

## Research on the Interdisciplinary Teaching Methods between English and Biology in Junior High School

Mei Qi\*

*Xi'an Qujiang No. 3 Middle School, Xi'an, Shaanxi, China*

*\*Corresponding Author.*

**Abstract:** With the release of the New Curriculum Standard, interdisciplinary teaching is paid more attention. The purpose of this research study was to reveal the possibility of integration of English and biology in junior high school and explore the benefits of implementing such collaboration. This research includes following methods: literature analysis and case analysis. With the literature analysis, it can be found that there were many researches and discussions on the interdisciplinary teaching. More and more teachers and researchers try to find better ways to implement collaboration. The research is to show two ways of integration of English and biology. It can arouse students' curiosity and enthusiasm for learning both English and biology and it can also share insights and teaching strategies with middle school teachers for enhanced instructions.

**Keywords:** Interdisciplinary Teaching; English and Biology; Junior High School

### 1. Background

Nowadays, the topic related to “the integration of subjects in middle school” or “promoting interdisciplinary teaching” has been heatedly discussing for quite a long time. The importance of integration of subjects has been taken seriously by many researches and scholars. Following the issuance of the 2022 National Curriculum Standards for Compulsory Education, more and more teachers and researchers try to find better ways to set up interdisciplinary learning activities to cultivate students' core competencies. It has been emphasized in English Curriculum Standards for Compulsory Education (2022 Edition) that interdisciplinary theme-based learning activities need to be set up and it can strengthen the interrelationship between

disciplines, and improve students' ability to creatively solve problems by applying the language and interdisciplinary knowledge they have learned. Integrative teaching (e.g., interdisciplinary, multidisciplinary, cross-disciplinary, etc.) benefits middle-level learners as it potentially increases student engagement, motivation, and achievement. It provides learners with the opportunity to synthesize knowledge by exploring topics and ideas through multiple lenses. [1] As a junior school English teacher, many difficulties can be found during English teaching. For example, many students show little interest in English learning and they often feel it really hard to memorize lots of vocabularies. They have many grammatical errors and they can't understand what I taught in the English class because of lack of vocabularies. What's more, the themes of PEP textbooks can be divided into three main parts: people and the self, people and society, people and nature. In the context of humanity and nature, there are many contents related to biology like natural occurrences in our surroundings, common animals and traits of animals etc. So it will be better for students to understand deeply if the teacher gives some explanations about biological knowledge, which can also stimulate students' interest in English learning and biology study.

The purpose of this research was to reveal the possibility of promoting interdisciplinary teaching between English and Biology and share insights and teaching strategies with other middle school English teachers for enhanced instructions.

### 2. Literature Review

#### 2.1 The Importance of Interdisciplinary Teaching Across English Subject

If we try to google related researches according to following key words

“interdisciplinary teaching” or “interdisciplinary teaching across English subject” “promoting interdisciplinary teaching in junior high school”, it will be easily found there are many scholars or researchers have focused on this hotly debated topic.

First of all, many Chinese teachers or researchers have found that there are many issues and problems related to English teaching in middle schools, for example, students may easily lose interest and attention on the lesson because only lecture method is adopted and English teachers pay more attention on the analysis of texts. [2] For promoting interdisciplinary teaching across English subject and cultivating students’ core literacy in English subject, it is very necessary to have interdisciplinary teaching in English subject. [2,3]

What’s more, as M Demirel (2010) mentioned that the basic aim of today’s modern educational programs is to raise individuals - the inputs of programs- equipped with skills required by the society of knowledge. Individuals, who comprise the input, must acquire such basic skills as gathering knowledge related to various disciplines, bringing them together in an appropriate way, and meeting the needs with that knowledge in the processing period.[4] Many researchers and scholars believe that this integration of subject areas benefits both teachers and students, in that it is easier for students to see and make tangible connections between subjects, while teachers are building on one another’s ideas making them more focused, engaging, and supported. [5]. As David Stack & Nicholas Battey (2013) cited in their essay: “Interdisciplinarity, moreover, is not only better fitted for problem solving; it is transformative for its practitioners. Romm (1998), in particular, has stressed, ‘interdisciplinary practice is tied to reflexivity’: it forces the practitioner to reflect upon their own practice and opens up the possibility of new ways of thinking”. [6]

The growing body of the interdisciplinary teaching researches emphasizes that the integration of subjects can evoke students’ motivation and interest in learning. Also, it is possible to expand interest in one subject to another subject through interdisciplinary approach. What’s more, students’ interest can be improved by putting more weight on

interdisciplinary activities. [7] What’s more, as Al Hassan I B M mentioned that Teaching English language needs to integrate knowledge and contents. Designing a curriculum or a program that help bringing different disciplines homogeneously to better educate students. It requires syllabus designers to design a program that incorporates the appropriate aspects of history, religion, politics business, communication, and other sciences that meet the objectives of the content being taught.

## **2.2 The Practices of Interdisciplinary Teaching Across English Subject**

Zhao Wenjuan and Peng Liyuan have talked about some ways to design interdisciplinary learning activities for junior high students. They selected module 3 in the Grade 8 book 2 FLTRP English Textbook “Journey to space” as their research text. Because this module is related to knowledge for space, they try to connect this unit with physics by using knowledge of aerospace, the development of Chinese aerospace and scientists. By this way, students will have a better understanding of “journey to space”. Moreover, they pay more attention to different levels of students when they design learning objectives of interdisciplinary learning activities. [3]

Besides, many English teachers have tried to integrate English into other subjects. One of them called Wang Lu has tried to find connection between English and math. She used mathematic problems to help her students to think deeply about numbers which is the main topic asked her students to calculate in her English lesson.[8] Tang Yong has tried to connect English with Chinese. He translated some English names of food into Chinese to help students to understand and memorize English names. [9] Wang Miaoling selected unit 5 in PEP English Grade 9 as an example to show the integration of different subjects. She designed different questions for this unit and she asked her students to solve those problems by using what they have learned from other disciplines like Math, Geography, politics etc. She thinks her students can benefit a lot from those problem-solving tasks. [10]

## **2.3 Review and Commentary on Research**

The research on English interdisciplinary teaching in primary and secondary schools is mainly a record of teachers’ exploration in

classroom teaching or accidental use of interdisciplinary content in teaching. Wang Wencai lists four examples of English class, which is involved with Chinese, mathematics, and art respectively in *An Analysis of English Interdisciplinary Teaching in Junior High School* [11]. He unilaterally believes that English interdisciplinary teaching in junior high school is effective, but he doesn't discuss it systematically. In *A Brief Introduction to English Interdisciplinary Journal of Education, Humanities and Social Sciences PSHE 2024 Volume 29 (2024) 326 Teaching under the New Curriculum Standard*, Zhang Feng only lists the ideas of infiltrating history, politics, sports and aesthetic education into the English classroom, but stays at the frontline level of discussion [12]. Fan Hua points out in *Highlights of Foreign Language Teaching in the New Curriculum: Interdisciplinary Teaching* that under the new curriculum reform concept, book knowledge has been unable to meet the real needs of teachers and students, who need to understand the aspects of social life and natural science related to the teaching content, and make each subject a part of the construction of their macro knowledge system [13]. He just gives a simple statement in the theory that concerns the goal of quality-oriented education and ability cultivation through comprehensive study in various disciplines.

### **3. Research Study**

The research I designed was about the teaching practice of integration of English and biology. The research samples were from grade 7 students in junior high school which is also the school I worked in. Students are active and they are eager to know more about English and other subjects. But some of them have little interest in learning both of subjects and they also feel it very hard to understand some knowledge in biology. My colleagues and I (two biology teachers and one English teacher) were very interested in this topic and there were no previous teaching practice related to this aspect in our school. It is also because of my personal interest that I prefer to integrate English with biology on lessons. Biology, with its goal of exploring life and its essence, inherently belongs to a highly integrated field. By integration of biology and other subjects, it can foster creativity and

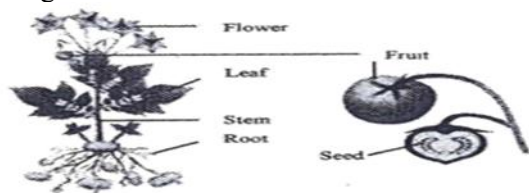
critical thinking among students, encouraging them to approach complex problems from multiple angles and utilize their interdisciplinary knowledge to devise innovative solutions. [11] So in this paper, I will focus on the integration of English and biology in junior middle school for grade 7. Because students in grade 7 have much more passion and be willing to face the challenge.

I hope by using this method my students can not only enjoy learning English but also exploring more in biology. We have designed some lessons. Here are two examples from our teaching lessons.

Here is one example about the integration of English and biology based on grade 7 students in junior high school. The teaching material is from unit 2 "What time do you go to school?" of the second book PEP edition English Go For It and Chapter 2 of the first book the PEP edition biology. The aim of this lesson is by reading the article about the different lifestyles between two teenagers, students can deeply understand the importance of health life and know how necessary if we live a healthy life. At the very beginning of the class, a list of different habits will be given to the students. Students need to work in pairs and circle all the healthy ones and explain their reasons. After that, teacher asks students to read the passage quickly and get the main idea of the passage. Then, students need to answer some questions related to the details about the passage. By this way, students are able to have a good understanding of healthy life. For post-reading, teacher will explain the importance of healthy life by connecting the knowledge of cancer which comes from biology. Students will be asked to read the part related to cells and cancer from textbook and they need to talk about their understanding of the importance of healthy life after discussion with their partner.

Take another lesson for example. The teaching material is from unit 3 PEP edition biology. The aim of this lesson is to get to know the structural hierarchy of a plant body. Before this lesson, a preview task will be given to students. They need to preview the given English names so that it can be easier for them to be familiar with both English names and Chinese names for different parts for a plant body. Then teacher will give students more tasks about knowing different parts for a plant body. Students need to work in groups to solve

the problems. For example, if they want to figure out following question, they need to match English names with each item correctly first. Then they need to use the knowledge from biology to solve the problems. The picture below is one question for students to fully understand the potato and tomato. The biology teacher asks students to study this picture by groups for several minutes first. Then students need to write down all the parts from the memory. For the homework, students are given the task to find out more pictures about different parts of the plant body, as show in Figure 1.



**Figure 1. Which One is the Re-productive Organ of the Potato?**

#### 4. Conclusion and Discussion

The research lasted for around one semester, we also designed questionnaires for both students and teachers to collect their opinions toward this study. So from the research result we could find a lot of students are fond of integration of English and biology. They were really happy to find out they could learn how to use English to describe different parts of the plant body. From the present study, it can be found that English teachers can gain confidence in the knowledge of the subject matter. In addition, biology teachers can gain more awareness of skills used for teaching English. Moreover, it can arouse students' curiosity and enthusiasm for learning both English and biology and it can also share insights and teaching strategies with middle school teachers for enhanced instructions.

Besides, we have adopted scaffolding instructions in our class. At the very beginning of the class, we paid a lot of attention to design activities to stimulate students' existing knowledge. For example, we have designed word games to test students' knowledge related to today's topic.

But there are still many things that we need to do if we want to promote this kind of teaching methods. Teachers from different subjects barely have enough time to work together. Teachers need more time work together to find

out which parts can be integrated and there are few resources about the integration of different subjects.

#### References

- [1] Moser K M, Ivy J, Hopper P F. Rethinking content teaching at the middle level: An interdisciplinary approach. *Middle school journal*, 2019, 50(2): 17-27.
- [2] Wang Wei, On the implementation Strategies of Interdisciplinary Teaching in Junior High School English. *English Journal for Middle School Students*, 2024, (22): 73-74.
- [3] Zhao Wenjuan, Pen Liyuan. An Initial Exploration of Holistic Unit Instructional Design for Junior High School English from an Interdisciplinary Perspective. *English Learning Journal*, 2024, (07): 52-56.
- [4] Fang Xiaoli. The Existing Problems and Countermeasures of Interdisciplinary Teaching in High School English. *Journal of Educational Sciences*, 2024, (24): 92-94.
- [5] Wang qun. Research on the Design of Interdisciplinary Theme-Based Learning in Junior High School English from the Perspective of Core Competencies. *Qu*, 2024.
- [6] David Stack & Nicholas Battey (2013) Reflections on Designing a Biology/ Humanities Interdisciplinary Module, *Bioscience Education*, 21: 1, 64-74.
- [7] Michelsen C, Sriraman B. Does interdisciplinary instruction raise students' interest in mathematics and the subjects of the natural sciences?. *ZDM*, 2009, 41: 231-244.
- [8] Wang Lu. The instructional design for interdisciplinary theme-based learning in junior high school English and mathematics. *Guangdong Education*, 2024, (06): 57.
- [9] Tang Yong. Research on the Interdisciplinary Teaching Parts for Junior High School English and Chinese under the New Curriculum Standards. *Famous Teachers Online*, 2024, (15): 67-69.
- [10] Wang Miaoling. Exploration and Reflection on the Practice of Interdisciplinary Theme-Based Learning in Junior High School English—— take Unit 5 “What are the shirts made of?” from PEP

- grade 9 English for example. *English on Campus*, 2024, (17): 109-111.
- [11] Wang Wencai, An Analysis of English Interdisciplinary Teaching in Junior High School. *Jilin education*, 2013(22): 115.
- [12] Zhang Feng, In A Brief Introduction to English Interdisciplinary Teaching under the New Curriculum Standard. *Neijiang Technology*, 2007(3): 138.
- [13] Fan Hua, Highlights of Foreign Language Teaching in the New Curriculum: Interdisciplinary Teaching. *Journal of Liaoning Administration College*, 2007(5): 154-155.