

Retraction

Retracted: 3D Video Analysis and Its Application in Developmental and Educational Psychology Teaching

Discrete Dynamics in Nature and Society

Received 23 January 2024; Accepted 23 January 2024; Published 24 January 2024

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Manipulated or compromised peer review

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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- [1] Z. Chen and L. Ding, "3D Video Analysis and Its Application in Developmental and Educational Psychology Teaching," *Discrete Dynamics in Nature and Society*, vol. 2022, Article ID 2551272, 9 pages, 2022.

Research Article

3D Video Analysis and Its Application in Developmental and Educational Psychology Teaching

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Received 7 April 2022; Revised 30 April 2022; Accepted 4 May 2022; Published 14 May 2022

Academic Editor: Zaoli Yang

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With the rapid development of information technology and network technology and the new requirements of education and teaching in the new era, 3D video technology has been more and more widely used in the field of education and teaching. Educational psychology plays a positive role in the field of education. Applying its relevant theories to classroom teaching is not only conducive to the establishment of a good teacher-student relationship but also helps teachers to understand the psychological characteristics and learning process of students, so as to greatly improve the quality of teaching. Therefore, this article is based on 3D video analysis technology, through the observation of the teaching video and coding, the verbal interaction between teachers and students' lines of code and data analysis, mainly to its frequency, specific length and single length data used for analysis, explores the lesson for the current situation of the teaching video case teacher's teaching behavior, commonness, and difference. From the perspective of learner psychology, the model of teacher's teaching behavior in MOOCs teaching video is constructed. On the other hand, from the perspective of coding system and learner psychology, this paper proposes the improvement strategies of teachers' teaching behavior in MOOCs teaching videos in China. The results show that the application of 3D video analysis method and educational psychology in student education can improve student work efficiency.

1. Introduction

In the 21st century, the rapid development of information technology is affecting every aspect of human activity, powered by technology, driven by information, driven by knowledge of the global new economy has been formed, these technologies changed the way people live, work, entertainment, at the same time in agriculture, medicine, engineering, education and other fields has a very important change [1, 2]. Students are always the main body of teaching; teachers should make clear this premise.

MOOCs have become a new way to meet the diverse needs of higher education because they can solve the problems of cross-space and sharing of educational information [3, 4]. At present, the improvement of the teaching effect of MOOCs has attracted extensive attention from the educational circles at home and abroad. Relevant researches mainly put forward suggestions and strategies to improve the teaching effect of MOOCs from the construction of

MOOCs platform, MOOCs teaching videos, and learners themselves. As the most important part of MOOCs, 3D teaching videos can directly determine the teaching quality of MOOCs. And the key of MOOC teaching lies in the teacher, who can impose teaching intervention on learners through specific teaching behavior [5, 6]. In other words, teachers' teaching behavior largely determines the quality of MOOCs teaching videos. As an important way to improve the quality of MOOCs teaching, it plays a very important role and value in meeting the emotional needs of learners and improving the quality of MOOCs teaching.

Classroom 3D video (see Figure 1) analysis method is a research method that researchers use video analysis software to analyze teachers' real classroom scenes based on recorded classroom videos and according to certain coding rules, so as to obtain classroom information such as teachers' classroom teaching behaviors. In the research, 3D video analysis method can facilitate researchers to repeatedly watch the content of teaching videos and encode and record [7, 8]. We



FIGURE 1: Classroom 3D video analysis.

can refer to the “class behavior and teaching media classification coding” proposed by scholars, combine with the precise definition of teaching, formulate the mathematics course teaching coding table, design the class video recording table, and use video analysis software to encode the selected class videos, and then analyze the data results. Therefore, from the perspective of 3D video analysis, this paper analyzes teachers’ teaching behaviors in MOOCs teaching videos, providing experience and reference for the design of teachers’ teaching behaviors in MOOCs teaching videos, and thus making certain contributions to the improvement of MOOCs teaching effects. Therefore, in general, the research objectives of this paper are: choosing high quality 3D video of classroom teaching, using the method of 3D video for selected cases evaluated with quantitative and qualitative analysis, from the research starting point, the framework structure, to explore the classroom teaching of junior middle school mathematics teachers’ behavior in the act of teaching of teaching structure and the correlation between them, and analyze the teacher’s teaching behavior sequence of hysteresis characteristics [7, 9]. Based on the analysis of the characteristics of teachers’ teaching behavior in high quality classrooms and the actual situation of Chinese education and the characteristics of subject teachers, this paper puts forward development strategies for teachers’ teaching development.

On the other hand, the teaching process is an activity completed by the interaction of teachers and students, with students as the main body and teachers as the leading part. The study of educational psychology not only contributes to the establishment of a good teacher-student relationship but also helps teachers to understand the psychological characteristics and learning process of students and adopt effective teaching methods, so as to better play a leading role and improve the learning efficiency of students [10, 11]. In the actual teaching process, teachers are required not only to combine the characteristics of the course but also according to the physiological and psychological characteristics of students of different ages, and adopt appropriate teaching methods under the guidance of the theory of educational psychology, so as to produce good teacher-student interaction and achieve ideal teaching effects [12, 13]. When carrying out 3D video teaching, teachers should focus on

students to determine the teaching content and teaching design.

Living in the rapid development of the 21st century, to a variety of new things to accept the speed of the relatively advanced thinking, new ideas, dare to say no to the old ideas, the courage to innovate, good at questioning, not satisfied with their current situation, but they also have the comparison, advocating famous brand of these relatively public problems [14, 15]. As the “post-90s” and “post-00s” grow up, education, especially student education, becomes more complicated and changeable. Current education to adapt to the new environment and change, mastering and application of a good education psychology theory and knowledge, a comprehensive understanding of students’ learning psychology, meet the students in the learning life concrete actual needs, to help students overcome all kinds of psychological barriers, so as to achieve the purpose of effectively improving the learning efficiency, it also proposed many challenges to our education workers [16, 17].

According to the principle of educational psychology, teacher-student relationship is the most basic and important interpersonal relationship in the educational process. The equal teacher-student relationship has a positive impact on the development of students’ cognition, emotion, and mental health [18, 19]. Because our teachers are in the leading position in teaching activities, this requires us to first change the traditional concept, put down the shelf of teachers, take the initiative to approach students, and form a new democratic, equal, and cooperative relationship between teachers and students. For example, secondary school students, first of all to understand the physiological and psychological characteristics of secondary school students. Secondary school students are in the period of adolescence between the age of 14 and 18 when they study in school, and this stage is their rapid physical and mental development, rich and intense emotions, and emotional fluctuations. This period is also the most prone to psychological problems, so teachers need to pay more attention to them. According to the psychological survey, students like the most is amiable, with a democratic style of teachers; what students hate most and even hate in their hearts are those authoritarian teachers [20, 21]. Therefore, teachers should respect students, get along with them on an equal footing, carry forward

democratic style in teaching, promote mutual trust between teachers and students, establish a friendship relationship, and then educate students, so that this friendship relationship can be transformed into a good teacher-student relationship. In this way, students can establish correct value orientation through psychological learning, and guide their own behavior, and lay a solid foundation for long-term development in the future.

In addition, establish positive teacher expectations. According to the Rosenthal effect, teachers' different expectations have a huge impact on students. In terms of the relationship between teachers and students, students who are highly expected by teachers show better adaptability, more vitality, and stronger thirst for knowledge. On the contrary, students with low expectations from teachers are not able to give full play to their potential [22, 23]. In the teaching of various subjects, students of different levels can participate in the activities according to the difficulty of tasks, so that they can feel the attention and expectation of teachers, and get a sense of achievement in the activities. Make students feel that teachers can treat every student equally, but also let students feel that they are an indispensable part of the collective, so that every student has a sense of belonging. This will naturally make the relationship between teachers and students closer, harmonious, and tacit understanding [24, 25].

All in all, by combining 3D video analysis method with educational psychology, the application of 3D video analysis method in practical teaching activities will not only help to establish a good teacher-student relationship but also help teachers to understand the psychological characteristics and learning process of students, thus greatly improving the quality of teaching.

2. Teacher Teaching Behavior Research Based on 3D Video Analysis

In this paper, in the verbal interaction between teachers and students, the system is divided into teachers' speech, students' speech and silence with three parts such as chaos, subdividing each part, teachers' words can be divided into indirect influence and direct impact, speech act is divided into students active, passive and discussing with fellow students, quiet and chaos into meaningful silence and quiet and confusion. In order to unify the coding standards and ensure the consistency of coding, this study conducted an in-depth analysis of the meaning and characteristics of each sub-code before formal coding, and explained each coding type according to the actual situation in class.

Teacher's acceptance of emotion: teacher's speech is to accept and understand students' emotion, attitude, and point of view. For example, the teacher said in class, "These two students simulated this process very accurately, with very accurate language and words," "I think your idea is novel," and "very good, scientist's idea".

Teacher praise or encourage: teachers praise and affirm students' words and deeds in class, or inspire students when they encounter problems. This code is subjective to the

teacher. For example, a student has been speaking actively in class, other students should learn from him.

The teacher adopts, corrects, or supplements the student's point of view: after asking questions, the teacher adopts the student's statement or supplements or corrects the student's point of view. For example, the teacher repeats the student's answer to the class, or the teacher supplements the student's answer and passes it on to the class.

Teachers' questions can be divided into two situations. One is open questions raised by teachers, that is, there is no standard answer to the questions raised by teachers, and students can express their opinions freely without limitation of scope. This kind of questions can train students' divergent thinking.

The non-verbal behavior coding system of teachers and students designed in this study is composed of two categories: teachers' classroom non-verbal behavior and students' classroom non-verbal behavior. The forms of teachers' nonverbal behavior in class can be divided into symbolic action, illustrative action, demonstrative action, instrumental action, adaptive action, accommodative action, and distance action. However, this study only counted non-verbal behaviors with positive significance in classroom teaching, so adaptive actions and regulatory actions were eliminated. For example, teachers can carry out situational teaching mode. After watching the video, teachers can guide students to combine their own experience.

On the basis of the coding system of MOOCs teaching video analysis, a preliminary analysis is made based on the questionnaire survey results. The following studies teachers' teaching behaviors in MOOCs teaching videos from the aspects of reliability and validity analysis, descriptive and difference analysis, attribute classification analysis, and Better-Worse coefficient analysis.

Reliability analysis is used to study the reliability and accuracy of the answers to quantitative data. If the coefficient k satisfies formula (1)–(3), respectively, it indicates that the questionnaire has a high reliability level, which is acceptable and untrustworthy.

$$k > 0.8, \quad \text{Highly reliable}, \quad (1)$$

$$0.6 < k < 0.8, \quad \text{Reliable}, \quad (2)$$

$$k \leq 0.6, \quad \text{Not reliable}. \quad (3)$$

Berg proposed that when the frequency difference between the highest and second-highest attributes in a behavior I is less than or equal to 5%, it can be classified by the value of user recognition coefficient. In other words, when S_i meets the following equations, the behavior is, respectively, attributed to the charm attribute (A), the expectation attribute (O), and the necessary attribute (M).

$$S_i > 1.1, \quad (A),$$

$$0.9 < S_i < 1.1, \quad (O), \quad (4)$$

$$S_i < 0.9, \quad (M).$$

The calculation formula of the relative recognition coefficient of users is

$$S_i = \frac{A_i + O_i}{O_i + M_i} \quad (5)$$

After classifying the attributes of the functions, we use the Better-Worse coefficient to analyze the influence of teachers' teaching behaviors on learners' perception in MOOC teaching videos. Better is the satisfaction coefficient after the increase, and its value is usually positive. The higher the value, the faster the learners' recognition will improve. Worse is the dissatisfaction coefficient after the elimination, and its value is usually negative. The lower the value, the faster the learners' recognition will decline.

$$\begin{aligned} \text{Better} &= \frac{A + O}{A + O + M + I}, \\ \text{Worse} &= -1 * \frac{O + M}{A + O + M + I}. \end{aligned} \quad (6)$$

Correlation analysis was used to study the correlation among the six dimensions of teacher teaching, classroom content, teacher-student interaction, vitality, dedication, and concentration in learner emotion. Pearson's correlation coefficient can represent the strength of the correlation relationship. When Pearson's correlation coefficient R , respectively, meets the following formula, the corresponding correlation is low correlation, medium correlation, and high correlation, respectively.

$$\begin{aligned} r < 0.4, & \quad \text{Low correlation,} \\ 0.4 \leq r \leq 0.7, & \quad \text{Medium correlation,} \\ r > 0.7, & \quad \text{High correlation.} \end{aligned} \quad (7)$$

3. Educational Psychology Teaching Based on 3D Video Analysis

3 D video analysis is the most important step in encoding, how the objective and accurate video coding is the most crucial step in this study, after the video quality of longed for class teaching lesson video coding repeatedly, summed up the following need to be aware of specific issues: first, the coding of the smallest unit is a word or an action, such as a problem or a nod. If a sentence or an action contains the corresponding meanings of multiple codes, these multiple meanings should be coded separately. For example, when students answer questions, the teacher continues to ask questions, both of them should be coded. Second, be familiar with the code and the corresponding meaning of the code, so that you can code the fragment in your mind without looking at the code table. Third, be familiar with the "excellent lesson" video of selection coding, watch these six teaching videos repeatedly, and memorize the interactive content between teachers and students in the teaching videos. Fourth, in order to avoid mistakes in the coding process, the researcher asked his friends to help encode the video of "Youke" for two times, respectively. When it was not easy to determine the attribution of the video, the two of them discussed before coding. Fifth, this study only codes the video clips with clear representation and meaning,

mainly reflected in the process of encoding the nonverbal behaviors of teachers and students, and only codes the nonverbal behaviors that can be clearly observed in the video. Teachers deduce it in the form of groups in class, from different role playing and character perspective, to deeply understand the content of psychological teaching, and clear the importance of mental health.

In order to transmit teaching information more effectively, no matter there are learners or not in MOOCs teaching videos, teachers must simulate the teaching state of traditional classroom, whose teaching essence and core remain unchanged. Therefore, this study believes that teachers' teaching behaviors in MOOCs teaching videos can be quantified through coding.

Modern semiotics has broken the shackles of semiotic language range in the old times and divided signs into verbal signs and non-verbal signs according to the way of communication. In the sense of semiotics, teachers' teaching behavior refers to the process of information exchange and sharing by using symbols. Based on the above analysis, this study preliminarily classifies observable behavior into two dimensions: "teacher's speech behavior and teacher's non-speech behavior."

Teacher's speech act is the main dissemination type of teaching information in teaching process. Based on the analysis of existing literature and typical interactive analysis coding system, some codes and expressions suitable for MOOCs teachers' speech acts are selected and collected, and the codes and expressions are adjusted and modified in combination with the characteristics of MOOCs teaching videos. Teacher's non-verbal behavior refers to the media behavior and facial expression behavior aimed at communication or information transmission in the teaching process. At present, there is no coding system for teachers' non-verbal behaviors, and the classification of teachers' non-verbal behaviors is also unified. From the perspective of functions, Cooper divides non-verbal functions into six categories: self-display, rules and regulations implementation, response and emphasis, indicating attitude to school rules and regulations and curriculum and influencing learners, controlling and guiding classroom dialogue, and controlling the classroom. Chen minghua divides teachers' non-verbal behaviors into three types: easy, intuitive, and suggestive. From the form of expression, Yang Ping classifies it succinctly into: close body language, body language, and paralanguage; Boyd believes that teachers' non-verbal behaviors are manifested in seven forms: kinesiology, nearness, haptics, ophthalmology, linguistics, environmental factors, and facial expressions.

From the perspective of learner emotion as model construction, this paper designs teacher's speech act and teacher's non-speech act, respectively, and constructs teacher's teaching behavior model in MOOCs teaching video according to the priority of learner perception on teacher's teaching behavior. And teachers on the premise of their own attention, invest more time and energy, and finally realize their own comprehensive development.

In the MOOCs video analysis and coding system constructed in this paper, teachers' teaching behavior is divided

into two dimensions: teacher's speech behavior and teacher's non-speech behavior. Through the research, it is found that Chinese MOOCs teachers do not have strong awareness of the use of non-speech behavior, and it is relatively random. The non-standard use and abuse of non-verbal behaviors will lead to bad teaching effects such as learners' inability to understand teachers' ideas or distraction of attention. Teachers should reflect on this and improve it in time, strengthen the awareness of active learning of non-verbal behavior, and find a more appropriate form of expression of non-verbal behavior. In view of this, the author puts forward the following two improvement strategies.

3.1. Improve the Awareness of Non-Verbal Behavior Use. MOOC teachers in China attach great importance to their speech acts. They will carefully design each teaching link and main speech acts before class, but often ignore the design and use of non-verbal acts. Obviously, when teachers' verbal and non-verbal behaviors complement each other, good teaching effects will be achieved. Therefore, it is very necessary to pay attention to the use of non-verbal behavior, which should become an important part of the improvement of teachers' teaching behavior ability. In order to improve the teaching effect of MOOCs, teachers should fundamentally change their ideas and improve their awareness of the use of non-verbal behaviors.

3.2. Regulate Non-Verbal Behavior. At the national level, a set of standard guidelines for the use of teachers' nonverbal behaviors can be put forward to regulate the performance of teachers' nonverbal behaviors in MOOCs teaching videos. From the government level, systematic training can be conducted on the use of nonverbal behaviors of teachers in MOOCs teaching videos. From the personal level of teachers, the first way is to learn the experience of using non-verbal behaviors from teachers with rich teaching experience. Excellent teachers with rich teaching experience are more natural and appropriate in the expression of non-verbal behaviors.

The second way is to communicate with learners, understand their opinions, and combine the use of nonverbal behaviors with learners' perception. The third way is to watch excellent MOOCs cases, especially popular MOOCs, in which teachers' non-verbal behaviors are relatively mature and standardized.

According to the classification and priority order of teachers' teaching behaviors in MOOC teaching videos perceived by learners, the author proposes improvement strategies from three aspects: essential attribute, expectation attribute, and charm attribute.

3.2.1. Essential Attributes. First, the comprehensive use of a variety of teaching methods. Non-national quality MOOC teachers are mainly lecturing, and ask fewer questions in the whole teaching process. In the long run, learners' abilities of active exploration and independent thinking will be weakened. However, high-quality MOOCs teachers at home and

abroad or from other countries focus on heuristic teaching, helping learners to create "zone of recent development" and guiding learners to think through progressive and in-depth questioning. Combined with the basic situation of education in China, MOOC education in China should be an organic combination of "teaching" and "inspiration." The two are indispensable, which should not only impart knowledge but also guide digestion and absorption. Only when the two promote each other can the teaching quality be effectively improved.

Second, use the way of "teacher-medium combination" to assist teaching. MOOCs teachers can intentionally combine themselves with simplified teaching media to form a unified whole of "teacher-media combination," so as to cause learners' behavior of changing viewpoints between teachers and media, avoid visual fatigue, and enhance learners' "stickiness" in using MOOCs.

Third, comprehensive use of a variety of teaching media. It is particularly common for teachers to use single teaching media in MOOCs teaching videos, which is not easy to attract learners' attention for a long time, and learners' enthusiasm in learning involvement or participation will gradually decline. In essence, no single media can perfectly support all the teaching content. According to different teaching strategies and teaching objectives, teaching content also has different needs for teaching media. In MOOCs teaching videos, teachers should enrich the use of other media so as to increase the teaching vitality. However, it should be noted that the diversified use of teaching media in MOOCs teaching videos does not mean that the more media types, the better. The purpose of the course, the ability of teachers to manipulate, and the ability of learners to accept should be considered comprehensively, and all kinds of teaching media should be properly used.

3.2.2. Expectation Attribute. Different body movements have different functions, and Mark believes that placing hands near the navel better expresses the true feeling of the intention, while placing hands near the chest better expresses the excitement of the intention. On the one hand, teachers should deliberately learn the meaning and role of different sign language or body language, and correctly use body movement to assist teaching. On the other hand, teachers can improve the effectiveness of body movements through training. Online reflection, summary, and redesign of body movements are performed through video analysis. Offline through repeated training, the muscles form a mechanized memory and the brain's subconscious response. Of course, teachers should also follow a number of principles to ensure the correct use of video, so as to maximize its role and contribute to the improvement of teaching quality.

3.2.3. Charm Attribute. In the process of communication between teachers and students, teachers' charismatic behavior can alleviate the problems of online learners' burnout and bad learning emotions, and promote learners' deep learning. In order to strengthen teachers' emotional support, improve teachers' teaching affinity and enhance learners'

involvement, MOOC teachers in China should improve their emotional expression ability from the following two aspects.

First of all, it is necessary to sublimate teachers' professional emotion and maintain positive emotional state. After teachers touch the true meaning of education and their own responsibility and mission, they will unconsciously have a favorable impression on education, gather more sense of responsibility and value, and form a positive teacher professional emotion. In the recording process of MOOCs teaching videos, teachers should always maintain their own positive emotional state and create a positive and happy emotional state. At this time, teachers' emotional support, as a kind of implicit teaching behavior, is kept in the teachers themselves. However, in the application of actual teaching, teachers should combine with the actual situation of students, and deeply analyze the reasons that hinder the efficient development of psychology, in order to be able to use videos pertinently, strengthen the psychological construction of students, and promote the healthy development of students.

Second, reasonable expression of their emotional support. On the one hand, the teacher's emotional expression should accord with the teacher's role identity and the identity of the teacher's expression object; on the other hand, it should be combined with the teaching content for rational expression, so as to be touching and decent. In MOOCs teaching videos, teachers should express them through charming behaviors according to the educational objectives, educational situations, and educational needs, so as to create a warmer teaching environment, make learners feel positive, have a happy learning experience, and meet their emotional needs.

In order to conduct data analysis on the whole course, data selection and analysis were conducted for basic problems and teaching activities before the course. Fifteen students, 15 students, and 20 students from three classes were selected as the research objects. The results are shown in Figure 2. 48% of them reported frequent use of video teaching resources in their daily courses. Besides, the percentage preference for different educational tools is shown in Figure 3.

The number of lines of code of a course is shown in Figure 4. The "lines of code" chart of the whole level-1 code mainly presents the distribution information of "teacher's speech," "student's speech," and "silence and chaos" in the class example visually.

From the horizontal perspective of "teacher's speech," the green coded bar in the first line represents the verbal interaction between teachers and students as "teacher's speech." As can be seen from the figure, teacher's speech runs through the whole class with a relatively large frequency and takes a long time, reflecting the leading role of teachers in the class.

From the horizontal perspective of "students' speech," the yellow code bar in the second line represents the verbal interaction between teachers and students as "students' speech." As can be seen from the figure, "students' speech" is widely distributed, which reflects that teachers pay attention

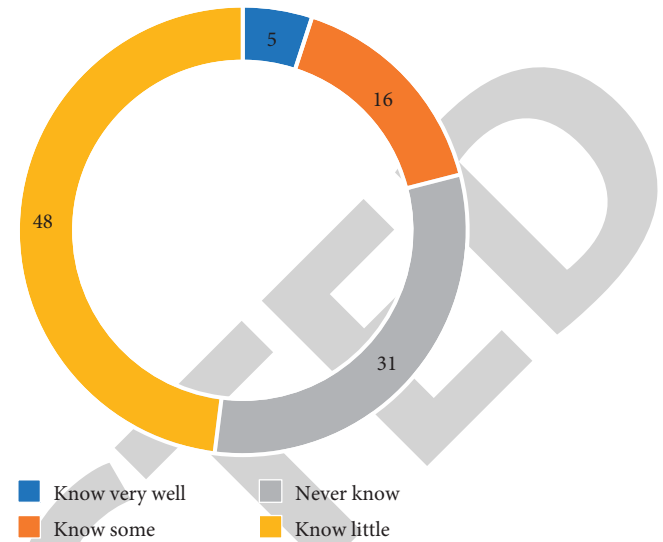


FIGURE 2: The cognition of video teaching resources.

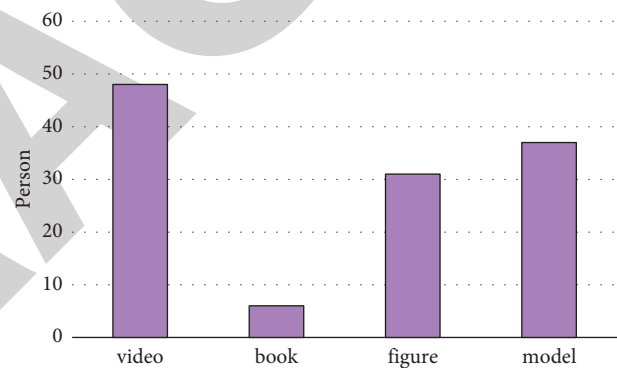


FIGURE 3: Percentage preferences for different educational tools.

to students' subjectivity and give students sufficient time and opportunities to express themselves.

From crosswise "quiet and chaos" in the classroom, the third line of blue article code on behalf of the verbal interaction between teachers and students is a "quiet and chaos," "quiet and chaos" of this study mainly refers to students' thinking time, doing homework or watching video, meaningless pause, etc., can be seen from the figure in the "quiet and chaos" of the frequency and time is more, it shows that students have more time to think. The normalized frequency is shown in Figure 5.

Figure 6 shows the frequency of classroom teaching behaviors. It can be seen that in the classroom, the largest proportion of classroom teaching behaviors is giving guidance or instruction (Code 6), followed by teachers asking questions (Code 4) and students actively responding (Code 11). Praise and encouragement (Code 2), acceptance or use of students' opinions (Code 3), teacher's explanation (Code 5), and students' passive response (Code 10) also account for a certain proportion. Accept and positive emotions (code 1), with the help of the media, or AIDS (8) code of practice, interaction, promote or emphasized

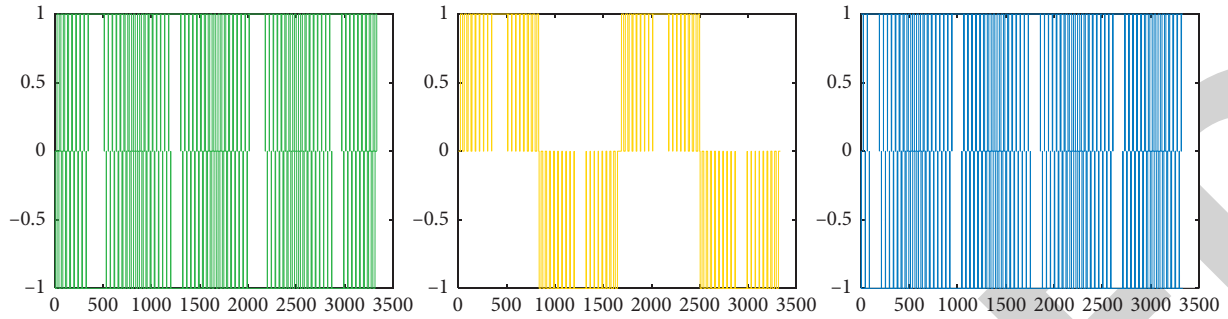


FIGURE 4: The number of lines of code of a course.

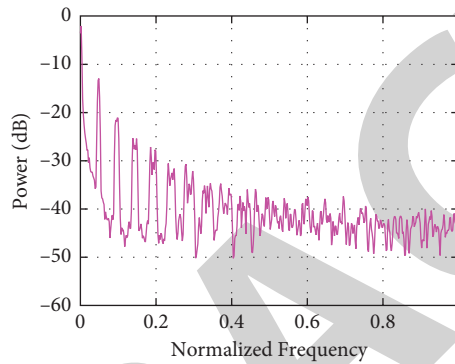


FIGURE 5: The normalized frequency.



FIGURE 6: Proportion of classroom teaching behavior frequency.

students (9) coding, speech or presentation (12) coding, student collaboration (13) coding, students' use of education resources (14) coding, students practice or create works (15) coding, students thinking (encoding 16). These kinds of teaching behaviors appear less frequently in this lesson; criticism or maintenance of authority (Code 7) and confusion or unhelpful silence (Code 17) are almost absent in this lesson. According to data analysis and coding information analysis, teachers in this class mainly issue

instructions and guidance to students, teach knowledge by asking questions and answering students, and help students better understand knowledge and form knowledge framework by combining teachers' explanation and summarization of knowledge points. The prediction is also shown in Figure 7. The application of 3D video is an important breakthrough in secondary vocational psychology teaching, which breaks the rigid dogma of traditional teaching and injects new vitality into the classroom.

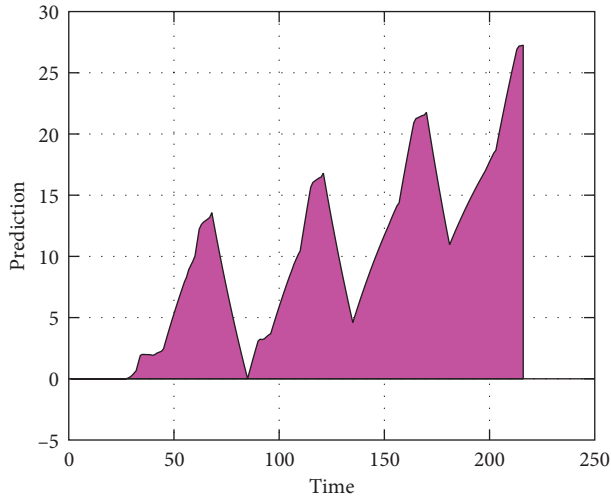


FIGURE 7: The prediction.

4. Conclusion

In this paper, 3D video analysis method is taken as the basic research method. Compared with other classroom research methods, video analysis method has more comprehensive research data, and video analysis method can record the classroom teacher-student interaction process more completely through sound and images. In the process of data statistics, video analysis software can be used, or classroom teaching videos can be repeatedly played, so that the data obtained is more objective and comprehensive, and the influence of human subjective factors can be avoided to the greatest extent. In addition, the research efficiency of video analysis method is high, which breaks through the limitation of research time and place. Video analysis software is used to process and analyze classroom videos, which reduces the time and energy consumption of researchers and improves the research efficiency.

Data Availability

The dataset can be accessed upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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