



The Efficacy of Multi-modality on the Teaching Input and Learning Output of English Grammar

A Case Study of the English Grammar Videos on a Chinese Online Learning Platform

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Abstract.--The research on English grammar teaching is relatively limited compared to the research on vocabulary, speaking, reading, and writing. In contrast, heuristic or innovative English grammar teaching is more meaningful in the current trend of pedagogy innovation. This article takes multi-modal teaching as the research perspective, focuses on studying extracurricular English grammar teaching videos, and explores the impact of multi-modal English grammar teaching on L2 learners' extracurricular English grammar learning in both the input and output aspects. This article collected the quantitative data related to learner feedback from 80 English grammar teaching videos on the largest online learning platform in China and found that extracurricular L2 learners had a higher acceptance of multi-modal English grammar teaching videos than the uni--modal English grammar teaching videos.

Keywords:multi-modality; multi-modal teaching; uni-modal teaching; input; output; teaching efficacy

1 Introduction

Since the 1970s, second language acquisition has been widely applied and studied as a theoretical basis for English teaching. English teachers have also been exploring better teaching methods based on this theory. In the traditional teaching method of English grammar, teachers use single modal text to introduce grammar rules, and students memorize grammar rules mechanically before practicing the usage of the rules in sentences repeatedly. The drawbacks of this teaching method are undeniable: because of students' non-acquisition of the grammar rules, they are not able to use the grammar correctly when contexts change. Therefore, there is an urgent need for a type of grammar teaching that can promote students' spontaneous acquisition.

2 Literature Review

2.1 From Multimedia-aided Teaching to Multi-modal Teaching

Krashen's monitor theory, proposed in 1985, encompasses five aspects: the acquisition learning hypothesis, the natural order hypothesis, the monitor hypothesis, the input hypothesis, and the adequate filler hypothesis[1-2]. The monitor hypothesis involves the relationship between teacher input and student output. The monitor hypothesis suggests that L2 learners can only construct their language knowledge system through inputs embedded in effective communication processes, and the natural acquisition generated during the communication process will form an implicit system, which is a prerequisite for students' output[1]. From this perspective, Krashen's theory's emphasis on communication negates uni-mode language teaching. However, due to its ambiguity in detectability and quantitative description of facts, Krashen still needs to propose a feasible model to replace the uni-mode language teaching[1]. As the critical development of Krashen's monitor theory, the combination of Schmidt and Frota's Noticing Hypothesis and Swain's Comprehensive Output Hypothesis can be summarized as comprehensive input and comprehensive output, the accomplishment of which requires natural acquisition in both the input and output. Therefore, a teaching model that can match natural acquisition in these two stages is about to emerge. As a continuous development of Halliday's systemic semiotic system, Peter Menck specifically pointed out the role of teachers in the social network of language: interpreters and actors in multidimensional contexts[3]. Here, "multi-level context" is the embryonic form of another teaching mode opposite to the uni-mode teaching mode. The "multi-level context" in Peter Menck appears in many research literature as a form of multimedia teaching, which is also the initial form of multi-modal teaching. One of the primary significances of multimedia English teaching research is to propose the role transformation of teachers in English teaching, that is, to return the leading position of classroom teaching to L2 learners and at the same time highlight the guiding functions of teachers, including planning, organizing, suggesting, promoting, supervising, etc.[4].

2.2 The Definition of Multi-modal Teaching and its Research Domains

The concept of multi-modal teaching emerged in the early 21st century. Researchers such as Kress and Jewitt believed that knowledge teaching and learning should not be solely realized through text, instead, it should permeate various forms, including images, audio, video, body language, music, speeches, etc.[5-7]. Multi-modal teaching is not only a static concept, but also a dynamic relationship[7-8].

Based on the various modalities in multi-modal teaching, the roles and skills of learners in multi-modal learning have also changed accordingly. Learners engage more in independent thinking, assumptions, and planning and participate in traditional teacher tasks such as validation, contextual reconstruction, and learning space creation[7,9,10]. Other literature emphasizes learners' complex identity and multitasking attributes in multi-modal learning[8].

Based on the concepts and theoretical research on multi-modal teaching and learning mentioned above, a large number of applied studies have emerged. These practical studies on multi-modal teaching and learning can be classified as domains, modes, and contents, starting with multimedia teaching and extend to ICT-aided, online, and EAP English teaching and learning. Jetnikoff's research found that the use of ICTs in teaching has an inspiring effect on students' creative and critical output. However, as a multi-modal teaching method, ICT-aided teaching is limited by the teacher's preparation time, mastery of technology, and teaching equipment[11]. Wu's research found that using digital information technology in college English can stimulate the learning enthusiasm of L2 learners, improve their self-learning ability and learning effectiveness, and improve the quality of English teaching by 20%[12]. Sun found through a comparative study of traditional single-modal and multi-modal teaching methods that multi-modal online English teaching can achieve good results in natural science and engineering disciplines[13]. Laadem and Mallahi's research focuses on the impact of semiotic modes in multi-modal teaching on L2 learners and finds that multi-modal English teaching positively impacts learners' learning awareness and reading comprehension ability in higher education ESP teaching[14]. In addition, research on multi-modal teaching and learning also covers some areas of special education. Lee's research found that the arts-integrated teaching method has an excellent motivating effect on EFL students with poor learning motivation through a variety of non paper and pen tasks[15].

Regarding the different modalities in multi-modal teaching and learning, previous research has mainly focused on images, videos, and classroom layouts. Sihombing et al.'s research suggests that the use of colored images and animations in teaching can enhance L2 learners' understanding of conversational learning materials and their participation in teaching activities[16]. While the study by Vungthong et al. confirmed a positive correlation between the use of images in teaching and the EFL learning outcomes of L2 learners[17]. The author has demonstrated through observation of four classrooms in three schools that the spatial use, design, and display of English classrooms, as well as local government education policies, are all components of multi-modal English teaching and learning and have a sociocultural impact on L2 learners[8].

In addition to the domains and modes mentioned above, scholars also focused on studying the different parts of English learning: pronunciation, vocabulary, reading comprehension, writing, and grammar. Ryu and Boggs analyzed the current situation of multi-modal teaching of English composition in Korean high schools, pointing out that traditional uni-mode teaching is still the primary mode of teaching English in Korean high schools. The changes in multi-modal teaching mainly come from outside the school, that is, the pressure and influence of technological development in Korean society on Korean classroom education[18]. Carcamo et al., on the other hand, focused their research on multi-modal teaching and learning of English vocabulary and demonstrated the excellent effects of multi-modal English vocabulary teaching and learning through a comparative study of test scores in teaching order[19]. Due to the need to introduce fixed grammar rules to L2 learners during the teaching process of English grammar, the flexibility of using multi-modal teaching methods such as audio, video, and images in English grammar teaching, is considered to be limited compared to the mobility on teaching vocabulary and other aspects. Among the relatively little research

on multi-modal teaching of English grammar, Peters and Leuven's research indicates that the annotation and use of captions have a promoting effect on adult English grammar learning[20]. In Orozco and Martinez's study, over one-third of fourth-grade L2 learners in Buga's teaching facilities improved their English grammar scores, as well as their academic habits and attitudes, through multi-modal text learning[21].

Based on the main discoveries from the literature review, this paper set two research questions to address both the input and output part of multi-modal English grammar learning:

1. Does multi-modal teaching make the input of English grammar teaching more comprehensible for students?
2. Does multi-modal teaching help create a more comprehended output of English grammar teaching from students?

3 Methodology

This paper adopts both the quantitative data and qualitative interviews to analyze the selected English grammar videos.

The preliminary quantitative data in this study was collected from Bilibili, one of the most widely used and highly rated extracurricular learning platforms in China. Given that this study aims to evaluate the effectiveness of multi-modal English grammar teaching and learning, the publication time and duration of resources are not considered as the limiting conditions for resource selection. This research collected 80 English grammar teaching video and conducted a comparative study of two aspects: the first is a comparative study of user feedback between uni-modal English grammar teaching and multi-modal English grammar teaching, while the second is a comparative study of user feedback on two multi-modal combinations: "text+image+animation" and "text+image+simplified symbols". Both the comparative studies used the same variables for data analysis, namely the average data performance (average views, average likes, average coins invested, average favorites, average comments, average bullet comments, and average shares) and total data performance (total views, total likes, total coins invested, total favorites, total comments, total bullet comments, and total shares).

In addition to the quantitative data, this study conducted semi-structured interviews as well. Based on Andersch et al.'s communication model[22]. and the Ideal meaning conceptual model[23]. as the theoretical frameworks, seven semi-open interview questions are designed to study the impact of multi-modality on the teaching input and interviewees' learning output. The researchers selected three videos explaining the "if" conditional adverbial clause, using three teaching modes: single mode, "text+image+simplified symbol," and "text+image+animation." Six K9 students watched the three videos during the interviews. The order of video demonstration is: 1. Text based multi-modal teaching videos; 2. Multi-modal teaching videos with text, images, and symbols; 3. Text+animation multi-modal teaching videos. To avoid bias, the six interviewees were selected without considering their gender and class differences. A Grid chart is used to record the interview data.

4 Qualitative Data Analysis

In the first question's interview content, three interviewees preferred animation as the teaching mode to introduce grammar rules. From their answers, these keywords can be summarized and extracted: animation is easy to understand, rich and engaging in content, attracts attention, enhances learning interest, gets close to life, has a strong sense of immersion, has deep memory points, drives thinking, etc. Other two interviewees clearly expressed their favorite teaching mode as adding symbols to pictures and gave their reasons: the combination of pictures and symbols explains the knowledge points in detail and clearly; the text is rigid and easily distracted. It is worth noting that neither of these two student liked animation as a teaching mode.

Interviewee 5: *"I think the method, like the second teaching video, is better. It has a similar effect to video animation but is unlike the way the third video was organized."*

Interviewee 6: *"Actually, my favorite video is the second one because I think there are some grammar knowledge and, um, some questions that people did not understand at the beginning of learning English. It is very detailed and clearly explained to us. The first video is overly rigid, making it easy to get distracted. Moreover, I think the third one has too many animations, and I do not like them very much, anyway. The video is also concise, and I feel that it only talks about shallow issues. I do not have a complete understanding of the main topic. The explanation is not deep and comprehensive enough."*

From the above content, it can be seen that the interviewee does not accept traditional text-based single-mode teaching and learning but has preferences in the modes of images, symbols, and animations involved in the three videos. Students who choose animation believe that it helps improve their learning effectiveness because it activates deeper comprehension, fun, empathy, inspire thinking, and is close to daily life. Students who choose images and symbols place greater emphasis on the content and depth of their knowledge. It is worth noting that students who choose images and symbols consider both as a whole, that is, the two modalities must be combined in order to help them understand the knowledge points.

The preferences of interviewees towards different modalities can be analyzed in more detail from the fourth interview question, which is designed to study the specific teaching methods scattered across various teaching modes. For Example,

Interviewee 3: *"That's right. The teacher in the animation asks a question and then puts the student's avatar on top. When a student answers a question, the avatar actually shakes, and he uses this method to display the activity on the screen."*;

"Well, in the animation, the person on the left is the teacher, and the ones on the right are students. The teacher asks questions, and students on the right answer."

Interviewee 4: *"Visualization image, ah, this image is very prominent, yes, it is very prominent. Um, that clock, such as the future tense, gives you a clock to represent time. For Example, this part of the content may be confusing, so it puts a picture of a little rabbit, Yes."*;

"Well, the whole thing looks quite interesting.";

"And there is also this annotation, which is also clearly labeled through this frame and different colors. For Example, all 'if' s are labeled the same color. In the same

syntax, it is labeled as the same color. When enlarging the font, it appears to have a punctuation mark, which is a double quotation mark next to 'will' and 'now'."

Interviewee 5: *"When I see a comparison, it's divided into two colors, and the animation will be created bit by bit."*;

"It is on this screen. This way, it is obvious that subordinate clause differs between the main clause and the subordinate conjunction in this relationship. The subordinate clauses use the same color brush, and the main clauses use the same color. Yes, it is the color. Yes, it uses two colors."

Interviewee 6: *"As I mentioned, it was emphasized in detail, but the rest of the screen went black. Two words are specifically highlighted and then lashed twice to attract the student's attention. Some key points are also outlined. There is a red mark, and then there will be those with borders, and then this word will look different from the other words and attract our attention more. Yes, repeat the emphasis back and forth."*

It can be extracted from narratives of the interviewees that they have a consistent understanding of the first video: "The teacher just kept talking," "I could not distinguish the key points," and "feeling sleepy". For the multi-modal videos, students recognize the teacher's annotations on the text as symbols such as "separating two colors," "outlining," "some parts are black screen," etc.. Here, the interviewees show their confusion between annotations as a teaching aid that can be used in all modalities and symbols as an independent teaching mode, the reason of which is that these annotations play the same role as symbols, highlighting and emphasizing a specific part of the content in the text. Compared to that, the interviewees seem to have a clear capture of animation as a modality. According to their illustration, the highlighted and emphasized functions in animation are mainly achieved through more dynamic "shaking" and other methods.

It is worth noting that in the fourth interview question, in addition to the teaching methods provided in the question, the interviewees are also impressed by other teaching methods which impact their learning effectiveness positively. Among them:

Interviewee 2: *"Well, it is about helping students remember these important things better. Yes, it is about emphasizing or repeating them."*

Interviewee 4: *"Well, we can summarize it as, in my opinion, induction or summarization, in the ending part of teaching."*

The teaching method proposed by these two interviewees is repetition but at different levels. One is the simple repetition of the same grammar point, while the latter is a summary and inductive repetition based on the existing knowledge points. The purpose of these two types of repetition is the same: to highlight a certain part of the teaching content.

In another part of the interview content, the interviewees proposed another teaching method. The fifth interviewee emphasized, *"This should be a comparison between right and wrong."* *"It means that if we have something they do not understand and compare it in Chinese, the difficulty will be reduced. After all, Chinese is our mother tongue. Understanding it will be easier."* Here, the interviewee proposed comparative teaching. Based on the teaching content, the content of comparison can be diverse.

Interviewee 6: *"It is firstly about telling the students that this is not right, and then letting the students explore by themselves. When they discover the correct point, the*

students start asking questions on their own, proving that they already know where they are wrong, and then they take the initiatives to continue exploring the answers."

This teaching method is heuristic or guided error correction. Unlike the indoctrination-based error correction methods, step-by-step guidance enables L2 learners to recognize the problem and actively explore the correct answer spontaneously. The correct answer obtained in this way can be deeply grasped and should owe its contribution to active learning. While the answer obtained from passive learning is easy to forget on the one hand and cannot be truly comprehended and flexibly applied due to mechanical memory on the other hand.

Among the seven interview questions, the first and fifth questions ask students about their preferences for teaching modes. However, the teaching and learning stages are different: the first question is set for the lead-in and introduction of the grammar rules stages, while the fifth question is about explaining grammar rules. Therefore, the different modal choices made by the same interviewees when answering these two questions can reflect the modal preferences of students at different learning stages. In the first question, none of the six interviewees accepted uni-modal explanations of text sentences during the stages of lead-in and introduction of grammar rules. While in the fifth question, interviewees 2, 3, 4, 5, and 6 all agree that in explaining grammar usage, the text is one of the practical and necessary modalities, and combining text and other modalities can promote their understanding of grammar. For Example:

Interviewee 2: *"The text may be dull but clear at a glance, with symbols added to make it more eye-catching, and it also emphasizes example sentences."*

Interviewee 3: *"The text has example sentences and grammatical features as the knowledge points."*

Interviewee 4: *"The animation is interesting and easy to understand. The combination of animation and symbols is the most useful part, and the text is also useful, as it can clearly and directly show me the knowledge points. 'Text+images+symbols' are the most useful, and 'images and symbols' are not as useful."*

Interviewee 5: *"First, explain the grammar rules by using text, then use pictures or animations to demonstrate them. Hmm, then summarize and strengthen memory. These are combined. However, the first and foremost thing is the knowledge point, which is the text. This is a must-have. Yes, there must be, yes."*

Interviewee 6: *"Text and images are the best, so when I recall the grammar issue, I think of something closer to this knowledge. If it is animation, I might only remember the funny scene in it."*

From the interviewees' narratives above, it can be observed that L2 learners pay more attention to mastering the knowledge points at the grammar usage stage. In contrast, their attention to the fun and inspiration of learning decreases compared to their preference to these things at the lead-in stage. The content collected in the seventh interview question can also confirm this point. For Example:

Interviewee 1: *"Well, gestures can be used, but it may be complicated if there are too much. It just makes us feel too complicated and distracts my attention."*

Interviewee 4: *"The teacher's voice should be loud and friendly; don't be too strong or aggressive. The teacher's image should be gentle, don't be too serious, don't be too*

lively, and don't have too many gestures. Just have some gestures appropriately. If there are too many gestures, attention will be distracted."

Interviewee 5: *"I think a teacher's personality should be normal. I do not pay much attention to this aspect, I focus on the knowledge points."; "The screen should be concise, clear, and relatively clean. Hmm, there aren't too many words. Yes, there aren't many words, what the teacher said is more important. If the words are piled up, it may cause visual fatigue or something. The font could be a bit larger, but the teacher shouldn't read from the PPT."*

It can be seen that among the influencing factors of the external environment, students also pay more attention to factors that directly convey knowledge points, such as the font size of example sentences and the teacher's volume, rather than focusing too much on factors with weak correlation with knowledge points, including the teacher's gestures, personality, and PPT color.

The sixth interview question explores the impact of multi-modal teaching on the learning output of extracurricular L2 learners. The most helpful output modes chosen by the interviewee to consolidate learning outcomes include pictures or animations (interviewee 2), speeches (interviewee 3), essays (interviewee 4), fill-in-the-blank questions for new knowledge, mind maps, and speeches in the review stage (interviewee 5), and writing sentences on the blackboard or whiteboard (interviewee 6). The second interviewee was not able to express a clear preference for output methods. It is obvious that extracurricular L2 learners tend to believe that multi-modal learning methods are more effective in consolidating their learning outcomes during the K9 stage.

5 Conclusion

This article's analytical conclusions of the quantitative and qualitative research support and complement each other. The quantitative data analysis shows that compared to the uni-modal teaching videos, multi-modal teaching videos in the sample are more popular among L2 learners. Among various combinations of multi-modal teaching, L2 learners have better feedback on the combination of text, images, and symbols than the combination of text and animation. In the results of the qualitative analysis, at the stage of introducing grammar rules, all of the six interviewees preferred multi-modal learning methods, including animation, images, symbols, and changes in intonation made by teachers to emphasize specific knowledge. At the stage of explaining grammar rules, the number of interviewees who choose the combination of text, images, and symbols is greater than the number of interviewees who choose the combination of text, image and animation. On the other hand, since Bilibili does not breakdown the data of teaching videos into different teaching stages, the quantitative data collected in this article cannot reflect the differences in student feedback in each teaching stage. The qualitative data obtained from the interview, on the contrary, can compensate for this deficiency and identify the differences in the preferences of the interviewees for various teaching modes in the four stages of lead-in, introduction of grammar rules, explanation of grammar rules, and consolidation exercises.

In the study of qualitative data, this article has gained some new insights for future research directions in several aspects. Firstly, this article finds that the K9 L2 learners cannot tell the modality to which the adopted symbols belong, instead, they only focus on their functions, which indicates that the use of symbols in the explanatory notes may not inspire independent thinking for L2 learners at the junior level of secondary education. It seems that they are still in a habit of passive thinking and following the teacher's train of thought. This may expand new directions for future research, focusing on L2 learners' proper understanding of each modality under the limitations of teaching time and process. This study also reveals that extracurricular L2 learners prefer comprehensible, engaging, and immersive animations at the stages of lead-in and introduction of grammar rules, while reducing their attention to modal diversity and external stimuli at the stages of grammar rules explanation and practice, maintaining their choice of the teaching modes on texts and symbols which are more intuitive in emphasizing knowledge mastery. In the meantime, repetition and summarization with emphasis on the purpose, comparison in different ways, and the guided error correction may apply to various theoretical and applied models on L2 teaching methods.

6 Limitation

Due to the data collection limitations, this article could not investigate the impact of multi-modal teaching on the input and output of extracurricular L2 learners across a broader range of K12 grades. At the same time, the types of modes and their combinations in multi-modal teaching can also be further expanded to improve the effectiveness and reliability of the quantitative and qualitative research.

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