision and hearing with the characteristics of connectivity, interaction and dynamics. Scientific and reasonable visual presentation in digital foreign language teaching should conform to the cognitive laws of visual information acquisition and processing, so as to help learners to grasp the main contents of knowledge information more accurately and effectively and to promote the students' comprehension and transformation of knowledge.

Therefore, it is absolutely necessary to propose a proper visual presentation design to digital foreign language teaching, including the internal factors influencing the effects of digital foreign language teaching such as cognitive load, visual attention guidance, sense of social presence, etc. and the external factors including teacher's behaviors and classroom arrangement, perceptions of the learners, etc.

5 Conclusion

Along with the development of information technology and innovation of teaching and learning methods, visual elements, such as images and graphics, being an indispensable method of representing and conveying knowledge, have become important components of digital teaching. However, without appropriate design of visual presentation, visual elements cannot authentically improve the efficiency and effectiveness of knowledge communication. Therefore, visual presentation is a key factor determining whether digital foreign language teaching could reach expected results. This study advocates guiding visual presentation design of digital foreign language teaching (DFLT) with the theory of knowledge visualization. The study analyzes the theoretical foundation of foreign language knowledge visualization (FLKV). Hopefully, its visual representation framework will be explored in the future and a systematic series of DFLT visual presentation strategies will be proposed from the perspectives of second language acquisition and other theories, and the effects of the strategies will be tested in real foreign language classroom teaching by some proper methods. It is expected that this study would provide some theoretical support to and references for experience-oriented development of DFLT and for the people concerned, therefore to improve the efficiency of DFLT in modern teaching context.

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