

# Situational Teaching Method -- Lighting the Beacon on Your Way to Biology Learning in High School

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## Abstract

**Scientific thinking is an important part of the core quality of biology. By creating effective teaching situations and designing questions with certain inspiration and appropriate complexity, students can use scientific thinking methods to analyze and solve problems, which will help to improve students' scientific thinking ability and help students form the habit of scientific thinking. Using situational teaching method in biology classroom teaching can greatly improve students' interest in learning biology, promote students to actively build knowledge and improve learning efficiency.**

## Keywords

**Situational teaching method; Scientific thinking; Core literacy of Biology; High school biology.**

## 1. Introduction

With the rapid development of China's education, society, schools and students have higher and higher requirements for the quality of biology teaching in senior high school [1]. Teachers must change the previous teacher-centered teaching thought and establish the student-centered teaching principle in the classroom. As a new teaching mode, situational teaching method can significantly improve students' academic performance, stimulate their interest in learning, help students understand and master knowledge, and improve students' learning efficiency and enthusiasm.

## 2. Advantages of Situational Teaching Method

Situational teaching method means that in education and teaching activities, teachers purposefully create a meaningful, vivid and typical scene through language, emotion and action, teaching content and other teaching materials and tools, using social hot issues, multimedia, experiments and other strategies. Let students put themselves in the real learning situation and feel the charm and power of learning. It has a great enlightenment for students who lack learning ideas. Apply what they learn and teach students according to their aptitude, so that knowledge is no longer limited to textbooks and life is full of fun of learning [2].

### 2.1. Promote Cognition

Emotion has a dynamic regulating effect on cognitive activities. Positive and healthy emotions will play a positive role in promoting cognitive activities. On the contrary, negative and bad emotions will hinder cognitive activities. Situational teaching is to mobilize students' positive emotions, improve students' interest in learning, and cultivate students' habit of active and happy learning. Emotion has intensity. An appropriate intensity will produce a pleasant emotion, which is conducive to the organization and development of intellectual activities,

improve students' scientific thinking ability, make students relaxed, happy and calm, and promote the in-depth development of teaching activities.

## **2.2. Promote Students' Unconscious Learning**

Cognitive activities must have conscious thinking and imagination, but people's cognitive tasks can not be completed by conscious psychology, but also need the effective participation of unconscious psychological activities. Situational teaching method uses relevant resources and equipment to build a specific learning environment, let students truly participate in it to complete tasks, realize the intuitive transformation of course content, effectively induce and make use of the cognitive potential provided by unconscious psychology, and let students unknowingly achieve the perfect organic unity of intellectual factors and non intellectual factors.

## **2.3. Suggestive Enlightenment**

Situational teaching method can integrate the teaching content into the specific image situation through language, music, video, experiment and other methods, and it is a typical and optimized well-designed situation. It has a significant subtle suggestive effect and can mobilize some clues of students' cognitive structure. Through thinking integration, students can smoothly obtain new knowledge or produce new cognitive structure, which plays a role in enlightening wisdom.

## **2.4. Cultivate Sentiment**

The carefully created scenes in teaching have an important edifying effect and have a beneficial impact on students' ideology. Under the influence of teaching situation, students can get emotional sublimation, improve students' scientific thinking ability and cultivate students' core literacy. Under the influence of teaching situation, students can get emotional sublimation, improve students' scientific thinking ability and cultivate students' core literacy.

# **3. Situation Design Strategy of Biology Teaching in Senior High School**

Situational teaching method aims to improve students' interest in learning biology, promote students to actively build knowledge, improve learning efficiency and cultivate students' bioscience literacy [3]. In creating situations, teachers should follow the principles of science, innovation and students as the main body.

## **3.1. Skillfully Setting Up Teaching Situations with Social Hot Issues as the Entrance**

Life science involves many fields such as ecological environment, medical research, human health and so on. There are many hot issues in life, such as the epidemic brought by SARS-CoV-2. In high school biology teaching, we can use this as an entrance to create teaching situations, so as to arouse students' interest in learning and desire for knowledge.

In immunology teaching, teachers can organize students to watch news about the latest situation of COVID-19 at home and abroad. At the same time, using rich multimedia resources such as animation, video and pictures, students can deeply understand the questions closely related to human health in the specific situation of images, so as to effectively implement the teaching contents of immunology.

## **3.2. Design Inquiry Teaching Situation.**

In the process of biology teaching in senior high school, teachers can reasonably design the inquiry situation, let students form the awareness of independent learning, and actively participate in biological inquiry activities, so as to form a deep understanding of the connotation of biological knowledge and effectively improve students' subjective initiative in biology learning.

Taking "Research on plant auxin" as an example, teachers can guide students to conduct corn germination experiment, guide students to observe the growth characteristics of corn coleoptile in different environments, record the growth of coleoptile, and present it in biology class by multimedia. In this process, students can not only form a preliminary understanding of this part of biological knowledge, but also realize the meaning and growth law of life through the observation of corn seed germination in the process of independent exploration and practice, which is of great educational significance for the cultivation of students' Outlook on life. Rational design of inquiry situation can not only enable students to effectively understand biological knowledge, but also enable students to recognize biological laws and experience the humanistic connotation and moral quality behind biological courses.

### **3.3. Using Experiments to Create More Intuitive Teaching Situations.**

Biology is a subject based on experiment, which pays attention to the combination of theory and practice. Biological experiment is essential in biology teaching in senior high school. In the teaching process, using experiments to create teaching situations can enable students to participate in experiments and observe experimental phenomena, so as to learn to guide practice with theory and test the reliability and authenticity of theory with practice. For example, when teaching the problem of plant phototropism, teachers can first let students experiment and explore whether plant seedlings will grow in the direction of light source. In the process of the experiment, students can compare the knowledge points learned according to their own experimental results. No matter whether the experiment is successful or not, students have cultivated their own ability in the process of exploration and fully mastered the relevant knowledge points in books.

In the process of biology teaching in senior high school, teachers make rational use of experiments to create teaching situations, which can not only arouse students' curiosity and thirst for knowledge, but also enable students to continuously learn knowledge in the process of observation and practice, improve their knowledge system, and enable students to actively explore, think and summarize.

### **3.4. Setting up Inquiry Teaching Situation Based on Experiments in the History of Science**

Almost every biological concept and principle has been explored by many scientists for many years. The development of classical experiments in the history of science as materials is conducive to improving students' scientific inquiry literacy. For example, "auxin discovery process" can design the process of situational teaching as follows:

Situational material: experiments of Charles Robert Darwin, Peter Boysen-Jensen, A.Paal and F.W.Went in the discovery of auxin.

The main line of problem design: analyze the independent variables and dependent variables of the experiment; According to the experimental phenomena, the experimental conclusions are drawn from the analysis of independent variables and dependent variables; Try to analyze independent variables and dependent variables according to the purpose of the experiment, evaluate and design the experiment.

### **3.5. Design Questions and Create Teaching Situations.**

Question situation refers to a situation created purposefully and consciously by teachers in the teaching process to guide students to question and explore solutions. Teachers can reasonably design some biological questions in combination with teaching objectives and students' interests, guide students to think and analyze independently, stimulate students' thirst for knowledge, let students master relevant course knowledge in the exploration of biological questions, and deepen students' emotional experience of biological situation [4].

For example, when explaining the relationship between producers, consumers and decomposers in the biosphere, teachers can first ask "where did the leaves fall from the tree go?" Let students think independently or discuss in groups and draw conclusions. According to the questions raised by teachers, students can understand and master knowledge points in the process of thinking about relevant questions. Students learn with questions, which not only makes students learn better, but also improves the quality of teaching.

#### 4. Research Defects and Future Direction

Situational teaching is to promote students' efficient learning, but sometimes due to lack of experience in creating situations, situational teaching often becomes a mere formality. Therefore, the creation of simulation situation should be novel in form, and novel stimulation is easier to arouse students' thirst for knowledge; The content should be practical, and the created situation should effectively achieve the goal, not a mere formality. Under the infection of the specific situation, let the students be on the scene, observe, perceive, operate and experience in the situation, so as to achieve better teaching effect.

#### 5. Conclusion

Biological literacy is the biological science knowledge, inquiry ability and related emotional attitudes and values that students need to make personal decisions in the future. Biology teaching is not only for examination, but also for application, so that students can flexibly use biological knowledge. Therefore, teachers should make scientific and rational use of situational teaching method in senior high school biology teaching, not only enhance students' interest in learning biology, but also promote students to actively build knowledge, guide students to develop good habits of scientific thinking and cultivate students' core literacy.

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