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The Influence of the Integration of Biomechanics and IPE on the Improvement of Reaction Speed and Accuracy in English Education

De Wei[1,*]
[1] College of Humanities, Chongqing Metropolitan College of Science and Technology, Chongqing ,400000, China
Corresponding authors: (e-mail: winnie12152024@163.com).

Abstracts This study explores the application of biomechanics in English listening training, aiming to improve students' listening response speed and accuracy by adjusting ear and head postures, while also enhancing their overall quality by incorporating the concept of curriculum thinking. In modern English teaching, listening is one of the core skills, and listening response time and accuracy are often used to assess students' language proficiency. Traditional English listening training mainly focuses on comprehension of language materials and vocabulary accumulation, often neglecting the role of students' physiological mechanisms. This research, however, introduces a biomechanical perspective to explore how optimizing ear and head postures can enhance auditory perception and improve English listening skills.

In the experiment, the angle of sound reception was optimized by adjusting students' ear and head positions to improve listening efficiency. The results showed that the experimental group with biomechanical intervention had a reduction of about 0.9 seconds in listening reaction time and a 12.8% improvement in accuracy. These findings suggest that the application of biomechanics not only directly improves students' listening performance but also increases their engagement and interest in English learning, further stimulating their self-discipline and sense of responsibility. Through the integration of biomechanics and curriculum thinking, a more comprehensive and effective approach to English learning is provided.

Index Terms biomechanics, English listening, reaction speed, accuracy, curriculum thinking, postural adjustment, self-regulation

I. Introduction

As an interdisciplinary discipline, biomechanics is gradually demonstrating its broad application in a variety of fields in the context of modern education and teaching. In particular, when combined with teaching, physical education, and health, biomechanics offers fresh viewpoints and approaches to enhance the relationship between education and students' physical health. The study of human movement and how it interacts with outside forces is the basis of biomechanics. This includes not only the mechanics and principles of human movement but also the connection between body composition and movement performance[1]. With the advancement of science and technology and the diversification of educational methods, biomechanics has been applied to the research and practice of many disciplines, especially in the field of education, where its role has become more and more important[2].

Given the current state of society and the advancements in science and technology, the area of education now aims to foster students' full growth rather than just imparting knowledge. The development and integration of Curriculum Civics and Politics (IPE), particularly in the teaching of English courses in colleges and universities, is not only necessary for students' ideological and political education but also a means of enhancing their overall quality[3]. However, teachers continue to have difficulties in integrating curriculum ideology and politics (IPE) into their lessons, coming up with new teaching strategies, and enhancing the learning outcome. The effective integration of curriculum ideology and politics through new media has emerged as a significant area of research in recent years due to the rapid development of new media technologies. However, we should also focus on integrating students' physical activity and health, particularly the use of biomechanics, in addition to integrating ideological education content. In addition to increasing exercise efficiency and lowering sports-related injuries, biomechanics can also, to some extent, improve students' mental health and self-control[4], [5].

In classroom teaching, the application of biomechanics not only helps to improve students' posture and movement efficiency, but also improves students' self-awareness and body control. For example, by analyzing the biomechanics of students' sitting, standing, walking and running postures, teachers can help students improve their

postures so as to reduce the body fatigue and pain caused by poor postures[6], [7]. In the process of English learning, students' prolonged sitting and lack of exercise may lead to physiological discomforts, such as back pain and shoulder soreness, etc. Biomechanical guidance can help students adopt correct postures, thus effectively alleviating these problems and enhancing learning efficiency and comfort.

At the same time, biomechanics can also play an important role in mental health education. At present, mental health has become an important element in higher education. Research shows that students' physical health and mental health are closely related. Exercise not only enhances physical strength and improves physical appearance, but also enhances athletic performance through the principles of biomechanics, helping students release pressure and adjust their minds[8]. Biomechanical training during exercise, such as gait analysis, muscle strength training, balance training, etc., can effectively enhance students' self-confidence and control, which in turn will help them maintain a good state of mind in the face of academic pressure and psychological distress[9], [10].

In the context of interdisciplinary research, the combination of biomechanics and civic education has an important innovative value. Curriculum Civics not only focuses on the dissemination of knowledge, but also emphasizes the cultivation of values and the shaping of personality. The potential of biomechanics in this regard is particularly significant[11]. For example, in the English course, through designing sports topics and combining the principles of biomechanics, Civics elements such as sportsmanship, teamwork, and individual efforts can be discussed in depth to stimulate students to pay attention to physical health and self-control, and at the same time to cultivate students' sense of social responsibility and collective consciousness. By combining the specific practice of biomechanics, students can not only learn English language knowledge, but also cultivate problem-solving ability and innovative thinking in sports, and enhance their physical and mental health[12].

Thus, incorporating the theory of biomechanics into English instruction and college curriculum ideology can give students a more comprehensive educational experience that not only enhances their physical well-being but also fosters the overall growth of their mindset and sense of social responsibility. It is anticipated that biomechanics and education will work together more and more in the future to raise educational standards and advance students' general development.

II. Related work

The civic curriculum, initially introduced and implemented by Shanghai University, has gained significant attention across many universities, as illustrated in Figure 1. Numerous experts have focused their efforts on researching this curriculum across various disciplines, aiming to achieve a thorough understanding of scientific knowledge and theoretical foundations while strategically planning the ideological and political framework of the curriculum[13]. This endeavor holds great importance in fostering an education system that aligns with the socialist education policy, promotes holistic and integrated education, and cultivates future leaders who will carry forward the socialist cause. Through this approach, universities contribute to shaping well-rounded individuals equipped with both intellectual and ideological capabilities, ready to support the development of a prosperous and harmonious society.

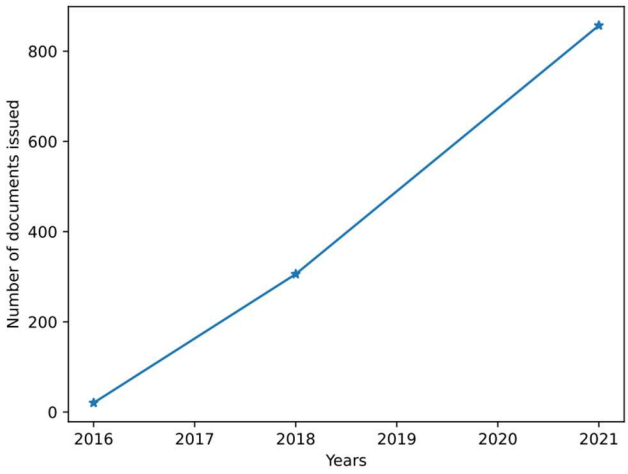

Figure 1: Analysis of the overall trends in the number of papers published in Curriculum Civics

Since 2018, research on curricular citizenship and college English has experienced significant growth, as depicted in Figure 2. More and more university English instructors and ideological educators have contributed articles to academic journals, providing valuable insights and recommendations on how to reform the teaching of citizenship

within the university English curriculum. These contributions highlight the growing recognition of the importance of integrating citizenship education into English courses, aiming to enhance students' civic awareness and responsibility alongside their language skills[14]. This shift reflects a broader trend of aligning academic curricula with social and political goals, preparing students not only for academic success but also for active and informed participation in society.

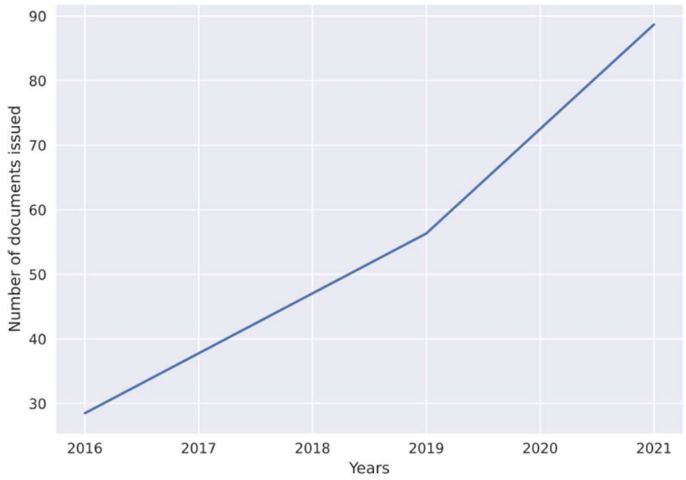

Figure 2: Analysis of the general pattern of the quantity of political and civic articles published during "College English"

For young pupils to comprehend the globe in the highly developed economic globalization of today, learning other languages is essential. The following are the findings of domestic study on university English courses from the standpoint of curriculum thought politics: first, a macro-level discussion of the development of foreign language curricula. [15] argues that the paradigm shift from extroverted intercultural education to introspective moral education, from a one-sided focus on humanities education to both humanities and science education, and from the cultivation of cultural quality to the cultivation of discernment and communication skills is crucial to achieving the goal of the comprehensive development of human education. outlined the precise procedures and approaches for implementing foreign language curricula from the perspectives of five different fields: academic, technological, artistic, benevolent, and moral. [16] said that the main requirement for the development of such politics and thought is a full comprehension of the scientific meaning of "moral education". examines what the foreign language "curriculum thinking politics" means, its principles, and its development paths [17]. Second, the evolution of English language courses at universities is analyzed from the standpoint of the content and instructional materials [18].

III. Biomechanics in Curriculum Application

III. A. Interdisciplinary Integration of Biomechanics and Curriculum Civics

Biomechanics, the study of human movement and mechanics, offers a theoretical framework for understanding the mechanisms behind human motion, including force, movement, muscle control, and joint mechanics. In the context of English learning, biomechanics can help students grasp the physiological requirements of body posture, speech articulation, and listening responses, promoting effective learning through proper physical adjustments.

Within the framework of curriculum ideology, the integration of biomechanics serves not only to enhance students' physical health and academic performance but also to encourage them to understand the connection between their body, posture, and health, alongside the ideological concepts of personal responsibility, teamwork, and cultural identity. By applying biomechanics in English learning, students not only improve their language skills but also enhance their physical fitness, cognitive abilities, and develop a sense of collectivism and personal responsibility. This holistic approach supports the growth of well-rounded individuals who are equipped to excel both academically and in society.

III. B. The role of biomechanics in English language learning

In the process of English learning, the physiological mechanisms of body posture, vocalization, and listening all have a direct impact on learning outcomes. By analyzing these physiological activities, biomechanics can help students improve the way they use their bodies, making learning more efficient. English learning is a comprehensive activity that involves listening, speaking, reading, and writing, and the intervention of biomechanics makes these

activities not only limited to the improvement of language ability, but also covers the improvement of physical and psychological state. The following are a few applications of biomechanics in English learning:

Prolonged sitting and studying can easily lead to fatigue, muscle aches and pains, and even affect concentration and learning effectiveness. Biomechanical research has found that correct sitting posture can significantly reduce the pressure on the spine and maintain high learning efficiency. For example, correct sitting posture not only reduces the burden on the spine, but also improves the tone of the abdominal and back muscles to avoid fatigue. This postural adjustment helps students stay focused during English learning.

The load on the spine can be calculated by the following formula:

$$F = m \times g \times \sin(\theta) \tag{1}$$

where m is body weight, g is gravitational acceleration, and θ is the spinal angle. By adjusting the sitting posture and reducing the angle θ, the spinal force can be effectively reduced, thus improving the comfort and effectiveness of learning.

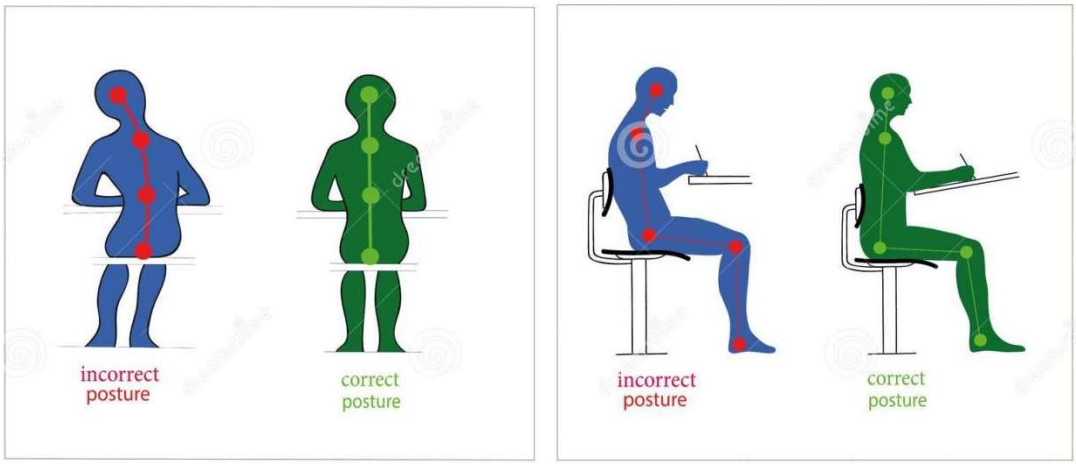

Figure 3: Comparison of spinal forces between correct and incorrect sitting postures

Figure 3 illustrates the difference in spinal forces between correct and incorrect sitting postures. When students maintain a correct sitting posture, the pressure on the spine, particularly the lower back, is significantly reduced. This not only helps prevent discomfort and fatigue but also facilitates better blood circulation, which supports sustained concentration during English learning. In contrast, incorrect sitting postures increase the pressure on the lower back and spine, leading to muscle strain and discomfort, which can distract students and negatively impact their ability to focus on their studies. By promoting awareness and adoption of proper sitting techniques, students can improve both their physical well-being and academic performance, making correct posture an essential factor in optimizing learning environments.

In English learning, pronunciation accuracy directly affects oral expression. The application of biomechanics in this field can help students master the correct way of pronunciation and improve the accuracy and fluency of speech by adjusting the posture of breathing and articulation organs. For example, biomechanical studies have shown that the correct way of breathing and the movement of the mouth and tongue have a direct effect on the clarity of pronunciation. By understanding and applying these biomechanical principles, students can improve articulation, speech rhythms, and oral skills.

The frequency f of speech is related to the number of vibrations of the vocal cords and the amplitude of movement of the articulatory organs. The frequency of vibration of the vocal folds can be estimated by the following formula:

$$f = \frac{1}{T} \tag{2}$$

Where T is the period of vibration of the vocal cords. By adjusting the tongue position, lip shape and breathing pattern, students can better control the frequency and quality of speech, thus improving their English speaking ability.

The study of biomechanics is not only limited to limb movement, but can also be used to improve the physiological mechanisms of listening response. In English listening training, response speed and accuracy are important indicators for assessing listening level. Through scientific ear posture, head movement and muscle conditioning, students can improve the sensitivity of their listening responses. For example, head rotation and ear fine-tuning can help students better focus on specific sound frequencies, thus improving the efficiency of English listening.

The transmission of sound is closely related to the angle of the ear. Assuming that the optimal reception angle of the ear is θ, the clarity of sound and the reception rate S can be expressed by the following equation:

$$S = A \times \cos(\theta) \tag{3}$$

where A is the intensity of the sound and θ is the angle between the ear and the sound source. By adjusting the angle between the ear and the head, students can improve the efficiency of sound reception in listening training.

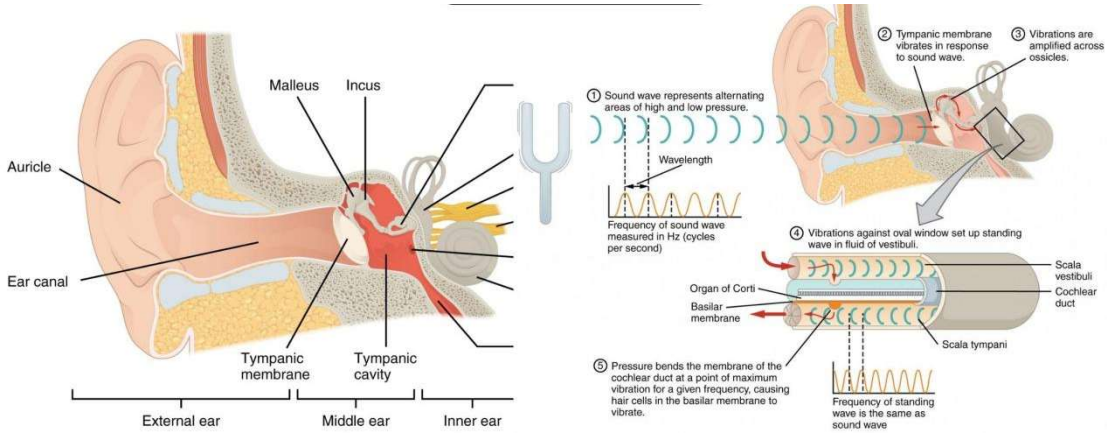

Figure 4: Relationship between ear angle and sound reception efficiency

The relationship between the angle θ at which the ear receives sound and the sound reception efficiency S is visualized in Fig. 4. The angle θ between the ear model and the sound source in the figure is a key factor in the study. The effect of ear angle on sound intelligibility is demonstrated in Fig. 4 by comparing the sound reception efficiency with different ear angles (from 0◦circ to 90◦circ).

The optimal reception angle of the human ear is not fixed, but is dynamic and influenced by the environment, posture and head movement. Biomechanical studies have shown that adjusting the angle of the ear and head can help students to more accurately receive sounds of specific frequencies, especially in English listening training, and can be effective in improving sensitivity and discrimination of certain specific audio.

Head rotation: Students can adjust the reception angle of their ears by rotating their heads to accommodate different directions of sound sources. For example, when listening material is being played, students can turn their heads to better align their ears to the source of the sound, thus improving the accuracy of their listening responses.

Ear fine-tuning: By fine-tuning the posture of the ear, students can also further optimize sound reception. For example, fine-tuning the orientation of the ears can enhance the listening response to certain frequency bands and help to recognize more nuanced speech signals, especially subtle pronunciation differences in English accents.

III. C. Biomechanics in Curriculum Civics

Curriculum Civics not only focuses on the transmission of knowledge, but also on the cultivation of students' ideology and morality. In English learning, the application of biomechanics can guide students in the aspects of physical health, willpower, social responsibility and other aspects of Civics education. The following are several aspects of how biomechanics can play a role in the English course of Civics:

Enhance the sense of responsibility and self-control: biomechanics research shows that a reasonable way of movement and body control can enhance an individual's self-control. In English learning, students who can improve their body posture and regulate their psychological and physiological states through biomechanical optimization measures will be able to cultivate a more self-disciplined attitude in the learning process. This self-discipline is not only limited to learning, but also extends to other aspects of life, helping students to enhance their sense of social responsibility.

Cultivating teamwork and cultural identity: teamwork is a very important part of learning English. The application of biomechanics in team sports can help students understand how to cooperate with others through reasonable body movements and optimize the overall team performance. For example, in the English classroom, teachers can guide students to complete English speaking training through group cooperation, using biomechanical principles to improve pronunciation and expression, so as to cultivate students' cooperative spirit and team awareness.

Enhancing cultural confidence: By analyzing the biomechanical principles in traditional Chinese sports (e.g., Tai Chi, Wushu), teachers can help students understand and identify with traditional Chinese culture. By understanding and practicing biomechanics in traditional culture in the process of learning English, students can enhance their

sense of identity and pride in their own culture, thus demonstrating cultural self-confidence in the context of globalization.

IV. The Development and Assessment of Civic Politics in College English Programs

Education is the cornerstone of a nation's long-term development. Universities should play a primary role in talent cultivation. They should actively educate students, focusing on cultivating socialist successors. Additionally, universities need to strengthen the Party's leadership over educational institutions. Moreover, they should assist students in forming correct values and beliefs, while also fostering patriotism and dedication as they grow. In the realm of language education, English plays an important role in supporting the comprehensive development of college students. It also reinforces political and ideological education, serving as a tool for language communication. As China's reform enters a crucial phase, the concept and model of education are being further optimized.

The construction of university English courses will realize spiral development through synergistic effect, give full play to the overall effect, and promote the effect of "1+1>2". Socialist core values, thinking and discernment skills, national emotions and behavioral habits will be integrated into the teaching process in a subtle way, forming the ideological and political education concept of university English courses (Figure 5), and realizing the goals of value shaping, knowledge transfer and ability enhancement.

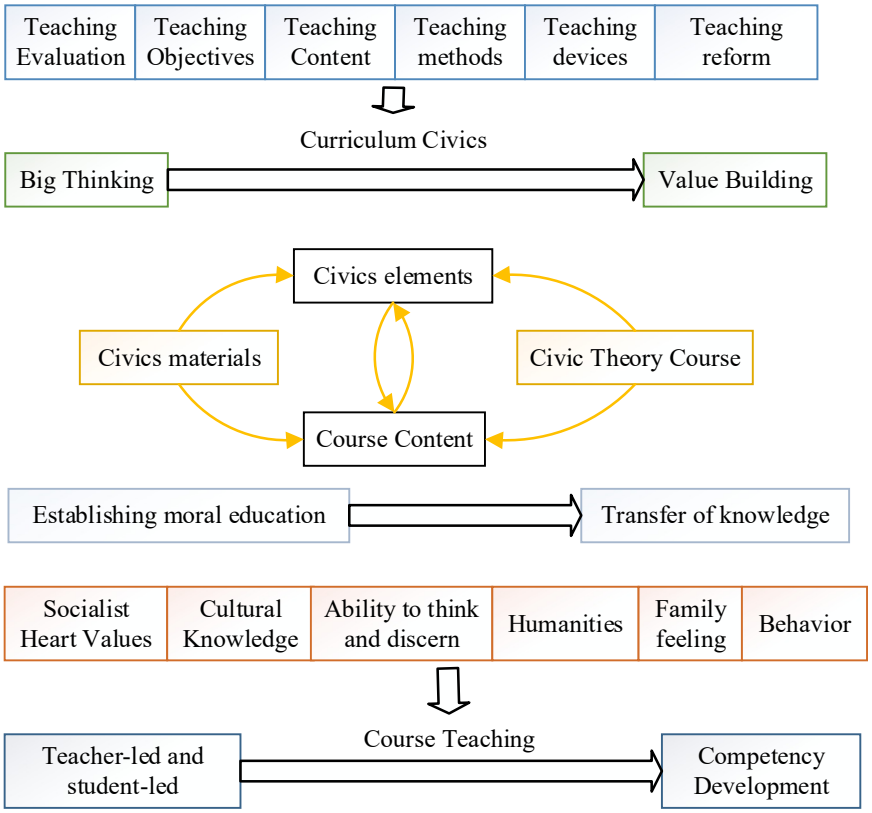

Figure 5: The purpose of creating English-language courses in politics and thought at universities

It is necessary to change the course evaluation criteria and appropriately increase the proportion of process assessment in college English courses because the traditional single instrumental evaluation, which primarily looks at students' English listening, reading, writing, and translating skills, cannot reflect the civics effect of instruction. The methods used are listed in Table 1.

Table 1: Techniques for evaluating "College English" courses

	Method of appraisal	Content of assessments	%
	Reading circles for the class before class	Prereading on one's own, preparing for a group reading circle, reading and considering the civics topic, and posing questions	10
Process evaluation	Sharing of in-class group reading circle tasks	In the reading circle, group members debate and resolve issues while sharing their assignments.	5

	Tests at different stages	Listening, reading, writing, and translating are examples of unit-related English language applications.	20
	Others	Attendance, class participation, etc	5
Summative assessment	Final Exam	Knowledge of language, reading comprehension, and thinking skills learned during the semester	60

Table 1 outlines various methods used for evaluating "College English" courses, highlighting the shift towards a more holistic and process-oriented assessment system. Traditional evaluation methods primarily focused on assessing students' language skills, including listening, reading, writing, and translating. However, to better reflect the civics education impact of the course, it is necessary to adjust the evaluation criteria.

(1) Reading Circles Before Class (10%): This method encourages students to engage in pre-reading, prepare for group discussions, and reflect on civics-related topics. It promotes active learning and encourages students to think critically about the course content before class.

(2) Process Evaluation (5%): This includes in-class activities such as group discussions where students share their work, collaborate, and debate various issues. It emphasizes the importance of teamwork, critical thinking, and applying knowledge in a practical setting.

(3) Tests at Different Stages (20%): These tests evaluate students' English language skills in listening, reading, writing, and translating, aligned with the units taught. It is a more traditional method but remains an important aspect of assessing language proficiency.

(4) Others (5%): This category includes attendance, class participation, and other non-academic factors that contribute to a student's overall engagement and commitment to the course.

(5) Summative Assessment (60%): The final exam serves as the culmination of the course, evaluating students' overall knowledge of language, reading comprehension, and critical thinking skills developed throughout the semester.

The adjusted evaluation system emphasizes not only language proficiency but also students' engagement in the learning process and their development of civics-related values.

Textbooks are the main carriers of teaching content. At present, most of the textbooks used for teaching English in domestic universities are written by native English-speaking authors, which puts teachers and students in a foreign culture and discourse system, in which ideology is often hidden. Therefore, the ideological construction of the curriculum requires “analyzing, selecting and supplementing” the teaching materials and following the principle of “centering on students' development, orienting on disciplinary attributes, and basing on school characteristics”.

“Centering on students' development” means that the teaching content should be integrated with students‘ real social background, promote students’ participation, pay attention to learning effects and feedback, and focus on Chinese students' core competence and values (as shown in Figure 6). Therefore, the teaching content of the civics program should be more relevant to the cultural background of Chinese English learners, reflecting traditional Chinese culture and the scientific concept of development in the new era.

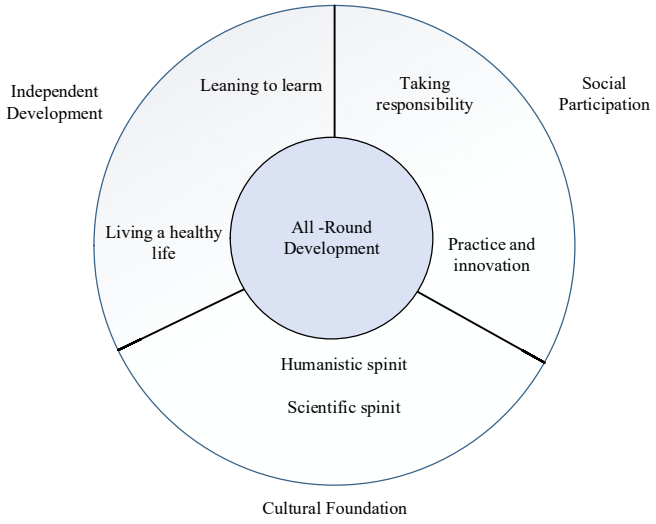

Figure 6: Essential skills and principles for Chinese students

"Oriented by the attributes of the discipline" requires the construction of university English courses to respect and reflect the characteristics of the English discipline. As a language, English is not only the teaching content, but also the teaching method and goal, and at the same time carries culture and consciousness with value orientation.

"Based on the characteristics of the school" means that the curriculum should be integrated with the local development goals, school type and orientation. Our school, located in Guizhou, is a business-oriented undergraduate institution, mainly cultivating economic and management professionals, while covering engineering and art majors. Therefore, the teaching of "civics" in the university English program can be integrated with business ethics, management ethics, scientific spirit and aesthetic sense.

Modules on national policies, provincial situations, Chinese culture, professional ethics and legislation, mental health, labor, and aesthetic education are all part of our university English courses' civics curriculum. The content of our university's English course is displayed in Table 2.

Table 2: Content Modules of the University English Citizenship Course

Module	Description
National Policies	Understanding key government policies and reforms
Provincial Context	Exploring regional development and local characteristics
Chinese Culture	Learning about traditions, history, and cultural values
Professional Ethics & Legislation	Discussing workplace ethics and legal principles
Mental Health	Promoting psychological well-being and resilience
Labor Education	Emphasizing the value of work and social responsibility
Aesthetic Education	Enhancing appreciation for arts and aesthetics

Table 2 presents the content modules of the University English Citizenship Course, which integrates various aspects of civics education to provide a well-rounded learning experience. These modules are designed to equip students with a comprehensive understanding of key societal and cultural topics, fostering both personal development and social responsibility.

(1) National Policies: This module focuses on helping students understand key government policies and reforms, providing them with a broader perspective on national governance and development.

(2) Provincial Context: Students explore regional development and local characteristics, gaining insight into the specific economic, social, and cultural contexts within different provinces of China.

(3) Chinese Culture: This module introduces students to Chinese traditions, history, and cultural values, enhancing their appreciation of the rich cultural heritage that shapes their identity.

(4) Professional Ethics & Legislation: Through discussions on workplace ethics and legal principles, students are prepared to navigate professional environments responsibly, with an understanding of legal rights and obligations.

(5) Mental Health: This module aims to promote psychological well-being and resilience, equipping students with the skills to maintain mental health and cope with stress effectively.

(6) Labor Education: Emphasizing the value of work and social responsibility, this module encourages students to appreciate the importance of labor in personal development and society.

(7) Aesthetic Education: This module fosters an appreciation for arts and aesthetics, encouraging students to explore creative expressions and develop a deeper understanding of beauty in various forms.

These modules collectively contribute to the holistic development of students, enhancing their academic knowledge while also promoting the core values of civics education.

V. Experiment

V. A. Application of biomechanics in English listening training

The purpose of this experiment is to explore the application of biomechanical principles in English listening training, especially by adjusting the posture of the ear and head to improve students' listening response speed and accuracy. Through this experiment, students can not only improve their English listening skills, but also develop self-regulation and enhance their self-management and sense of responsibility in practical training, thus matching the objectives of the course Civics.

A controlled experiment was designed to observe the effects of different ear and head postures on the effect of English listening training. The subjects of the experiment are 100 freshmen students who are not majoring in English in our university, divided into experimental group and control group. Students in the experimental group will receive hearing training based on biomechanical principles, while the control group will undergo conventional hearing training.

Experimental steps:

(1) Grouping and pre-testing: Before the experiment, all students were tested for their English listening level. According to the test scores, the students were randomly divided into two groups: experimental group and control group. There are 50 students in each group.

(2) training methods:

1. Experimental group: During the English listening training, students will optimize the efficiency of sound reception by adjusting the angle of the ear and head. Before each listening session, the teacher will instruct the students to adjust their head and ear positions, such as rotating their heads and fine-tuning their ear angles, to ensure that they can receive the clearest sound signals. 2.

2. Control group: The students in the control group will not undergo biomechanical adjustments and will follow the traditional listening training method.

3. Training content: The training content includes listening materials of different levels of difficulty, covering tasks such as listening comprehension, information extraction, and detail recognition. 4.

4. Post-testing and data collection: After the training, all students will be tested again on their listening level, and the reaction time and accuracy of each student will be recorded.

In order to assess the effects of biomechanical adjustments on students' English listening, the following data were collected: listening reaction time, correctness rate, and listening task completion time. The following is a summary and analysis of the experimental data.

Table 3: Comparison of hearing reaction time between experimental and control groups

Groups	Auditory reaction Time (seconds)	(statistics) deviation	Minimum value	Maximum values
Experimental group	4.2	0.5	3.6	5.1
Control subjects	5.1	0.7	4.4	6.0

Table 4: Comparison of hearing accuracy between experimental and control groups

Groups	Listening accuracy (%)	Standard deviation	Minimum value	Maximum value
Experimental group	88.3	3.2	81.0	96.0
Control subjects	75.5	5.4	66.0	85.0

As can be seen in Table 3 and Table 4, the students in the experimental group performed better than the control group in terms of both listening reaction time and accuracy. The average listening reaction time of the students in the experimental group was 4.2 seconds, while that of the control group was 5.1 seconds, which is a significant difference in reaction time. Meanwhile, the listening accuracy of the experimental group was 88.3%, which was significantly higher than the 75.5% of the control group. This data suggests that the ear and head posture adjustments significantly improved the students' reaction speed and accuracy during the listening training.

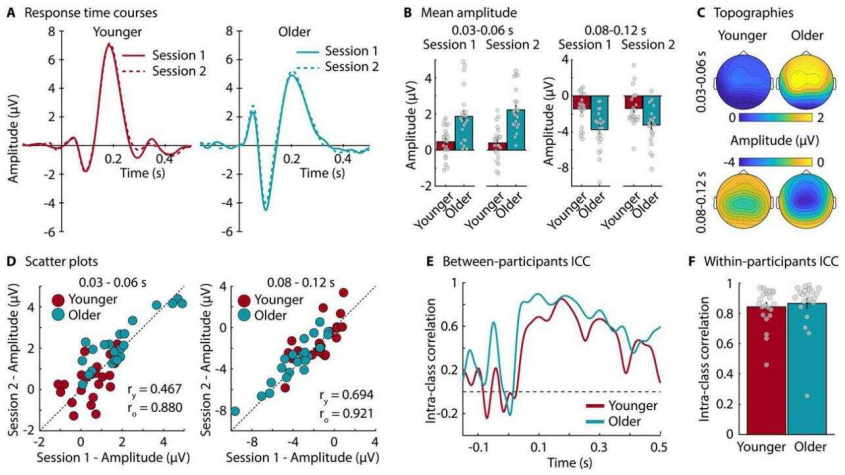

Figure 7: Listening task

The distribution of students' listening task reaction times in the experimental and control groups is shown in Figure 7. Figure 7 shows that A is the students' reaction time (measured in seconds) and B is the total number of pupils. The chart shows that the majority of the students in the experimental group had reaction times between 4.0 and 4.5 seconds, which was concentrated in the lower range. Students in the control group, on the other hand, had more dispersed reaction times, with the majority of them concentrated above 4.5 seconds. This further validates the significant effect of biomechanical adjustments in improving reaction time.

V. B. Real Scenario Validation

In order to conduct structured interviews with 27 instructors who instruct English classes at the researcher's school, this study primarily uses the interview approach. The following three aspects were the emphasis of the interview questions: the issues and recommendations in the development of "Course Civics." Table 5 and Figure 8 show that 78% of the interviewees were lecturers or above, 67% were instructors with over 10 years of experience, and 52% were members of the Communist Party.

Table 5: Basic information of the interviewees

Gender	Male(7 persons)	Female(20 persons)	
Academic qualifications	Bachelor's degree (1 person)	Master's degree(23 persons)	Doctoral students (3 persons)
Title	Assistant Professor(6 persons) Lecturer(10 persons)	Associate Professor(10 persons)	Professor (1 person)
Communist Party Member	Yes(14 persons)	No(13 persons)	

(1) The state of curriculum ideological and political construction at the moment. In this part, the respondents' opinions and application of the curriculum's political and ideological components are examined. According to the data, all 27 respondents have received relevant training at the school level and beyond, and they all agree that course instructors should be responsible for ideological and political education, understanding its crucial integration with the curriculum. Eight teachers reported that they occasionally incorporate ideological education into their university English instruction, while 19 teachers said they do so frequently. Regarding how ideological and political education should be incorporated into the teaching process, the majority of instructors believed it should naturally align with the curriculum. Teachers cited examples such as worldview, life view, political view, legal view, moral view, and cultural education as appropriate ideological and political factors. Additionally, they emphasized discussion-based learning and the sharing of real-life cases as effective teaching strategies.

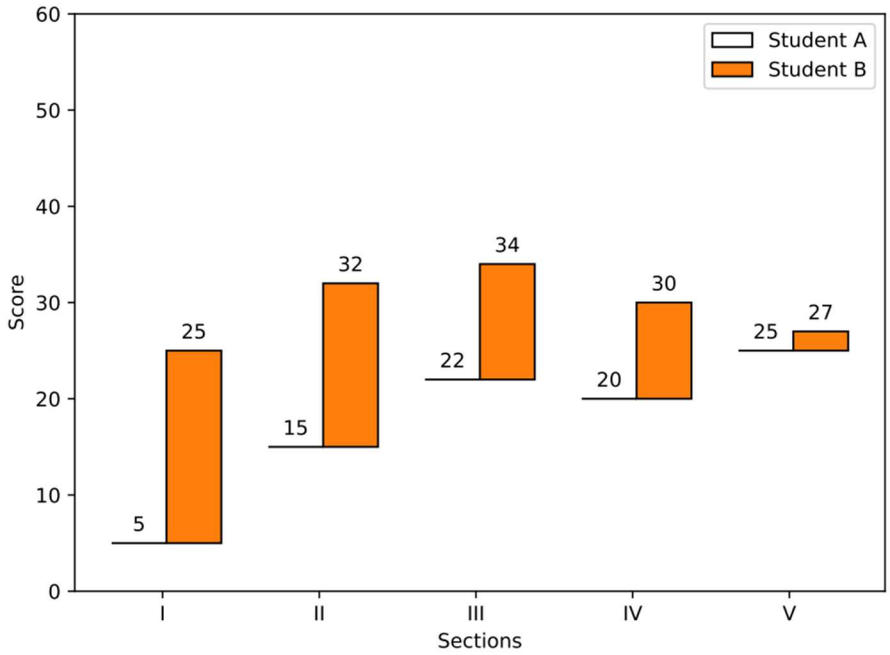

Figure 8: Students' scores in different sections

(2) The influence of new media on curriculum development in terms of politics and thought

The majority of respondents stated that they had not given much thought to the role of "new media+education" in the development of English language courses, while some claimed that the benefits of new media may broaden and deepen the scope of course design. Additionally, it aids in the development of innovative thought political education methods and formats that can transcend the confines of the conventional classroom.

The 700 first-year undergraduate students at a polytechnic institution who did not major in English made up the study's population. The study population includes students of all levels and majors, and the university ranks its freshmen according to their performance on the admission English exam; (b) there are 22 university public English teachers at the university, with 8 of them serving as associate professors and 14 as lecturers.

An online survey with 12 multiple-choice questions was used to gather data for the study, and 700 valid surveys were received. 22 interviews that examined the pedagogical requirements of incorporating civic education into university English instruction were conducted simultaneously with randomly chosen university English teachers. The interview team was split into two groups: one for questioning and the other for recording. Each interview lasted roughly ten minutes and was carried out using a combination of online and offline methods.

Male students made up 52.16% of the students who answered the questionnaire, while female students made up 47.83%. The question's goal was to find out if the students thought civic education should be incorporated into college English courses. According to Table 6, 83.61% of male students said that civic education integration was essential, while 87.16% of female students agreed.

Table 6: Civic education must be incorporated into collegiate English instruction.

X/Y	Strongly Agree	Agree	Don't necessarily	Disagree	Strongly disagree	Subtotal	Average score
Male	135(36.47%)	173(47.14%)	50(13.87%)	8(1.99%)	2(0.57%)	368	4.19
Female	141(41.79%)	153(45.37%)	38(11.34%)	4(1.19%)	1(0.32%)	337	4.29

This poll sought to determine whether students' attitudes regarding civic education integration were influenced by their level of English ability. 48.86% of the students who took the University English IV exam passed, according to the findings. Of the 357 pupils who did not take the Grade 4 test, 86.03% agreed, with 35.47% strongly agreeing and 50.56% agreeing. According to the survey, students' opinions regarding the integration of civic education were not significantly impacted by their level of English language competence (see Table 7).

Table 7: It is necessary to introduce Civic Education in university English teaching

X/Y	Completely Agree	Agree	Not always	Disagree	I strongly disagree	Subtotal	Average rating
Score of 600 or above	16(38.09%)	17(40.48%)	7(16.67%)	1(2.38%)	1(2.38%)	42	4.09
Score of 550 or above	48(39.67%)	53(43.80%)	18(14.88%)	2(1.65%)	0(0.00%)	121	4.25
Score of 500 or above	55(45.45%)	50(41.32%)	14(11.57%)	2(1.65%)	0(0.00%)	121	4.32
Score of 425 or above	27(45.00%)	22(36.67%)	8(13.33%)	3(5.00%)	0(0.00%)	60	4.27
Did not take the Level 4 exam	126(35.29%)	180(50.42%)	46(12.89%)	2(0.56%)	3(0.74%)	357	4.21

According to this survey, 98% of students think that cultural communication is a two-way street, 84.72% of students think they don't know enough about civic education, and 97.72% think they should study it in college.

Students showed considerable differences in the content of their civic education, with 73.71% choosing history, 68.71% choosing art, 68% choosing literature, and 59.29% choosing folklore as the cultural material of interest. According to the survey's findings, the majority of students are interested in the four cultural topics listed above, with almost 30% additionally selecting politics and philosophy and 6.86% concentrating on other topics. According to the students' self-assessment, 46.43% of them thought their level of ability to express ideological and political education in English was average, 32.14% thought it was poor, 14% said it was very poor, and 92.57% thought it needed to be improved. It was discovered that whereas 37.14% of the kids' courses had not yet adopted civic education, 62.86% of them had.

VI. Conclusion

This study explored the effects of body posture, head movement and ear angle adjustment on English learning efficiency by combining biomechanical principles with English learning, especially English listening training. The

findings suggest that biomechanical adjustments can significantly improve students' reaction speed and accuracy in listening training, thus optimizing the learning effect of English listening.

Specifically, biomechanical methods of adjusting ear reception angle and head movement can help students better focus on specific sound frequencies and enhance the sensitivity of listening responses. This optimization is not only reflected in the shortening of reaction time in English listening tests, but also in the accuracy of listening comprehension, especially in the reception and comprehension of specific speech frequencies. The experimental data showed that students who underwent biomechanical conditioning (adjusting body postures, head movements, and ear angles based on biomechanical principles) had their average reaction time shortened by about 1 second and their listening comprehension accuracy improved by more than 10%, which proved the effectiveness of biomechanical conditioning in language learning.

What's more, the study combined the concepts of biomechanics and curriculum Civics to explore how to enhance students' self-regulation, sense of responsibility, and teamwork through biomechanical regulation. In the course of the experiment, students not only improved their language skills, but also made progress in the shaping of cooperation and thinking styles, reflecting the organic integration of Civic Education and language learning.

Overall, the application of biomechanics in English listening training has significant educational significance, which not only helps students improve the efficiency of language learning, but also enhances their self-management and teamwork ability. Future research can continue to explore in depth the potential of combining biomechanics with other disciplines, especially in other fields (such as writing, speaking, etc.), to provide new ideas and methods for comprehensively improving students' overall quality.

Through this study, we have further demonstrated the importance of biomechanical conditioning in enhancing the efficiency of English learning, as well as providing new perspectives and methods for the innovative implementation of curriculum-based Civics. The interdisciplinary integration of biomechanics not only improves academic competence, but also promotes the molding of students' individual and collective responsibility, which has a long-term impact on their overall development.

Data Availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest

The authors declared that they have no conflicts of interest regarding this work.

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