Research Journal of Education
ISSN(e): 2413-0540, ISSN(p): 2413-8886
Vol. 9, Issue. 3, pp: 23-40, 2023
URL: https://arpgweb.com/journal/journal/15
DOI: https://doi.org/10.32861/rje.23.40

Academic Research Publishing Group

Original Research Open Access

The Application Status, Principles and Strategies of Situation Creation in High School Biology

Bo Peng
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Zhuanqing Yang
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Yongjie Yang
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Piaopiao Sun
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Yanfang Sun
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Xuezhong Sun
Henan Xinyang Senior High School, Xinyang, Henan, China

Ruihua Pang
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Wei Zhou
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China

Quanxiu Wang (Corresponding Author)
College of Life Sciences, Xinyang Normal University, Xinyang, Henan, China
Email: wwqqxx08@163.com

Article History
Received: 2 May, 2023
Revised: 15 July, 2023
Accepted: 18 August, 2023
Published: 23 August, 2023

Abstract

The "General High School Biology Curriculum Standards (2017 Edition, 2020 Revision)" requires teachers to learn to use real-life materials for teaching, to present the curriculum content in a situational manner, and to lay a solid foundation for students' lifelong development. By investigating the current application of scenario creation in high school biology classroom teaching, it was found that teachers have a one-sided understanding of scenario creation and there are misconceptions in their teaching use. Students' learning methods are not flexible enough, their autonomous learning ability is weak, and classroom learning efficiency is low. Therefore, teachers should follow the principles of objectivity, authenticity, emotion, and development when creating situations. Teachers can use pictures, videos, life phenomena, explore practice, and create scenarios through research cases. This article analyzes the current application status of scenario creation and develops a set of principles and strategies for scenario creation, which can provide reference and inspiration for biology teachers in frontline high schools.

Keywords: High school biology; Classroom teaching; Scenario creation.

1. Introduction

High school biology is a fundamental natural discipline related to life education, ecological issues, and more. Compared with junior high school biology, the concept learning of senior high school biology is more abstract, and knowledge is closely related to real life, posing higher requirements for students' knowledge reserves and the development of higher-order thinking (Zhou *et al.*, 2022). The Ministry of Education of the People's Republic of China issued the "New Curriculum Standards for High School Biology (2017 Edition and 2020 Revision)" in June 2020, abbreviated as the "New Curriculum Standards".

The new curriculum standards require students to reflect their knowledge, abilities, emotional attitudes, and values in solving practical problems in real situations. Teachers need to change their concepts and behaviors, learn new teaching models, guide students to actively participate in classroom learning activities, and deepen their understanding of knowledge and expand their thinking from learning experiences. Teachers should learn to use real-life materials for teaching and present the course content in a contextualized manner. By carefully designing classroom teaching processes and activities, learners can understand biological knowledge in real-life situations, assist them in establishing connections with daily life, guide them to deeply understand biological knowledge, explain life phenomena, and stimulate students' strong interest in biology in the process of answering real-life

questions. The new curriculum standards repeatedly emphasize the word "situation", where teachers teach in situations and students learn in situations, reflecting the necessity of creating situations. The Central Committee of the Communist Party of China and the State Council have also explicitly stated in a document issued: "Integrating the use of traditional and modern technological means, and emphasizing situational teaching (Ministry of education, 2019). By creating situations that students can easily accept in the classroom, students can understand and comprehend the knowledge they have learned, thereby generating emotional experiences and activating their thinking.

2. The Connotation of Context

Dewey was the first to introduce "context" into educational research. "Situation" is an important concept in Dewey's pragmatism philosophy, which is usually closely related to another important concept "experience". He believes that "any normal experience is the interaction between objective and internal conditions, and when the two are combined or in their interaction, they form what we call a situation" (Jiang, 2005). The acquisition of any experience cannot be separated from the context in which it occurs , and it is emphasized that context is a process of interaction between humans and the natural environment, which is not only the experience itself but also the background of the experience (Liu, 2021; Zhao, 2010). Based on this, the essence of a situation can be understood from two aspects. Firstly, context means interaction, which is the embodiment of human participation and can generate direct experiences, otherwise it cannot be called context. For the learning context, this embodied direct experience must also be related to learning. Secondly, as a field of learning, situations are fluid and changing (Yu, 2023). This indicates that the generation of situations requires human participation, and human experience and thinking are constantly changing, and situations are also constantly emerging.

Teacher Li Jilin is the founder of situational education and opposes confusing context with environment. She believes that the essence of a situation is "artificially optimizing the environment", which is a teaching scenario that can resonate with children's emotions, stimulate their potential, and promote their comprehensive development. It is a living space with educational connotations and a psychological place for multi-dimensional interaction (Wang, 2020). Teacher Tao Xiping also advocates distinguishing between context and environment, as context is a more specific emotional experience of the outside world compared to the environment. This view has something in common with Teacher Li Jilin, both emphasizing the generation of emotions.

3. Survey on the Current Situation of Scenario Creation Applications

The new curriculum standards advocate for teachers to change their teaching methods and create appropriate contexts for teaching. By distributing survey questionnaires to teachers and conducting interviews with some teachers, the current application of scenario creation in high school biology classroom teaching was investigated, and existing problems were identified and solutions were proposed.

3.1. Purpose of the Investigation

On the one hand, this survey aims to understand the cognition and application of scenario creation among high school biology teachers through teacher questionnaires. Through teacher interviews, gain a deeper understanding of high school biology teachers' views on scenario creation, the difficulties they encounter, and the help they hope to receive. On the other hand, by using student questionnaires to understand the current classroom situation of students learning biology knowledge, we further identify the problems of scenario creation in high school biology classroom teaching.

3.2. Survey Subjects

The school selected for this survey is Luanchuan County No.1 Senior High School. This school is the first demonstrative characteristic high school in Luoyang City and one of the first batch of diversified development demonstration schools for high schools in Henan Province. In the past decade, the school has promoted distinctive and diversified school running from various aspects, such as enriching the curriculum system, strengthening the brand of curriculum reform, innovation management evaluation, etc., to meet the development needs of students at different levels, and implement the fundamental task of building morality and cultivating people.

The subjects of this teacher questionnaire survey are 28 biology teachers from the entire school, with 6 of them being interviewed. In terms of teaching experience, there are two teachers with a teaching experience of 3 years, one teacher with a teaching experience of 5 years, another two teachers with a teaching experience of 10 years, and the remaining teacher with a teaching experience of more than 10 years. In the teaching grade, there are two teachers in each of the first, second, and third years of high school. Overall, the six teachers interviewed are highly representative. After more than a year of learning, high school sophomore students have gained a general understanding of high school biology knowledge. Therefore, a total of 440 students from 8 classes in high school sophomore year were selected as the survey subjects.

3.3. Survey Questionnaire Design and Interview Design

The teacher survey questionnaire consists of 21 multiple-choice questions, of which 17 are single choice and 4 are multiple-choice (Table 2.1).

Table-2.1. Design of teacher survey questionnaire

Survey content	Question number
Basic information of teachers	1、2、3、4
Teacher's Cognition of Situation Creation	5、6、7
The application of teacher's situational creation	8、9、10、11、12、13、14、15、16、17
Teacher's Attitude towards Teaching Application Scenario Creation	18、19、20、21

There are a total of 10 multiple-choice questions in the student survey questionnaire, all of which are single choice questions (Table 2.2).

Table-2.2. Design of Student Survey Questionnaire

Survey content	Question number
Students' interest in biology	1、2
Student Learning Methods in Biology	3、4
Student Performance in Biology Classroom	5、6、7
The application of biology knowledge by students after class	8、9、10

A total of 4 questions were designed for teacher interviews (Tables 2.3).

Table-2.3. Teacher Interview Design

Interview content	Question number
May I ask for your opinion on scenario creation	1
Could you please talk about the types of scenarios you have created and their classroom effects	2
Could you please talk about the difficulties encountered in scenario creation	3
Could you please talk about the help you would like to receive when creating a scenario	4

3.4. Investigation Implementation

The survey questionnaire was sent in paper form to teachers and students, and teacher interviews were recorded face-to-face. A total of 28 teacher survey questionnaires were distributed, 28 were collected, and 28 were valid. A total of 440 student survey questionnaires were distributed, 436 were collected, and 430 were valid (Table 2.4). The six teachers interviewed carefully and truthfully communicated and answered the interview content.

Table-2.4. Distribution and Recovery of Survey Questionnaire

Distribution target:	Number of copies distributed	Recycled copies	rate of recovery	Number of valid questionnaires	Effective recovery rate
teacher	28	28	100%	28	100%
student	440	436	99.1%	430	98.6%

3.5. Teacher Questionnaire Survey Results and Analysis

(1) Basic information of teachers

Questions 1-4 provide basic information about teachers (Table 2.5). Among the biology teachers surveyed in this survey, male teachers accounted for 17.9%, and female teachers accounted for 82.1%. This shows that there are more boys and girls, and the gender ratio is seriously unbalanced, which is consistent with the fact that there are fewer and fewer male teachers engaged in the teaching industry in today's society. 46.6% of teachers have less than 5 years of teaching experience, 21.4% have 5-10 years of teaching experience, 28.6% have 10-20 years of teaching experience, and 3.4% have over 20 years of teaching experience. Nearly half of the teachers in this school have been teaching for less than 5 years, and the main force of the school is mainly young teachers. Young teachers, who have just started working in the teaching industry are full of vitality and enthusiasm. They prefer to try and innovate their teaching methods. The proportion of teachers in the first and third grades of high school is 32.1%, while the proportion in the second grade is 35.7%. Overall, the distribution of teachers in each grade is relatively balanced. 71.4% of teachers have a bachelor's degree, while 28.6% have a master's degree, indicating that the school has a strong teaching staff.

Table-2.5. Basic Information of Teachers

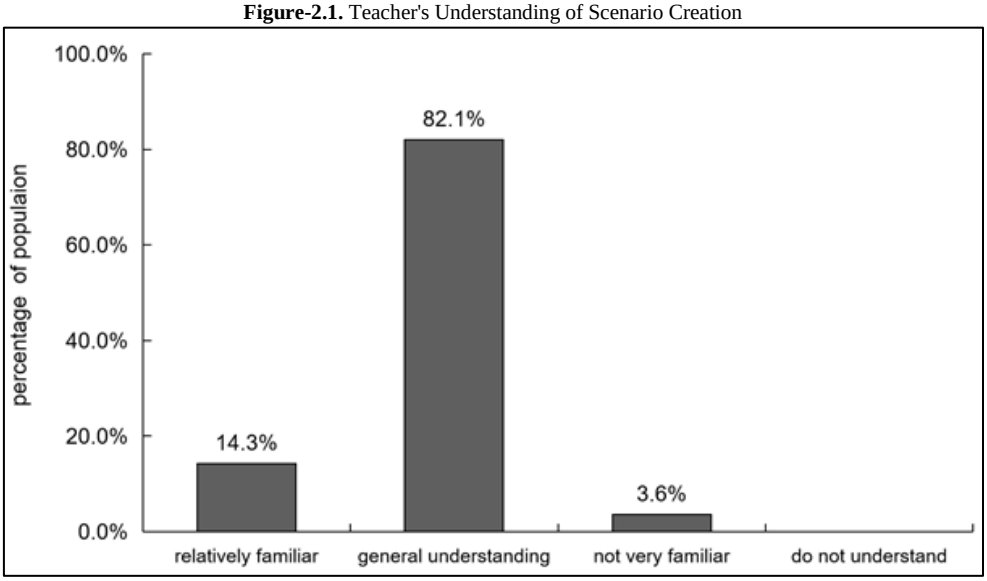
type	option	quantity	percentage
Gender	male	5	17.9%
	female	23	82.1%
Teaching experience	Less than 5 years	13	46.6%
	5-10 years	6	21.4%
	10-20 years	8	28.6%
	Over 20 years	1	3.4%
Teaching grade	Senior One	9	32.1%
	Senior 2	10	35.7%
	third year in high school	9	32.1%
education	undergraduate	20	71.4%
	Master's degree	8	28.6%

(2) Teacher's Cognition of Situation Creation

The fifth question is to investigate the teacher's understanding of scenario creation (Figure 2.1). 14.3% of teachers have a good understanding of scenario creation, 82.1% of teachers have a general understanding of scenario creation, 3.6% of teachers are not very familiar with scenario creation, and there are no teachers who are not familiar with scenario creation. Through data comparison, it was found that the majority of teachers have a general understanding of scenario creation. It is possible that these teachers have not conducted in-depth research and exploration of scenario creation, and their application in classroom teaching is not very proficient.

.

Figure-2.1. Teacher's Understanding of Scenario Creation



The sixth question is to investigate the ways in which teachers understand situational creation. This question is a multi choice topic (Figure 2.2). 71.4% of teachers learn about situational creation by reading articles or books, participating in extracurricular training, 78.6% of teachers learn about situational creation by listening to other teachers' discussions, 42.9% of teachers learn about situational creation by listening to expert lectures on campus, and 10.7% of teachers learn about it through other means. From a data perspective, the main ways for teachers to understand situational creation are through reading articles or books, listening to other teachers' discussions, and participating in extracurricular training. Reading articles and books, and listening to other teachers discussing these two ways, it is easy for teachers to pay more attention in their daily life and work. Participating in off campus training requires teachers to actively apply for places from the school, indicating that some teachers are still eager to learn more about scenario creation. The school can continue to contact some off campus training experts to provide more opportunities and convenience for teachers.

The seventh question is about investigating the sources of materials used by teachers to create situations, and it is also a multiple-choice question (Figure 2.3). 89.3% of teachers' materials for creating scenarios come from textbook content, while 92.9% of teachers' materials for creating scenarios come from pictures, videos, and real-life examples. Using these materials to create scenarios is not only closely related to the teaching content, but also can stimulate students' interest in learning, be close to life, and conform to students' cognition. 75.0% of teachers use social hotspots to create scenarios, which not only makes it easier for students to acquire knowledge, but also helps them understand social news and cultivate a sense of social responsibility. 53.6% of the teachers use the history of science to create situations. These teachers pay more attention to the changes of the new textbooks and the reform of the college entrance examination. history of science has gradually become the college entrance examination site. Teachers should attach importance to the relevant history of science when creating situations. Students can expand the spirit of scientific inquiry by understanding the experimental exploration process of scientists. Only 35.7% of

teachers use models to create scenarios, indicating that teachers overlook the help of models in teaching. Appropriate models can stereoscopize microscopic knowledge, such as the double spiral model of DNA, so that students can master the structure of DNA molecules in more detail.

Figure-2.2. Ways for Teachers to Understand Situation Creation

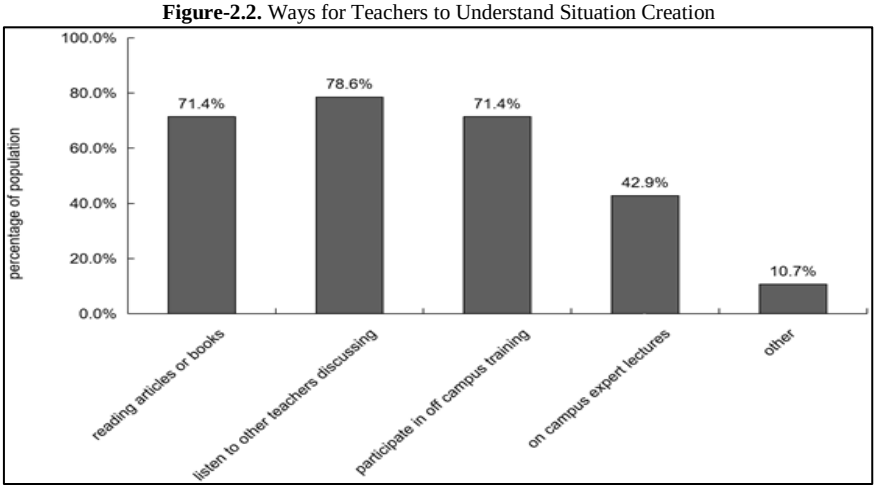
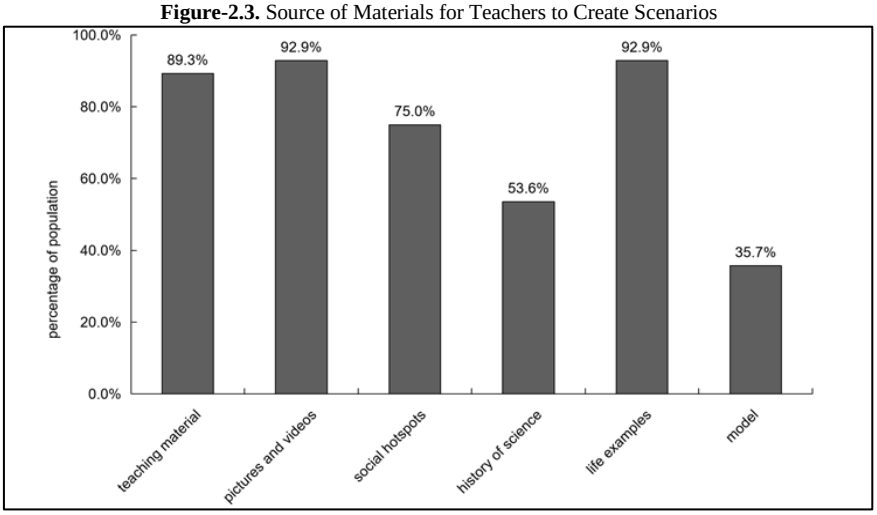


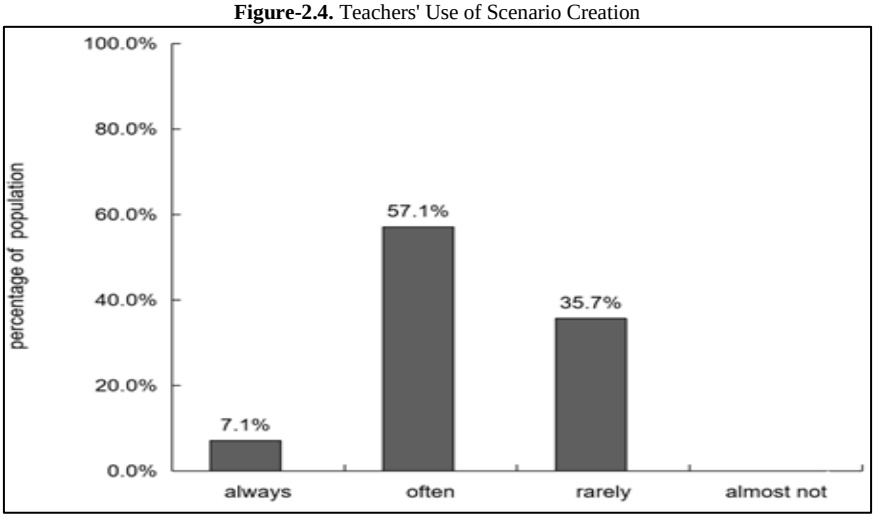
Figure-2.3. Source of Materials for Teachers to Create Scenarios



(3) The application of teacher's situational creation

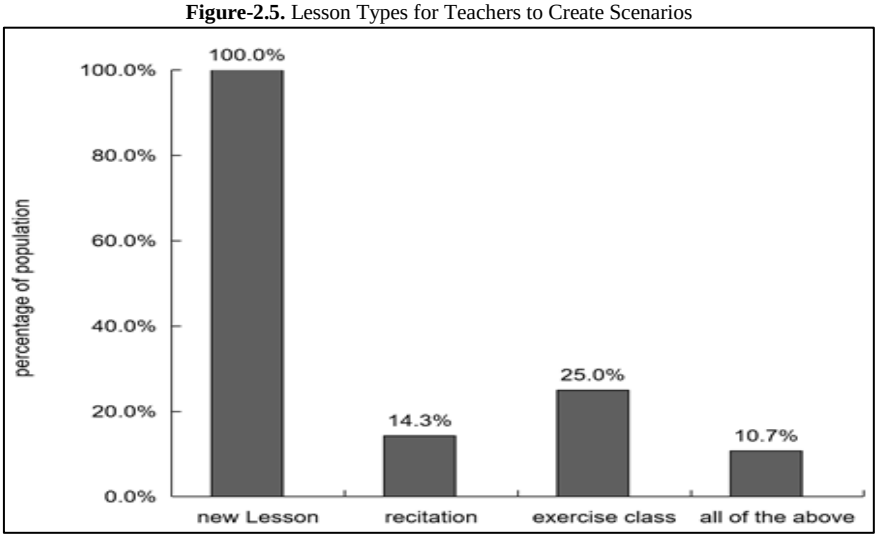
Question 8: Investigate whether teachers create situations in teaching (Figure 2.4). 7.1% of teachers always create situations for teaching in the classroom, 57.1% choose "frequently", and 35.7% rarely create situations for teaching in the classroom. From the perspective of data, there are also teachers who do not use scenario creation frequently, indicating that these teachers may still have some problems or difficulties when using scenario creation, which makes them unable to proficiently apply scenario creation in the classroom.

Figure-2.4. Teachers' Use of Scenario Creation



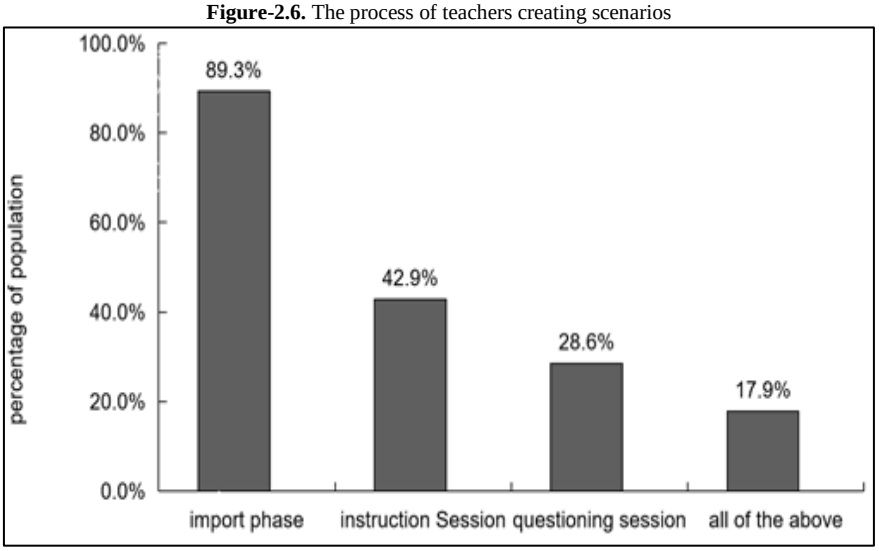
The 9th question is to investigate what type of lesson the teacher is creating in the context, which is a multi choice question (Figure 2.5). Teachers tend to create situations in new teaching. 14.3% of teachers choose to create situations in review classes, 25.0% choose to create situations in evaluation classes, and 10.7% of teachers will create situations in all three types of classes. Explain that teachers are good at using situational creation to impart new knowledge to students, facilitating their deep understanding of knowledge. However, teachers create relatively few situations in review and evaluation classes, which needs to be taken seriously. Regardless of the class type, teachers should create appropriate contexts based on the learning content, which will greatly help students' understanding and memory, knowledge review, and problem-solving effects.

Figure-2.5. Lesson Types for Teachers to Create Scenarios



The 10th question is to investigate where the teacher created the situation, which is a multi topic question (Figure 2.6). From this perspective, most teachers' use of situational creation is not thorough enough and is mostly limited to the classroom introduction process. As an effective teaching method, situational creation needs to be proficiently mastered and applied by teachers in various teaching stages.

Figure-2.6. The process of teachers creating scenarios



The 11th question is to investigate whether the situation created by the teacher is real (Figure 2.7). 25.0% of the situations created by teachers are basically real, while 21.4% of the situations created by teachers are only partially real. Other teachers rarely consider the authenticity of the situations they create. False situations can lead to cognitive errors among students and do not meet the requirements of the new curriculum standards of "teachers should conduct teaching and evaluation in real situations".

Figure-2.7. Situation of Teachers Creating Real Scenarios

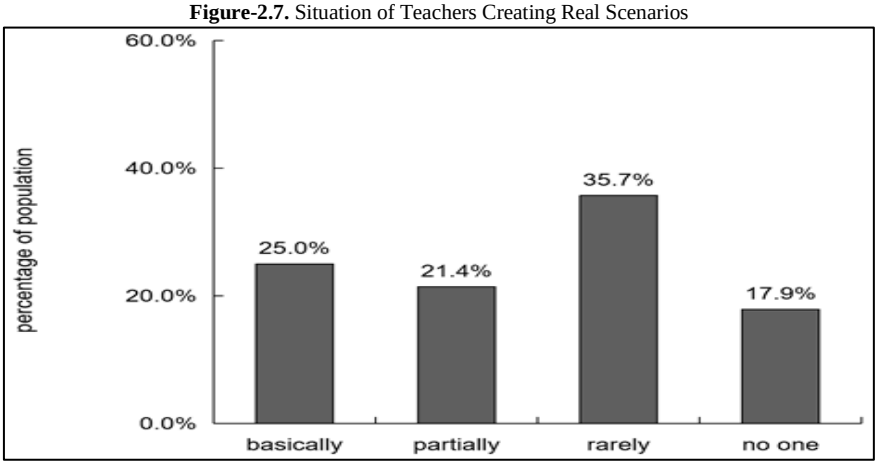
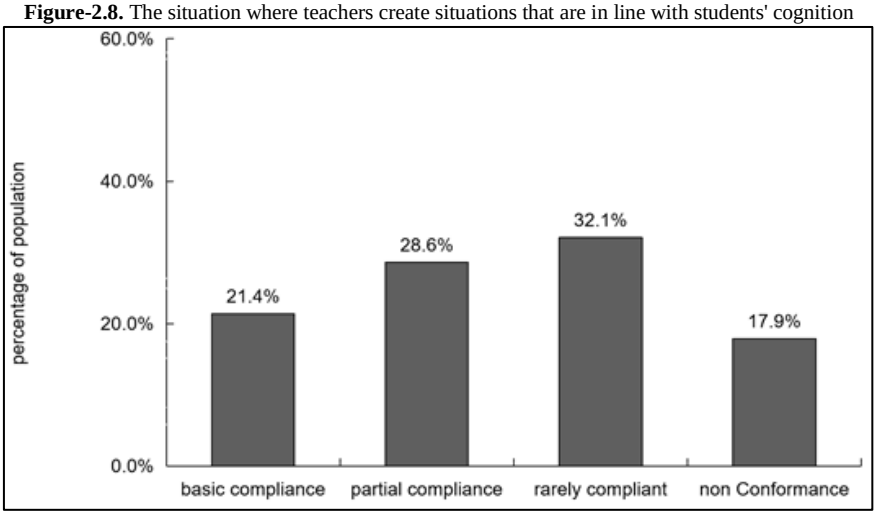
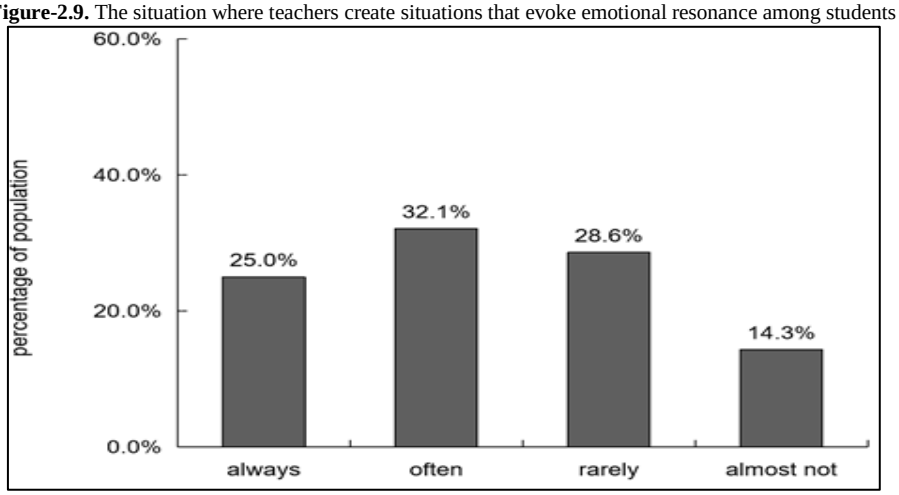


Figure-2.8. The situation where teachers create situations that are in line with students' cognition



Question 13 is to investigate whether the situations created by teachers can evoke emotional resonance among students (Figure 2.9). 25.0% of teachers create situations that always resonate with students' emotions, while 32.1% of teachers often create situations that resonate with students' emotions. 28.6% of teachers chose "rarely" and 14.3% chose "almost impossible". Some teachers overlook the emotional experience and changes of students' learning process when creating scenarios. But the situations created by teachers need to enable students to emotionally integrate into the classroom, so that students can truly put classroom knowledge into their minds. Therefore, the created situations must evoke emotional resonance among students.

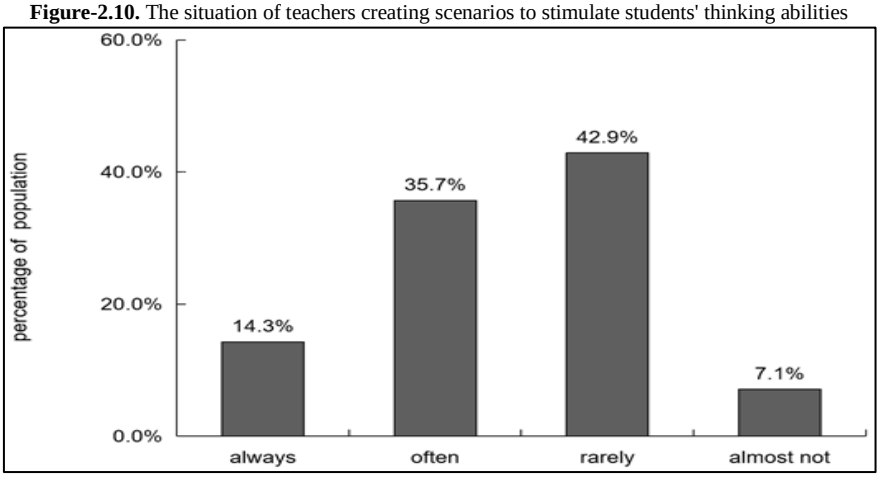
Figure-2.9. The situation where teachers create situations that evoke emotional resonance among students



Question 14 is to investigate whether the situations created by teachers can stimulate students' thinking abilities (Figure 2.10). 14.3% of teachers believe that the situations they create always stimulate students' thinking abilities, 35.7% of teachers believe that the situations they create often stimulate students' thinking abilities, 42.9% of teachers choose "rarely", and 7.1% of teachers choose "almost not". Explain that some teachers are unable to stimulate students' thinking abilities when creating scenarios. During the teaching process, teachers should pay attention to the

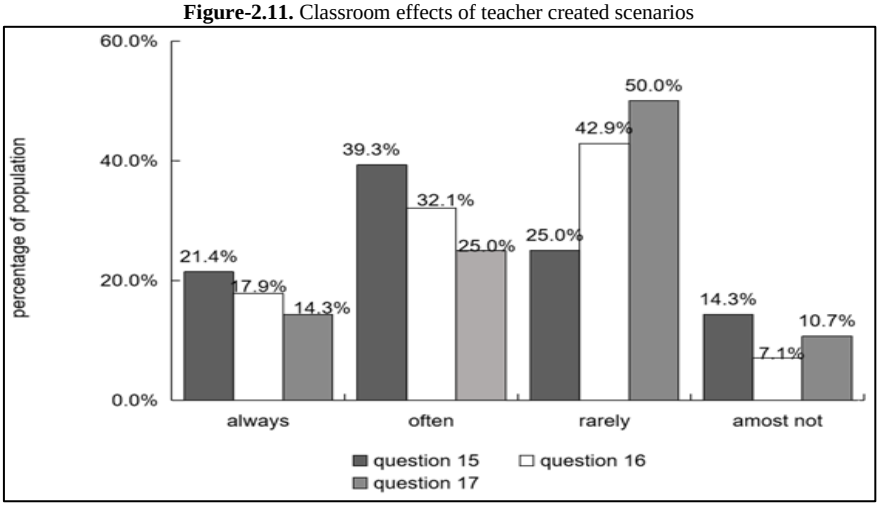
expansion of students' thinking abilities, encourage them to use their brains and think more, improve their ability to discover and solve problems, cultivate their scientific thinking, and implement their core biological literacy.

Figure-2.10. The situation of teachers creating scenarios to stimulate students' thinking abilities



Questions 15-17 investigate the classroom effect of teacher created scenarios (Figure 2.11). In terms of students' interest in classroom learning, 25.0% of teachers stated that creating scenarios rarely stimulates students' interest in learning. 14.3% of teachers chose 'almost impossible'; In terms of students' confidence in learning biology knowledge; 17.9% of teachers believe that creating scenarios always enhances students' confidence in learning biology knowledge, 42.9% of teachers believe that creating scenarios rarely improves students' confidence in learning biology knowledge, and 7.1% of teachers choose "almost impossible". In terms of classroom teaching atmosphere, only 14.3% of teachers believe that scenario creation can help them form a good teaching atmosphere, 25.0% of teachers choose "frequently", 50.0% of teachers believe that creating scenarios rarely creates a good teaching atmosphere, and even 10.7% of teachers choose "almost never". The above data indicates that some teachers have certain problems in creating scenarios, which may be due to the unreasonable selection of situational materials, outdated materials, and detachment from teaching objectives, resulting in students not being interested, low classroom learning atmosphere, and unsatisfactory classroom effects.

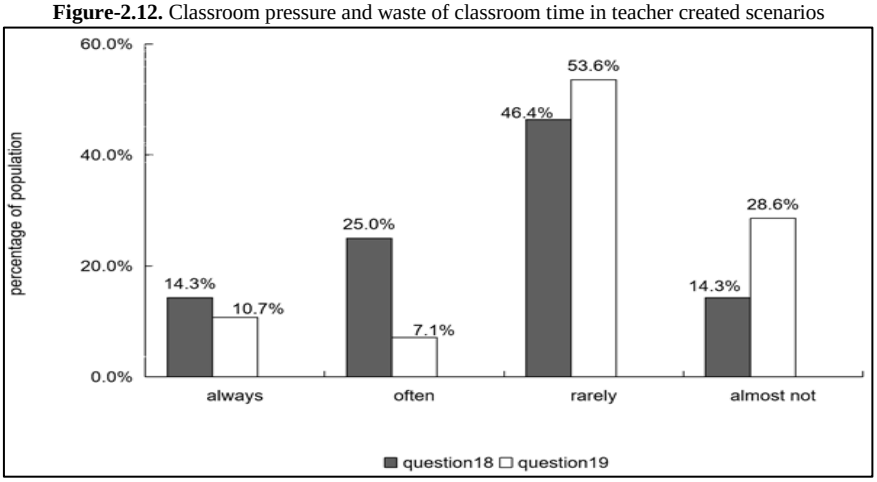
Figure-2.11. Classroom effects of teacher created scenarios



(4) Teacher's Attitude towards Teaching Application Scenario Creation

The 18th and 19th questions are to investigate whether creating a scenario will bring pressure to teachers in lesson preparation and waste classroom time (Figure 2.12). 14.3% of teachers believe that creating scenarios always puts pressure on them to prepare for classes. 25.0% of teachers chose 'frequent meetings'. 17.0% of teachers believe that creating situations will waste classroom time, with 10.7% of teachers believing that it always wastes classroom time, which is consistent with the results of some teachers rarely creating situations in the classroom in question 8. Explain that lesson preparation pressure and wasting classroom time may be the challenges faced when creating scenarios.

Figure-2.12. Classroom pressure and waste of classroom time in teacher created scenarios



The 20th and 21st questions are to investigate the assistance and necessity of situational creation in teacher teaching (Figures 2.13 and 2.14). Teachers all believe that scenario creation is helpful for teaching, with 35.7% of teachers choosing "very helpful". Regarding the necessity of scenario creation, only 3.6% of teachers believe that scenario creation is optional, while the rest of teachers choose "very necessary", indicating that teachers are more supportive of creating scenarios in teaching.

Figure-2.13. The help of scenario creation for teachers' teaching

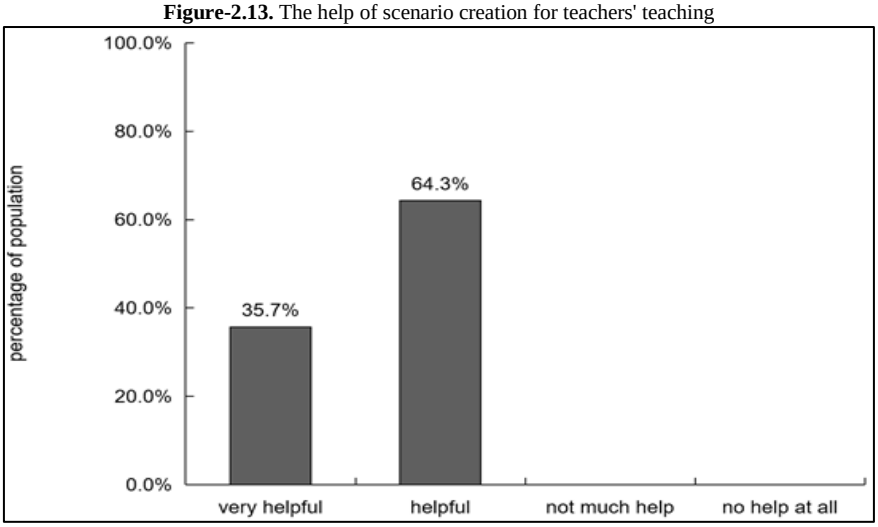
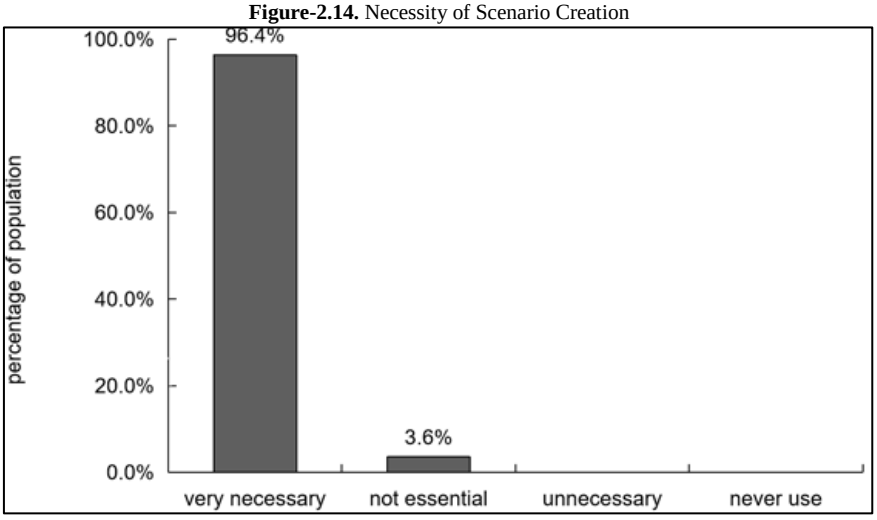


Figure-2.14. Necessity of Scenario Creation



The 20th and 21st questions are to investigate the assistance and necessity of situational creation in teacher teaching (Figures 2.13 and 2.14). Teachers all believe that scenario creation is helpful for teaching, with 35.7% of teachers choosing "very helpful". Regarding the necessity of scenario creation, only 3.6% of teachers believe that scenario creation is optional, while the rest of teachers choose "very necessary", indicating that teachers are more supportive of creating scenarios in teaching.

3.6. Student Questionnaire Survey Results and Analysis

（1）Student attitudes towards biology

Interest is the best teacher, and students who are interested in biology are more motivated to consider how to learn biology well. In the first question, 84.5% of students are interested in biology, of which 32.6% express a certain interest. In question 2, 27.0% of students always want to learn biology well, and 56.0% of students often consider how to learn biology well (Table 2.6). These two survey results also correspond. A small number of students are not very interested in biology and rarely consider how to learn biology well. Regarding whether students will conscientiously complete the homework assigned by the teacher after class, 46.8% of students chose "always", 47.5% of students chose "frequently", and only 5.8% of students were unable to complete the homework assigned by the teacher seriously. Overall, students' performance in completing assignments is relatively good, indicating a more serious attitude towards learning biology.

Table-2.6. Student Attitudes towards Biology

Type	Option	Quantity	Percentage
1. Are you interested in biology knowledge?	A. Very interested	140	32.6%
	B. be interested	223	51.9%
	C. Not very interested	55	12.8%
	D. uninterested	12	2.8%
2. Have you ever thought about how to learn biology well?	A. Always	116	27%
	B. Often	241	56%
	C. Rarely	61	14.2%
	D. Almost not	12	2.8%
3. Do you take the homework assigned by the teacher seriously?	A. Always B. Often	201 240	46.7% 47.4%
	C. Rarely	12	2.8%
	D. Almost not	13	3%

（2）Methods for Students to Learn Biology

When asked what methods students usually use to learn biology, it was found that only 46.3% of students rely on understanding and memory, 23.5% rely on problem-solving, 18.1% rely on rote memorization, and 12.1% learn through other methods. In terms of active learning before class, 53.3% of students seldom take the initiative to preview new lessons, and 8.6% of students choose "almost never", only 5.6% always take the initiative to preview new lessons (Table 2.7).

Table-2.7. Methods for Students to Learn Biology

Type	Option	Quantity	Percentage
4. What method do you usually use to learn biology?	A. Rote memorization	78	18.1%
	B. Doing and brushing questions	111	23.5%
	C. Understanding Memory	199	46.3%
	D. other	52	12.1%
5. Do you proactively preview new classes before class?	A. Always	24	5.6%
	B. Often	140	32.6%
	C. Rarely	229	53.3%
	D. Almost not	37	8.6%

The above data indicates that some students' learning methods need to be changed, relying solely on rote memorization does not truly understand biological knowledge, and it is easy to forget over time. Students' ability to learn independently is also weak, and they do not know about active learning.

（2）Student Biology Classroom Performance

Table-2.8. Student Biology Classroom Performance

Type	Option	Quantity	Percentage
6. Do you actively answer questions in class?	A. Always	52	12.1%
	B. Often	131	30.5%
	C. Rarely	198	46%
	D. Almost not	49	11.4%
7. Do you concentrate for a long time in class?	A. Always	55	12.8%
	B. Often	156	36.3%
	C. Rarely	148	42.8%
	D. Almost not	35	10.5%
8. Do you ask the teacher questions in class?	A. Always	37	8.6%
	B. Often	125	29.1%
	C. Rarely	240	47.4%
	D. Almost not	64	14.9%

In question 6, 30.5% of students stated that they often take the initiative to answer questions in class. But only 12.1% of students always take the initiative to answer questions in class. Although students are interested in biology knowledge, their subjectivity and classroom enthusiasm are not obvious enough, and most students are unwilling to actively answer questions. For the survey results of question 7, 53.3% of students stated that they are prone to being distracted in class and cannot concentrate for a long time on learning content. This may be related to the teacher's single teaching method and the lack of materials for creating scenarios, resulting in students not being interested. In question 8, 8.6% of students always ask the teacher when encountering problems in class, and 47.4% of students say they rarely ask the teacher questions (Table 2.8). But if students simply listen to the teacher and do not actively participate in the classroom, and are not good at asking questions and thinking in the classroom, it will lead to low classroom learning efficiency and the inability to improve their scientific thinking ability.

(4) Student's learning of biology knowledge

Table-2.9. Student's Learning Situation of Biology Knowledge

Type	Option	Quantity	Percentage
9. Will you use your biological knowledge to explain some life phenomena after class?	A. Always B. Often	52 147	12.1% 40.4%
	C. Rarely	168	39.1%
	D. Almost not	38	8.4%
10. Are you satisfied with your current biology grades	A. Very satisfied	43	10%
	B. satisfied	58	13.5%
	C. Not very satisfied	200	46.5%
	D. dissatisfied	129	30%

Regarding whether students can use their biological knowledge to explain some life phenomena, 39.1% of students stated that they rarely use their knowledge to explain life phenomena related to biology, and even 8.4% of students stated that they hardly know. Only 12.1% of students always explain life phenomena based on their biological knowledge. Only 10% of students are "very satisfied" with their current biology grades, with 13.5% choosing "satisfied" and the remaining 76.5% not satisfied with their grades. (Tables 2.9). From the above data, it can be seen that students lack a sufficient understanding of the current biological knowledge and cannot apply it to their daily lives. The realization that knowledge comes from life and is applied to daily life also requires further improvement in students' academic performance.

3.7. Interview Results and Analysis

3.7.1. Interview Results

Interviewer: Could you please share your views on scenario creation.

Teacher Xu: Creating authentic and effective situations can connect with the teaching content, increase students' interest in learning, and stimulate thinking and exploration.

Teacher Kong: Scenario creation is an effective means to solve the key and difficult points in teaching. Reasonable use of scenario creation can help students comprehensively and quickly understand key and difficult knowledge.

Teacher Wang: Firstly, scenario creation is very necessary. The current college entrance examination focuses on students' ability to solve problems, especially in real-life situations, by applying the knowledge they have learned to solve problems. Some of the knowledge that students learn is untenable without a specific context. For example, haploid breeding will ultimately result in homozygote, but the premise is diploid plants, such as corn and wheat. In such a situation, this knowledge can stand firm. If it is a tetraploid haploid breeding, the result is not necessarily homozygote, so it is necessary to create a situation.

In addition, teaching students knowledge in a specific context makes it easy for them to remember the knowledge. This is not only a mechanical memory process, but also a more effective understanding and application of knowledge.

Teacher Huang: Scenario creation refers to setting a certain context during the teaching process, promoting classroom teaching, bringing students into this context, and allowing them to better experience the classroom.

Teacher Shi: Students often feel drowsy and deviate from the topic in class due to dull knowledge. It is crucial to create specific and vivid biology teaching scenarios in order to attract students' attention and stimulate their interest in the subject in the classroom. In the teaching process, the correct application of scenario creation can motivate, awaken, and inspire students. Carefully design teaching scenarios that align with students' actual needs, identify teaching entry points, stimulate students' strong interest in learning, and enable them to consciously and actively engage in learning.

Teacher Ning: Situational teaching, as the name suggests, is a teaching method that creates corresponding teaching contexts, guides students to explore independently or through group cooperation, promotes students to better integrate into learning, and enhances learning pleasure. By creating corresponding scenarios, such as in the section on "Material Transmembrane Transport Mode", which is a compulsory course in the new textbook, the struggle between white blood cells and viruses is demonstrated through videos, accompanied by exaggerated self narration of white blood cells, which stimulates students' interest in learning and makes the classroom more dynamic and lively. The retention rate of learning can reach 20%, which has greatly improved compared to before.

Interviewer: Could you please talk about the types of situations you often create and the classroom effects.

Teacher Xu: In daily teaching, problem situations and life situations are relatively more commonly used. The real situations in life include both scientific issues and humanistic and social issues. Connecting to real-life situations can better stimulate students' interest in learning and resonate with them.

Teacher Kong: I have used problem situations and life situations, but the results are not very satisfactory.

Teacher Wang: The situations I often create include problem situations and life situations. Problem scenarios are often used in the classroom introduction process. Life situations mainly help students understand a certain knowledge, especially a deep learning of knowledge. Life situations are also a way to help students think and solve problems. Learning biology knowledge is to be applied in real situations, so situational creation is necessary in classroom teaching.

Teacher Huang: The types of situations I often create include problem situations and experimental situations. If there are classroom effects, such as some interesting topics, students will be more interested and quickly enter the classroom. The learning mood is high, and there is a certain effect, but it is not very obvious.

Teacher Shi: When I was teaching protein, I introduced the once sensational events of "Sanlu Milk Powder" and "Big Head Doll". Show pictures in multimedia courseware, create scenarios, and introduce proteins into this lesson. Through this form, students' attention is greatly attracted, they actively think, become more involved in the classroom, and improve classroom teaching efficiency. When talking about plant hormones, ask questions based on life experience and ask students to think, "When you usually buy bananas that are not very ripe, you can often put an apple in the bag, and after a period of time, you will eat delicious bananas. What is the principle? Students quickly come up with answers through life experience, and teachers guide students to understand the principles behind them, using this life context to help students better remember the knowledge points.

Teacher Ning: In daily teaching, there are many types of scenario creation. The most commonly used method is to create problem scenarios. For example, in the compulsory course II of the new textbook, "The double helix Model of DNA", through the form of question string: What is the basic skeleton of biological macromolecules? What are the basic scaffolds for biofilms? What about cytoskeleton? So what about the DNA we learned in this lesson? To stimulate students' thinking and introduce the structure of DNA.

Interviewer: Could you please talk about the difficulties encountered in developing scenario creation.

Teacher Xu: The situation in ordinary teaching is more casual, fragmentation, superficial, less rigorous, and lacks credible materials. Teachers have limited experience, lack learning opportunities, limited available resources, and limited contexts created.

Teacher Kong: There is not enough material to confirm the rationality of the situation.

Teacher Wang: Firstly, the source of scenario creation requires collecting a large amount of scenario materials and considering whether they can be used. Secondly, the authenticity of the situation. The created context may not necessarily be ideal, but it must be a real existence in real life. If the situation created for students is not real, it is easy to mislead students and fail to have a true teaching effect.

Teacher Huang: Firstly, there is a generation gap with the age of the students. Creating situations is not innovative enough to attract students. Secondly, using videos or some pictures to create scenarios, students are only interested in the introduction phase, and classmates turn their heads to discuss with each other. The classroom order is a bit chaotic, and when the teaching phase is over, students lose interest in learning.

Teacher Shi: Often using real-life situations in class to introduce new lessons and extend knowledge can help students better understand knowledge. At the same time, there are also some drawbacks. These situations open up

students' thinking and make them more active. After introducing a new lesson, students are still immersed in the situation and even engage in discussions with classmates, resulting in a waste of classroom time and difficulty in achieving teaching objectives.

Teacher Ning: Creating a situation is not an easy task to control. Sometimes it can cause students to wander and deviate from the classroom, disrupting the normal teaching order. Therefore, when creating a situation, one should carefully select the corresponding situation and make appropriate changes according to different class situations.

Interviewer: Could you please talk about what help you would like to receive when developing scenario creation.

Teacher Xu: I hope there can be some criteria for selecting situational materials, such as which principles to follow and what strategies to use. The school conducts more special lectures and teacher training, and adds some on-site classes.

Teacher Kong: I hope to have a set of effective situational creation strategies to implement situational teaching.

Teacher Wang: The most helpful thing is to have some convincing references with real experimental data. Nowadays, the college entrance examination requires students to have the ability to distinguish and make mental judgments. For example, there are a lot of fraud or pseudoscience in the society. Through education in high school and university, students at least have the ability to distinguish between truth and falsehood, which requires real situations to support. Usually, students can exercise in real situations, discover biological knowledge in a specific situation, and share the learned biological knowledge with others, making learning biology more interesting.

Teacher Huang: If we carry out scenario creation in every class, it requires very high teaching skills from the teacher. So I hope that the members of the lesson preparation team can work together, each person can provide feedback, and finally conduct a comprehensive review, gathering the strengths of various families, polishing each lesson well, designing a more perfect teaching content, and bringing students into the context well, so that they can learn and gain something.

Teacher Shi: Creating scenarios in the classroom often requires pictures and videos as assistance. We hope that the school can update multimedia devices in a timely manner and connect to the internet. During the teaching process, teachers can always search for information online and cite news materials to create scenarios.

Teacher Ning: Creating scenarios requires the full use of multimedia, so schools should strengthen teacher training, learn about animation creation, sound processing, and so on.

3.7.2. Interview Analysis

Six teachers, based on their teaching experience and classroom teaching situation, explained their views on scenario creation, the types and classroom effects of scenario creation, the difficulties encountered in developing scenarios, and the help they hope to receive. Analyze the interview content of six teachers, and the results are as follows:

Firstly, all six teachers recognized the importance of creating situations in teaching and affirmed the importance of creating situations. This is consistent with the results of the teacher survey questionnaire, 'Do you think it is necessary to create a teaching context?'. In summary, there are several reasons. Firstly, scenario creation can stimulate students' interest in learning, stimulate their thinking, and make it easier for them to participate in classroom teaching activities and understand the key and difficult points of textbook knowledge. Secondly, scenario creation can assess students' ability to solve practical problems and meet the requirements of educational development. Finally, scenario creation can improve students' learning retention rate, which is also the ultimate goal of classroom teaching. Although teachers have slightly different intentions in creating situations, they ultimately aim to better complete teaching tasks and enable students to apply what they have learned. In practical teaching, teachers should accurately grasp the purpose and significance of situational creation, create an appropriate and reasonable teaching situation for students, stimulate their learning enthusiasm, and fully develop their imagination and creative thinking.

Secondly, different teachers have different opinions on the types of scenarios created and the effectiveness of the classroom, but everyone believes that scenario creation can improve classroom efficiency and enhance students' learning abilities. Different teachers are able to create situations suitable for their classroom teaching based on their own teaching experience. Six teachers mentioned frequently creating problem and life situations in the classroom. In addition to creating problem situations, Teacher Huang also created experimental scenarios for teaching in class, while other teachers did not mention experimental scenarios. For high school biology textbooks, each volume contains relevant experimental content, with the aim of assessing students' hands-on operation ability and cultivating their scientific exploration spirit. High school biology is a subject based on experiments. Many scientists are able to discover the mystery of life through countless experiments, such as the transformation experiment of pneumococcus in Compulsory Course II, and the experiment of phage infecting Escherichia coli. Therefore, the creation of experimental scenarios needs to be given attention in high school biology teaching.

Thirdly, it is not an easy task to use scenario creation reasonably in the classroom. The difficulties faced by six teachers in creating scenarios can be summarized in two aspects. On the one hand, it is the basis for selecting situational materials. The rationality, authenticity, and novelty of the situation are difficult to determine, and the created situation is not ideal; On the other hand, it is about classroom control. Three teachers mentioned that creating situations can increase students' enthusiasm for learning, but it can also lead to disorderly classroom order, making it easy for students to daydream and difficult to complete teaching objectives on time. This is also a common problem in the classroom.

Fourthly, six teachers proposed their own needs based on the difficulties encountered in creating their own teaching scenarios. I hope to learn the relevant criteria or principles for selecting situational materials and have a set of useful situational creation strategies. The school can provide more authoritative references, websites, and material libraries, strengthen teacher training, conduct expert lectures, update multimedia equipment in a timely manner, and cooperate with lesson preparation team members.

Through the above analysis, the author has gained a more accurate and comprehensive understanding of the views of biology teachers in internship schools on scenario creation and the application of scenario creation in biology classroom teaching. At the same time, the author has also discovered the difficulties encountered by teachers in creating scenarios and the assistance they expect to receive.

3.8. Summary of the Current Situation

Teachers' understanding of scenario creation is not comprehensive and in-depth enough, and they have not systematically studied relevant theoretical guidance. Teachers lack the basis for creating situations, and the forms of situations they create are singular and lack attractiveness. Situations become a layer of "sugar coating" artificially wrapped in the course content (Peng, 2022). Currently, many teachers have misconceptions about the practice of situational teaching, mainly reflected in the unrealization, dissociation, and excessive use of situations, which seriously affect the development of students' core literacy (Wu, 2017). The teaching concept of the new curriculum standard mentions the need to pay attention to the connection with real life, requiring students to apply the knowledge, skills, and attitudes they have learned to problem-solving and decision-making in real life after the course is over (Ministry of Education of the People's Republic of China, 2022). Teacher Tan Yongping also pointed out that creating situations should pay attention to authenticity; Propose questions based on the context that point to core competencies; Scenario creation should run through the entire class, except for introducing chapters, it should be created in the main text, student activities, and after-school exercises (Tan, 2019). Research has shown that interest plays an important and wonderful role in students' learning. Many times, students do not lack the ability to learn, but rather lack learning motivation (Schiefele, 1991). For students with strong learning interests, the learning effect is also significant (Zhao, 2021). Therefore, the creation of contexts by teachers cannot only be reflected in the classroom introduction process. In each teaching process, situational materials should be reasonably selected to avoid the "sugar coating" effect of contexts.

4. Principles of Scenario Creation

A good scenario creation can create a harmonious and interactive learning environment between teachers and students, allowing some abstract knowledge in textbooks to break free from the constraints of "inert knowledge" and become lively, allowing students to unconsciously acquire knowledge and reducing the burden on students' understanding of knowledge. By reading literature, summarize the four principles of situational creation for teachers to refer to in the process of conducting situational teaching.

4.1. Targeted Principle

Determining teaching objectives is particularly important in the entire process of instructional design. Without accurate teaching objectives, teaching is based on non-existent needs. The formulation of teaching objectives is related to the direction, progress, and expected results of the entire teaching activity. Creating a context is to assist teachers in efficiently achieving teaching objectives, completing teaching tasks on time, and achieving expected teaching outcomes. It also guides students to deeply understand knowledge, utilize knowledge, and engage in meaningful learning. Therefore, in the process of lesson preparation, teachers should determine teaching objectives according to the requirements of the new curriculum standards, carefully study the content of the textbook, and use certain textbook materials to select situational materials suitable for the teaching content of this lesson, cleverly integrating knowledge into it. Teachers transmit knowledge in the context, while students acquire knowledge in the context, achieving conditional and contextualized knowledge. During the teaching process, teachers should guide students to gradually approach the teaching objectives in the context, encourage students to think actively by asking a series of related questions, and guide students to gradually achieve the expected teaching objectives. For example, when explaining the section on "Characteristics of Population", the teacher adopts a problem-solving approach to focus on learning priorities. What is the role of studying the quantitative characteristics of populations? What problems can it help us solve? What are the characteristics of the population size? How to conduct statistics on population quantity characteristics? At the same time, these questions also lay the foundation for students to understand and construct mathematical models of population changes. In the process of designing homework, teachers can guide students to hands-on practice, step by step strengthen their understanding of textbook knowledge, and better achieve teaching objectives. For example, in the section of "Division of work and cooperation between organelle", the teaching goal requires students to make a three-dimensional model of eukaryotic cell structure according to their own understanding of the relationship between the whole and the local cells. In the existing teaching materials, students can see the structural pattern diagram of plant cells and animal cells under the sub microscope, and the numerous organelle structures add to students' memory burden. Teachers can require students to manually draw structural pattern diagrams of plant and animal cells after class. During the drawing process, students' minds are constantly demonstrating this process. By using both hands and brains, students can deepen their memory, increase their sense of achievement in learning, and experience the joy of learning biology.

4.2. Principle of Authenticity

Contemporary scientific education research has pointed out that when students first enter school, due to their accumulated life experiences or some emotional impressions, their minds will form a complex cognitive system of things around them and the natural environment. For example, any flying animal is a bird, the growth of seeds only requires soil and water, and whales are fish, among other daily concepts. These everyday concepts are referred to as' pre scientific concepts'. This' pre scientific concept 'contradicts some of the scientific concepts and knowledge in textbooks. Teachers need to gradually transform the existing concepts in students' minds into relatively scientific concepts through scientific teaching activities. By immersing students in real situations, they can realize that their original understanding or experience cannot explain the current situation, leading to cognitive conflicts and dissatisfaction with existing concepts. Teachers present new concepts and create opportunities to guide students to understand, thereby recognizing the rationality and effectiveness of the new concepts. Therefore, in the process of situational teaching, teachers should pay attention to the authenticity of the situation, pay attention to students' daily life experiences and original ideas, and cannot fabricate false situations, causing students to have incorrect cognition. Real situations can come from daily life examples, social hotspots, model construction, experimental operations, history of science, etc., so that students can acquire knowledge in real situations and apply it to real situations. For example, most students believe that viruses are not living organisms because they do not have a cellular structure. When teachers explain that "life activities cannot be separated from cells", they can first play the video "The proliferation process of COVID-19 after infecting human cells and the harm to human body". After watching the video, students described the proliferation process of COVID-19 after infecting human cells, and found that the life activity of COVID-19 can not be separated from cells. Then the teacher corrected the students' misconception that the virus belongs to a special kind of organism and must be parasitized in the cells to survive. Through the video, the students realized that COVID-19 mainly invades the mouth, nose, pharynx and lungs of the human body, causing upper respiratory tract infection symptoms. In real-life situations, students should comply with epidemic prevention and control requirements, wear masks reasonably, reduce going out, and prevent cross infection and transmission of the virus.

4.3. Emotional Principles

Psychologists have found that the results of students' learning may lead to changes in their abilities and tendencies. Ability is acquired by students, and tendency changes mainly focus on students' emotional domains. Emotional field is an aspect related to students' emotions in Bloom's taxonomy of educational goals. If students' emotional needs can be met, they can be more actively engaged in learning and improve classroom efficiency (Yang, 2017). Therefore, emotional education should be permeated into the situations created by teachers, such as patriotism, cherishing life, and loving biology. The process of teaching is also a process of emotional communication between teachers and students. Only by establishing a good emotional relationship between teachers and students can students view their teacher's behavior with a more positive perspective, recognize them emotionally, and actively cooperate with teaching work in the classroom (Wang, 2018). Especially in the teacher-student interaction process, teachers should incorporate their own emotions, enhance their affinity for students, pay attention to analyzing students' emotional changes, stimulate students' emotional experiences, and thus arouse emotional resonance between students and teachers. For example, when explaining the content of "hybrid breeding", the teacher first introduces the "China threat theory" proposed by the famous American agricultural and ecological scholar Brown, which is "who will feed China". This makes students realize that China once faced a serious food crisis and tells them to learn to cherish food, causing emotional resonance among students. Show the photos of Academician Yuan Longping, the father of hybrid rice, standing in the sun, sweating profusely, personally studying rice in the field, as well as his award speech as the person of the year who moved China in 2004. Finally, the question is raised: How is hybrid rice cultivated? By creating this realistic and intuitive scenario, students can realize that it is precisely because of the hybrid rice cultivated by Yuan Lao that we can successfully solve the problem of food scarcity in China. We can also appreciate the patriotic spirit and dedicated scientific spirit of scientists, recognize that the advancement of breeding technology can benefit humanity, and stimulate students' thirst for knowledge and exploration of scientific research in textbooks. When explaining the section on "Cell Carcinogenesis," the teacher presented a big data report on cancer in China, listing some familiar public figures who died from cancer, as well as the nuclear radiation caused by World War II that led to many Japanese deaths from cancer. Students were asked to brainstorm and ask their most interesting questions, such as what causes cancer? How to prevent cancer? Can cancer be inherited? What is the difference between cancer cells and normal cells? Give full play to the main role of students, awaken their emotional cognition, and trigger their social emotions of loving peace and cherishing life.

4.4. Developmental Principles

The goal of education is not for students to excel or perform well in school, but to develop comprehensive qualities that accompany them throughout their lives, helping them to flexibly apply their knowledge and live a better life after leaving campus. The Outline of Education Planning also points out that the teaching content should meet the students' cognitive level, set teaching goals for students' lifelong learning and development needs, focus on ability training, improve scientific literacy, cultivate innovative talents, and meet the national development needs. Therefore, the situations created by teachers also need to be considered from the perspective of students' development. Based on the difficulty level of the teaching materials, reasonable selection of situational materials should be made, and students' ability range should not be ignored in order to create situations. Ultimately, students

not only cannot learn knowledge, but also lose confidence in learning biology. For example, when explaining the content of "separation law", it is difficult to understand the scientific explanation of separation phenomenon. If teachers use pictures or blackboard writing to visually demonstrate this process to students, students may find it difficult to understand the essence of the separation law. If the teacher provides students with experimental materials based on the simulation experiment of the neutral separation ratio in the textbook, they can collaborate in groups to complete the experiment. Through students' actual experimental operations, not only can they understand the significance of each step in the experimental process, experience the process of genetic factors separating from each other, and randomly combining male and female gametes, but also lay the foundation for further understanding Mendelian's pea hybridization experiment.

5. Strategies for Scenario Creation

In teaching, teachers often rack their brains to create a new and interesting situation to stimulate students' interest and promote students' active learning. But after the introduction of the new lesson, the situation was forgotten by the teacher, and the classroom was also lively at the beginning, but then fell into a state of dullness. Students could only maintain a brief interest in learning. Moreover, the context created by the teacher is not closely related to the content of the textbook, and students' thoughts deviate from the topic, preventing them from returning to the classroom for a long time, which is actually counterproductive. For example, when a teacher is explaining the section on "genetic mutations", playing a video clip about mutated individuals can make students excited, but the content lacks scientific significance and is not very helpful for actual teaching. Therefore, teachers need to master a set of practical and feasible situational creation strategies to enable students to maintain a learning interest throughout the entire class, focus on classroom learning, and efficiently achieve teaching objectives.

Through reading literature, it was found that many researchers have proposed situational creation strategies. For example, Wang Jianhua used the section on "Regulation of Blood Glucose Balance" as an example to create a scenario by presenting a blood routine test chart, laying the foundation for the concept of homeostasis. Introduce the concept of blood sugar through real-life examples, and then analyze the source and destination of human blood sugar. Finally, students were asked to simulate the construction of blood glucose regulation models using cards of different colors, which deepened their understanding of the mechanism of blood glucose regulation (Wang, 2018). Throughout the class, the teacher utilized images, real-life examples, and models to reproduce the situation, fully leveraging the important role of scenario creation in teaching. Similarly, Zhang Yanxia takes the section on "Changes in Population Gene Composition" as an example. The teacher first creates a scenario by displaying pictures of the birch geometer and introduces it into the new lesson; Let students understand historical materials, create real situations, and ask questions to guide them in acquiring knowledge; Finally, create a digital context to overcome teaching difficulties (Zhang, 2022). This class mainly uses pictures, historical materials, and numbers to create scenarios, highlighting the effective combination of scenario creation and problem posing. It revolves around the "industrial blackening" phenomenon of the birch geometer, allowing students to better understand the essence of biological evolution. For example, Zhang Airan started from a breakfast video as a real-life experience, created a real situation, sparked student discussions, and successfully entered the teaching theme (Zhang, 2022). Through role-playing, students can understand the abstract process of dehydration and condensation. Guide students to pay attention to the scientific frontier by using the research results of the spike S protein of COVID-19, a social hotspot.

From the above, teachers can help students quickly enter the classroom and focus on classroom learning by creating situations with pictures, videos, life examples, social hotspots, history of science, etc. On this basis, this study summarizes the strategies for scenario creation for frontline teachers to learn from.

5.1. Creating Scenarios Using Images and Videos

Images and videos, as intuitive and convenient situational materials, are not only widely used by teachers, but also popular and loved by students. If there is only dry text in the textbook, it lacks a certain level of vividness and interest. Therefore, the biology textbooks we use have also added many pictures to attract students' attention. Especially in the 2019 version of the new textbook, compared to the old textbook, many new images have been updated and added. For example, the new textbook has updated the images of interspecific relationships and added a comparison before and after the transformation from barren mountains to green mountains, making students realize the importance of returning farmland to forests, grasslands, and lakes. When students observe images, they will receive a large amount of visual representations, which are considered a very important form of memory encoding and storage. Therefore, teachers use pictures to create situations and assist in teaching, which is beneficial for students to deepen their memory and understanding.

Multimedia devices such as Xiwo electronic whiteboards, exhibition booths, projectors, and other equipment have been widely used in most schools. This provides great convenience for teachers to play animations and create scenarios through videos. In teaching, some dynamic changes are simply displayed through text or pictures, which students cannot fully understand. Videos can display this dynamic process for students to understand.

5.2. Creating Scenarios Using Life Phenomena

Biology can be seen as the discipline closest to actual production and life, where knowledge is used and derived from life. Psychological research shows that the closer a student's learning content is to real-life phenomena, the higher their comprehension ability. Some common life phenomena contain rich biological knowledge and are in line with students' cognitive level. For example, abandoned farmland and grassland after fire belong to secondary

succession. Sangji fish ponds, crop weeding, and zoned rotational grazing involve the significance of ecosystem energy. Teachers use these life phenomena to create teaching contexts and combine them with the theory of the zone of proximal development to create cognitive contradictions between students' textbook knowledge and life experience, thereby stimulating students' strong learning interest and exploration desire, and promoting students to actively learn and explore the true knowledge behind cognitive conflicts. At the same time, it can also allow students to feel the value of biological knowledge and experience the sense of achievement brought by the application of knowledge.

5.3. Creating Scenarios through Exploratory Practice

Almost every chapter of the textbook is equipped with exploration and practice modules. During the teaching process, teachers should arrange teaching tasks reasonably, lead students to personally participate in the practical process, and enter nature. Students experience the joy of learning in practical situations, understand the harmony and unity between biology and the environment, and improve their practical abilities. For example, the teacher leads students to conduct on-site inspections of an ecosystem, such as a small lake or grassland near the school, and guides students to discuss the components of the ecosystem and the relationships between them. Students can understand the complex nutritional structure of producers and consumers in an ecosystem through the food chain and food web.

5.4. Creating Scenarios Using Research Cases

Botanist Hutchinson once said: "The stage of ecology, the performance of evolution". The long process of evolution and succession between organisms and the environment has been discovered by many scientists through continuous exploration and research. There will be interviews with scientists at the beginning of the new textbook, which also adds a lot of history of science. For example, at the beginning of "Biology and the Environment", Professor Jing Yun was interviewed by Professor Fang. Professor Fang shared his scientific research achievements, the difficult conditions of going to the Arctic for exploration, and the significance of studying ecology with students. Teachers can start from the perspective of scientific inquiry and guide students to understand the conclusions of the textbook from the perspective of the phenomena and results obtained by scientists during the experimental process by introducing real research cases into classroom teaching. Scientific research cases not only enable students to understand the true situation of scientific research, but also demonstrate the scientific spirit of scientists who are hardworking and pragmatic, thereby cultivating students' scientific thinking.

6. Expectation

The situational creation teaching model breaks the traditional phenomenon of teacher centered teaching, emphasizes students' autonomy more, and highlights their classroom subjectivity. Based on the survey of the current situation of scenario creation in high school biology classroom teaching, the following suggestions are proposed for reference at the teacher and school levels.

（1）Teachers change their teaching philosophy and create diversified situational classrooms

Teachers need to change their teaching philosophy so that scenario creation is no longer limited to the introduction process. Whether it is the teaching or questioning session, teachers can choose appropriate situational materials for teaching. In the teaching process, teachers create teaching contexts and transmit knowledge to students in a specific context, making it easy for students to remember, and their understanding and application of knowledge will also be relatively effective. In the questioning session, the teacher helps students review old knowledge through question strings, enhances the firmness of the learned knowledge, and deepens students' understanding and perception of the knowledge.

（2）Teachers should use situational materials reasonably to create a harmonious and orderly situational classroom

When selecting situational materials, teachers should follow appropriate principles to screen, and the selected scenarios can be novel, but cannot be separated from teaching objectives. To be truthful and meaningful, one should not choose some fantasy science fiction films, which lack scientificity and can mislead students. More importantly, it can bring students into the context, stimulate their collective thinking, diverge their thinking, create a harmonious and orderly situational classroom, and achieve the ultimate goal of teaching.

（3）Schools provide learning platforms to enhance teachers' situational teaching abilities

Schools should provide teachers with some learning platforms, such as authoritative websites and reference materials, and form a situational material library. Schools should also strengthen the training of teachers, conduct expert lectures, participate in off campus training, and hold teaching competitions within the school. In the lecture section, members of the group are required to cooperate with each other, synthesize their opinions, polish each lesson well, and design a wonderful situational teaching content. In terms of hardware facilities, schools should timely update multimedia, Hivo whiteboards, projectors and other equipment, guide teachers to use these hardware facilities, and provide free network services. In summary, schools should provide teachers with learning platforms as much as possible to improve their situational teaching abilities.

In future teaching, teachers should always pay attention to the latest literature related to "situational creation", try to create scenarios in different teaching types and links, explore more situational creation strategies, and continuously improve their teaching skills while developing students' core biological literacy.

This study uses questionnaire survey and interview methods to understand the current application status of scenario creation in the second year of senior high school internships. The proposed principles and strategies for scenario creation can be used as a reference for biology teachers in frontline high schools, as well as for other disciplines, and have important application value.

Acknowledgments

This work was financially supported by the Training Plan of Young Backbone Teachers in Colleges and Universities of Henan Province (2019GGJS162), UGS Teaching Reform Research Project for the Strong Teacher Program in Basic Education of XYNU (2022-GTTYB-04), Research Project on Teacher Education Curriculum Reform of XYNU (2022011), Quality Curriculum Project for Graduate Education of XYNU (2022).

References

Jiang, W. M. (2005). *John dewey how we think, experience, and education.* East China Normal University Press: Shanghai.

Liu, H. C. (2021). The experience and context of dewey's philosophy: A comparison with marx's view of practice. *Academic community*, 36(6): 30-38.

Ministry of education (2019). Opinions of the central committee of the communist party of China and the state council on deepening education and teaching reform and comprehensively improving the quality of compulsory education. *People's Education*, 70: 7-11.

Ministry of Education of the People's Republic of China (2022). *General high school biology curriculum standards (2017 edition, revised in 2020).* People's Education Press: Beijing.

Peng, C. (2022). The basic connotation, practical dilemmas, and cracking paths of teaching situations. *Contemporary Education Science*, 37(12): 40-46.

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26(21): 299-323.

Tan, Y. P. (2019). A new high school biology textbook with the aim of developing core competencies. *Course Textbook Teaching Method*, 39(11): 104-09+15.

Wang (2018). Teaching design for blood sugar balance regulation based on the steady state and balance view. *Biology Teaching*, 43(11): 23-25.

Wang (2020). Context: Meaning, characteristics, and construction - an analysis of li jilin's context view. *Education Research*, 41(9): 81-89.

Wu, J. H. (2017). The practical misunderstandings and countermeasures of current situation teaching in biology. *Teaching and Management*, 719(34): 72-74.

Yang, H. R. (2017). Emotional teaching makes biology classrooms more efficient. *Education*, 47(13): 39.

Yu, Z. Y. (2023). That's clear contextualized learning: Connotation, value, and implementation. *Journal of East China Normal University (Education Science Edition)*, 41(1): 89-97.

Zhang, X. (2022). Airan problem driven high school biology classroom teaching practice in real situations - taking proteins and nucleic acids are important biological macromolecules as an example. *Middle School Biology*, 38(11): 34-36.

Zhao, W. H. (2010). *Research on dewey's theory of situation.* Shandong Normal University.

Hu, J. M. and Zhao, L. Z. (2021). He developmental stages, influencing factors, and stimulating pathways of learning interest. *Curriculum, Textbooks, Teaching Methods*, 41: 78-85.

Zhou, Y., Liu, Y. and Li, G. F. (2022). Characteristics and trends of research on biological situational education from 2000 to 2020-visual analysis based on citespace. *Middle School Biology*, 38(2): 75-78.