

**USING FLIPPED CLASSROOMS IN TAIJIQUAN SPORTS  
LEARNING FOR STUDENTS IN HIGHER EDUCATION**



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**A THESIS REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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**Thesis Title** USING FLIPPED CLASSROOM IN TAIJIQUAN SPORT LEARNING FOR STUDENTS IN HIGHER EDUCATION

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### **Abstract**

This study investigates the effectiveness of the Flipped Classroom approach on student satisfaction and achievement levels in a Taijiquan higher education setting. The objectives include developing a Flipped Classroom for Taijiquan learning, comparing student achievement scores between Flipped and traditional classroom learning, and evaluating student satisfaction with the Flipped Classroom. The methodology employed included using descriptive statistical statistics and a T-test for data analysis. The results showed that the Flipped Classroom approach significantly impacted the experimental group, increasing student satisfaction and achievement levels. This study supports the effectiveness of the Flipped Classroom approach as it caters to different learning styles.

**Keywords:** Flipped Classroom, Taijiquan Sport, Student Achievement, Student Satisfaction

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As I write this, I am nearing the end of my thesis work and my master's studies; I feel a sense of sadness to say goodbye, as every plant and tree around me, every person and thing will change from now to later. Looking back on my study and life, what has changed is not only my age but also my knowledge, my friends, my way of being and doing things, etc. I want to take this opportunity to thank everyone around me and sincerely thank all of you!

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I would also like to thank the leaders of the College. Secondly, I thank all my classmates for enriching my studies and life.

Lastly, I would like to thank my parents and my wife for their support; because of your silent support, I completed my studies. You are the people I will watch over for the rest of my life.

Zhang Yu

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# CHAPTER 1

## INTRODUCTION

### 1.1 Research Background and Problems

China is a big country in the use of network resources. According to data, there are 802 million netizens in China, and the per capita online time is 27.7 hours per week (Duan, 2019). The report further shows that Chinese netizens account for the most significant proportion of middle school students, as high as 24.8%. With the rapid development of Internet technology, the Internet has penetrated into all aspects of people's lives, and the Internet has also brought great changes to education. The Internet is highly open, and it also breaks the traditional closed and single model of education, making educational resources more global, open, and interactive, driving unprecedented breakthroughs in education and teaching models (R. Huang, 2023). The flipped classroom is a product that conforms to the development of this era. The use of network information technology can allow students to complete knowledge learning at home, turn the classroom into a place for interaction between teachers and students, and better adjust the students' learning. In and out of class time, the initiative of learning is handed over to the students. Compared with the boring and boring teaching of Taijiquan in the past, the application of flipped classrooms can fully arouse the enthusiasm of students in learning (Khan et al., 2022). In Taijiquan teaching, single exercises are often used as the teaching content, and the movements of each style are relatively short, so it is suitable to use video for teaching. Use short and powerful teaching videos to explain and make teaching more targeted; students can watch them at any time and can watch them repeatedly when encountering key and difficult problems. Humans' memory of movements is cyclical and requires frequent review to strengthen memory. At the same time, motor movements also need frequent practice to increase fluency, thereby enhancing students' coordination and other physical qualities. The flipped classroom builds more reasonable learning for students. Through the pre-class Study, students master the key points and difficulties and understand where they are lacking. In the classroom, they discuss with teachers and classmates and correct mistakes in time to strengthen the absorption and internalization of new knowledge (J. Zhang, 2022). It is convenient for students to consolidate and deepen their learning, and the video storage time is long, which can be convenient for students to watch at any time in the future and strengthen their memory. As an efficient teaching mode, flipped classroom not only improves students' interest in learning but also promotes teachers' teaching effect.

Taijiquan is the jewel of traditional national sports. Although its origin is slow to develop, nowadays, it is moving step by step from Asia to the world, and people can see people playing Taijiquan in different corners of the world. As time goes by and the information society is updated more and more rapidly, Taijiquan, as a representative of excellent traditional culture, will spread to the world a new message of future human culture. Taijiquan is a sport with both national color and cultural identity, and it is also an important part of the physical culture on college campuses. Taijiquan is widely taught as an elective and compulsory course in international and domestic universities, and it has a good effect on the physical and mental health of students. However, the teaching of Taijiquan is mainly in the form of single exercises, and the classroom

atmosphere is monotonous and boring, which inevitably reduces students' motivation to learn Taijiquan. Moreover, compared with the more competitive physical education such as basketball class, the movements of Taijiquan are more complex and slower, and less attractive to students.

The idea of flipped classrooms originated from Nathan Bergman and Aaron Sams, two chemistry teachers at Woodland Park High School in Colorado, U.S.A. They proposed flipped classrooms initially to help students who were late or delayed to make up for their lessons. Since its introduction to China, the flipped classroom model has been widely used and developed in subjects other than physical education, which is gradually being experimented with in recent years with some success, but the breadth of its application is still being explored. As higher education is in the trend of deepening reform, people from all walks of life are discussing how to solve the problems of teaching and learning at the present stage, including how to play the leading role of teachers, how to reflect the main position of students, how to continue to deepen students' learning enthusiasm and innovation, and how to broaden the spatial and temporal dimensions of students' learning.

The use of short and concise videos makes teaching more relevant, and students can watch them at any time, regardless of time and place, and can repeat them several times when they encounter key and difficult problems. The flipped classroom provides a more reasonable learning process for students, who can master the key points and difficulties through pre-class Study and understand where they are lacking. Students learn the key points and difficulties before class, understand where they are lacking, discuss and explore with the teacher and classmates, and correct their mistakes in time to strengthen the absorption and internalization of new knowledge. It is convenient for students to consolidate and deepen their learning, and the long retention time of the video makes it easy for students to watch it at any time later to strengthen their memory. The flipped classroom, as a highly efficient teaching mode, can bring improvement not only in students' interest in learning but also in teachers' teaching effect. Therefore, this Study tries to integrate the flipped classroom teaching mode into the work of teaching Taijiquan in physical education classes and continuously explore and improve this teaching mode in the teaching process so as to provide a reference for the promotion of Taijiquan In this paper, and we try to integrate the flipped classroom model into the teaching of Taijiquan in physical education.

### **1.2 Research objectives**

There were three main objectives of this Study:

(1) To develop a flipped classroom for higher education students learning the sport of Taijiquan.

(2) To compare student achievement scores between flipped classroom learning and traditional classroom.

(3) To study the satisfaction of higher education students with the flipped classroom for Taijiquan movement learning.

### **1.3 Research questions**

The specific research contents are as follows:

RQ1: How to develop the specific use of flipped classrooms in teaching Taijiquan?

RQ2: Is there a difference in learning achievement between students learning with flipped classrooms and those who learn with traditional methods?

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RQ3: Is there a difference in students' satisfaction when using flipped classrooms?

### 1.4 Conceptual framework

The flipped classroom is the independent variable, and student's academic performance and satisfaction are the dependent variables. The relationship among the three can be explained as follows: if flipped classroom produces obvious effects or no effects, students' performance in learning Taijiquan will be affected, and student satisfaction will be affected.

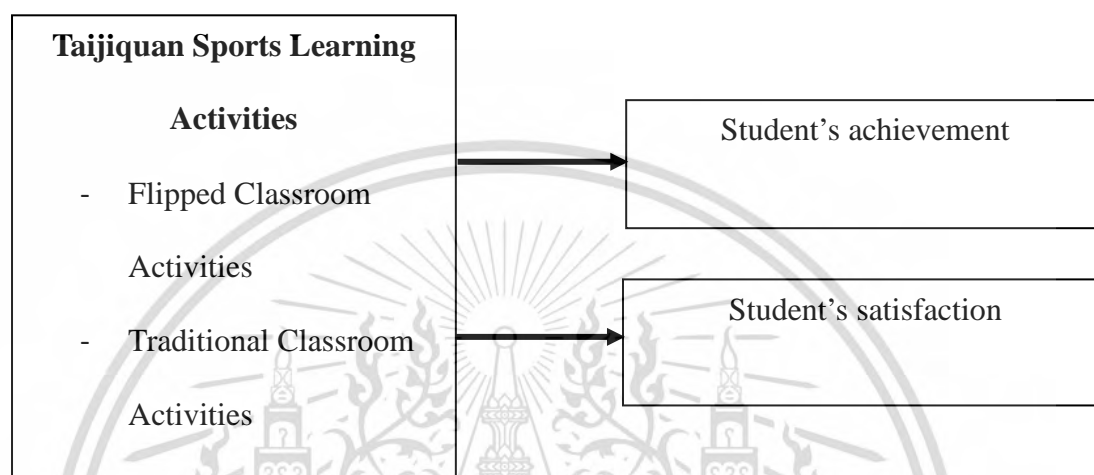


Figure 1.4 Conceptual framework

### 1.5 Scope of the Study

The target group is 180 students from 5 Taijiquan elective classes at Shanxi Jinzhong Institute of Technology in Shanxi province, China. Then 2 classes of students were randomly selected from 5 classes and divided into experimental groups and control groups (60 students in each group). These two classes' students are the participants of this Study. This Study used cluster sampling technology to explore the flipped classroom teaching mode of Taijiquan teaching in colleges and universities. Aiming at the core value of flipped classroom teaching mode in college Taijiquan teaching, the Study used proposes corresponding solutions for its implementation process, which adds to the deficiencies in the application of flipped classroom teaching in physical education courses. The experiment was conducted with the consent of 120 students.

For the evaluation of the teaching effect of Taijiquan, with reference to the core literacy requirements of physical education subjects and considering the operability of the measurement of the teaching effect of Taijiquan, this Study used the physical fitness level and Taijiquan skill level in the physiological test as indicators and the exercise attitude in the psychological test as indicators to evaluate the teaching effect. The physical fitness level test was operated with reference to the National Student Physical Fitness Standard, with a total score of 100 points; the Taijiquan skill level test was conducted with reference to the Scoring Rules for Taijiquan Competition, with a score of 10 points; the measurement of exercise attitude was operated with the relevant questions of the Exercise Attitude Scale.

There were two types of variables in this study, as follows:

1. Independent variable: Learning Activities

2. Dependent variable: Students Achievement

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## 1.6 Definition of terms

Flipped classroom refers to the realignment of time in and out of the classroom, shifting decision-making over learning from teachers to students. In this model, valuable time in the classroom allows students to focus more on working together to address localization or globalization challenges and other real-world issues to gain a deeper understanding. Instead of using class time to deliver information that requires students to work independently before class, teachers can watch video lectures, listen to podcasts, read enhanced e-books, discuss with other students on the Internet, and access materials at any time. Teachers also have more time to communicate with everyone. After class, students independently plan the learning content, learning rhythm, style, and presentation of knowledge, while teachers adopt teaching and collaboration methods to meet the needs of students and facilitate their personalized learning. The goal is to let students get more real learning through practice.

Taijiquan sport is a Chinese martial art is the traditional Chinese Taijiquan in the philosophy of Confucianism, Taoism, Yin and Yang dialectical concept as the core idea, set the temperament, strengthen physical health care and other functions into one, combining with Yi Yin and Yang five elements of change, the doctor of traditional Chinese medicine meridian, formed a kind of inside and outside and repair, and flexibility of traditional Chinese boxing.

Students' Achievement is an academic achievement that can be divided into a broad and a narrow sense. In the broad sense, it refers to a student's achievement in learning. In a narrow sense, it refers to the digital evaluation or grade evaluation that students receive under a specific learning evaluation model. In general, academic performance is classified as "excellent," "good," "passing," and "failing. In this study, students received higher scores for academic achievement. In teaching, teachers should not only pay attention to the teaching, accumulation, and consolidation of technical skills but also cultivate students' abilities. At the same time, it also reflects the students' knowledge accumulation, the dialectical relationship between consolidation and development ability. This principle is actually related to teaching goals from the perspective of the whole process of talent training and growth, the accumulation, consolidation, understanding, and intelligence cultivation of technical skills (knowledge) run through the whole process of talent growth. Stages have different purposes and requirements. What students acquire during their studies are fundamental knowledge and technical skills that are intended to be applied later in their studies and work. In terms of knowledge, the scores of students in the experimental group will be higher than those in the control group, and the operation skills of Taijiquan will be more skilled.

At present, the student performance management system we use generally includes the following modules:

1. Student information management: including the entry, editing, and query of students' basic information.
2. Course information management: including basic course information input, editing, and query functions.
3. Score statistics and analysis: Score statistics and analysis can be carried out according to different courses and time periods, and various charts and reports can be generated.
4. Transcript printing and export: Transcripts can be generated according to the student's choice and can be printed and exported.

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5. Rights management: You can set the rights of different users to ensure the normal operation of the system and protect the security of data.

The student achievement management system can effectively improve the efficiency of school teaching management and promote the exchange and communication between students and teachers. At present, the student performance management system we use generally includes the following modules:

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Student satisfaction is the indicator of student satisfaction and has always been one of the most important indicators of the success of teaching and learning. Student satisfaction is used as a quantitative evaluation criterion, a number that reflects a specific trend and can also be expressed in the form of words. In practical terms, satisfaction is a difficult indicator to define, often with personal emotions, while the results of satisfaction can be influenced by various external factors.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Flipped classroom

Xu, J. Zhang (2022) . " Flipped Classroom" is also called "Inverted Classroom," which fully combines Internet technology and teaching concepts .64(7),34–37. The flipping in a flipped classroom is mainly the inversion of the subject in the learning process and the internalization of knowledge. Traditional The teaching method is teacher-centered, and the teaching of flipped classrooms is student-centered; in the traditional teaching method, the learning of knowledge is actively imparted by teachers to students, and students receive passive learning in the classroom, and the entire learning process is in a passive state. In flipped classroom teaching, students conduct autonomous learning before class and enter the classroom with questions. During the whole teaching process, students are actively seeking knowledge, which truly realizes a teaching mode of internalizing and absorbing knowledge(Wang, 2022). In layman's terms, the flipped classroom is a change from the purpose of mobilizing students' enthusiasm for learning by listening to teachers in the classroom. Students change from passive acceptance of learning to active acceptance of learning. To a certain extent, it is clear and embodies the learning-centered teaching philosophy(Zhao & Dawod, 2023). The flipped classroom has been widely used in higher education in my country. The universality of flipped classrooms makes it one of the ways of teaching reform in various disciplines. In the field of sports, there are also application cases in badminton, volleyball, and other teaching classrooms(Zhao & Dawod, 2023). The universality, ease of operation, and interactivity of flipped classrooms match the characteristics of Taijiquan, which does not require a large venue and requires too much capital investment. Therefore, combining the advantages of the two, it is feasible to apply the flipped classroom to Taijiquan teaching(Kazeminia et al., 2022).

"Flipped Classroom" (Flipped Classroom) refers to flipping the way of learning in and out of class, i.e., learning new knowledge in class and then bringing the self-study above class to discuss questions, complete assignments, and consolidate knowledge.

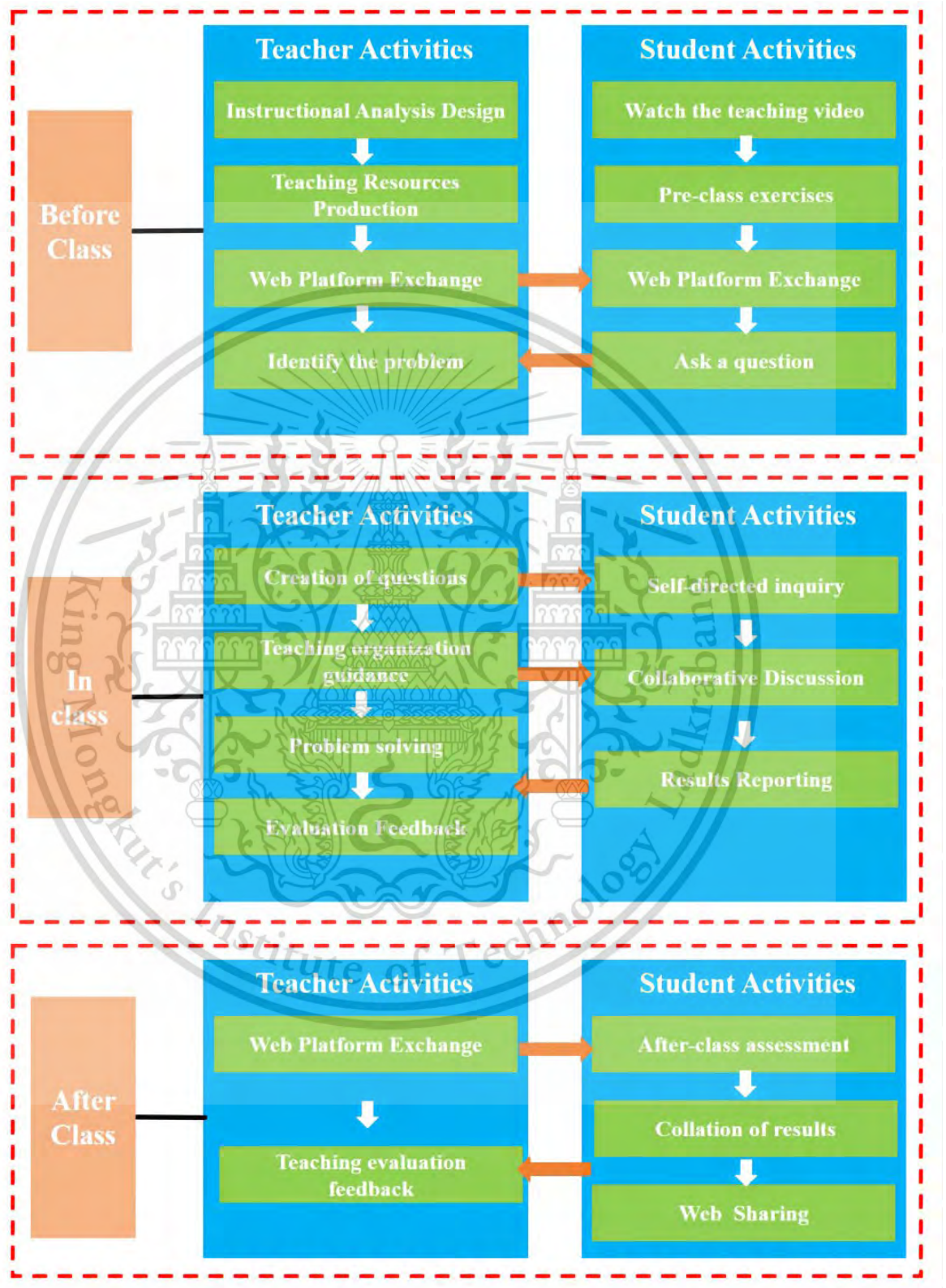
The definition of the flipped classroom is largely the same among domestic and foreign scholars but with their own nuanced insights. Foreign ones take Salman Khan, the founder of Khan Academy, as the main representative person; Salman Khan has made a very great contribution to the research and dissemination of flipped classrooms, and the reason why the flipped classroom teaching model has today's development of which cannot come from his role. For the definition of flipped classroom, he explains that students use their after-school time (before class) at home or anywhere to open the teaching videos on Khan Academy online using web tools to learn and then do the homework problems of learning related knowledge points in the classroom during the class time, and students and teachers directly and timely discuss the problems encountered in the process, this kind of teaching mode which makes the link of class and the link of class just do the opposite, we call it the flipped classroom teaching mode.

Domestic scholars mostly focus on the value of the flipped classroom, the advantages, and disadvantages of the teaching model compared with the traditional teaching model, etc. In his research results, Dr. Wang Guoliang of Beijing University

of Physical Education defines the flipped classroom as a model with the goal of cultivating students' ability, focusing on learning and mastering the knowledge and skills before class through the information network platform and classroom teaching as the medium, and then absorbing and applying the knowledge and skills during and after class. It is a mode of personalized teaching based on group teaching. He pointed out that education and teaching with the goal of cultivating students' learning ability echo China's talent cultivation requirements; the information network platform and the medium of classroom teaching reflect that the flipped classroom is the new teaching mode that overrides the background of the network information era and responds to the development of the times; it focuses on learning and mastering knowledge and skills before class, digesting and absorbing and applying them during and after class, reflects the standardization process of flipped classroom teaching model; personalized teaching reflects that flipped classroom teaching treats students' individual development more seriously and follows the teaching concept of teaching according to their abilities.

On the basis of a comprehensive understanding of previous studies and the author's own understanding, the flipped classroom is defined as a teaching method that makes full use of the modern information network platform, combines the most scientific teaching concepts, breaks through the boundaries of time, overturns the structure of traditional teaching methods, and is more humane.

The flipped classroom is not only a flipping of the teacher-student relationship but also a flipping of the classroom content, as well as a flipping of the way of teaching evaluation. First, students become the main subject of teaching. The relationship between teachers and students is quite equal and democratic, promoting students' independent learning and focusing on teachers' personalized guidance to students, which is a teaching mode that changes the traditional relationship between students and teachers. Second students pre-class on the teacher's pre-recorded The second student watches and learn from the teacher's pre-recorded video before class, and the class time is spent on communication and discussion among students and between students and the teacher, which is an important feature of the flipped classroom model. Third, in the traditional teaching model, teachers quiz students on their knowledge and learning outcomes at the end of the class for testing purposes. In contrast, in the flipped classroom model, the teacher's test is placed after the students have watched the video and before the classroom instruction so that the teacher can learn more about the difficulties and shortcomings of the student's learning so as to adjust the teaching content and provide targeted guidance to the students.



**Figure 2.1** Flipped Classroom teaching model

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## 2.2 Taijiquan

As a traditional Chinese sport, Taijiquan, with the concept of dialectic at its core, can cultivate the temperament of the practitioner and achieve the effect of strengthening the body by using static and softness to overcome rigidity; it is a sport that combines the changes of yin and yang and the five elements of Yi and focuses on the harmony of the whole body based on the meridians of Chinese medicine, using body, mind, and breath adjustment to bring the body to the best comfortable state. Taijiquan has good effects on the cardiovascular system, respiratory system, skeletal and muscular system, and neuropsychiatric system of the human body, and is beneficial to the health of all parts of the body. Taijiquan originated in Chenjiagou, Wen County, Henan Province, China, and has a long history and culture since its inception, with over 300 million practitioners worldwide, according to incomplete statistics. As a sport and fitness program, taijiquan is of great research value because it is popular among the whole population with its features of being suitable for both young and old and rich in functions.

There is this different focus in research on taijiquan, both domestically and internationally Xiujie, (2022). Ke et al. (2022), in their "Comparative Analysis of Taijiquan and Health Promotion Research in China and the United States in the Last 20 Years," pointed out that China and the United States have formed two development patterns in different directions based on the same research due to very different research philosophies and other factors, and also have their own development paths that have different impacts on the development of Taijiquan research. (Liu, 2022) In China, research has been conducted mainly on taijiquan as a sport, including its health maintenance, gongfu, etc. In the United States, the medical aspects of taijiquan have been explored in depth, and the medicinal value of taijiquan has been studied in terms of its intervention in diseases, which has embarked on the path of sports integration and has reflected the importance of the integration of physical medicine. Of course, both have their own research directions, but both play different but vital roles, and our country should also integrate with the American concept to take the research and development of taijiquan to another level and bring the value of taijiquan to the maximum.

Taijiquan as a sport also has a pivotal role in the development strategy of healthy China in China. (Chen, Tai, & Liu, 2023) Proposed two development paths for taijiquan's contribution to the construction of a healthy China in their "Research on the scientific support and path of taijiquan's contribution to the construction of a healthy China"; the first step is, of course, to explore the demand, and on the basis of the demand, to improve the organizational path, expand and further optimize the path of taijiquan dissemination, and enrich and deepen the implementation of taijiquan's health public services; secondly, to Through the aspect of sports industry, taijiquan exercise in the form of a sport skill and exercise prescription in the context of physical medicine integration, and through the way of product to promote the trial run of taijiquan health paid services simultaneously online and offline in the network information era. (Yin, Yu, Wang, & Sun, 2023) In the process of spreading taijiquan as a culture internationally, although the general environment at home and abroad provides opportunities and also faces different dilemmas, (X. et al., 2022) put forward valuable communication strategies in the context of "One Belt, One Road," the first of which is to strengthen the awareness of international communication of taijiquan culture and increase The first is to strengthen the awareness of international communication of taijiquan culture and increase the efforts of external publicity (Vang, 2023). In school

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sports, the Study of taijiquan teaching is pivotal, and scholars have dedicated themselves to the dissemination of taijiquan teaching through the innovation of taijiquan teaching mode. Their article "The Practice of "Gong Sui Uses" Integrated Teaching Model in Wushu Special Technique Class" (Cheng, 2022) first pointed out the current problems of wushu teaching, in which the teaching methods are conventional and old-fashioned, disconnected from the needs of the current network information era, the teaching mode and teaching evaluation are single, and teachers and students receive less feedback. and students get less feedback, no memory points and other problems are also deeply reflected in the teaching of taijiquan(Li et al., 2022). also points out many unavoidable problems in the current taijiquan teaching, on the basis of which Ai expands the path for taijiquan teaching through the mutual integration with multiple intelligences theory, proposing not only to keep pace with the rapidly developing times and actively implement the education concept of lifelong learning, but also to improve teachers' teaching quality, meet students' needs for good learning, provide more learning resources and environment, and strive to do a good job of reforming the education model to achieve the most optimal teaching and evaluation to better achieve students' all-round development. It is proposed that we should not only keep pace with the rapid development of the times, and actively implement the concept of lifelong learning education but also improve teachers' teaching quality, meet students' needs for learning, provide more learning resources and environment, strive to do a good job in reforming the education model and achieve the optimization of teaching and evaluation to better achieve students' all-round development(Li et al., 2022). In their Study, (Zhuang et al., 2021) pointed out that Taijiquan has rich routines, profound cultural connotations, and fitness and health functions. Practicing it in university physical education courses is positive for students' physical fitness and cultural knowledge improvement. However, Taijiquan teaching has encountered some difficulties and obstacles in the process of development, including the single content of teaching, the rigidity of the teaching method, and the irregularity of technical movement presentation. In her Study, Sang Shouhui found that there are existing problems, such as insufficient teachers, lack of teaching materials, and outdated teaching methods, which prevent the development of taijiquan courses in colleges and universities. (Y. Huang, 2017)In a survey of the current situation of taijiquan courses in colleges and universities, it was found that the development of taijiquan courses continues to have problems with student perceptions, teachers, teaching methods, and other content(Komelski et al., 2022).In order to promote the development of taijiquan courses in colleges and universities, some researchers have innovated them in terms of teaching methods, teaching modes, and teaching designs. (HanLiang & LiNa, 2022) And other researchers have used multimedia support for teaching taijiquan in colleges and universities as a way to make students experience the interest in learning taijiquan and enhance their self-learning ability through the new design and demonstration of taijiquan courses by teachers in a novel way of teaching.

In summary, Taijiquan, as an intangible cultural heritage of China, has its unique utility value but also faces great challenges in the process of dissemination. In order to promote the development of taijiquan courses, researchers have tried to reform the courses in different ways in terms of curriculum design, teaching mode, and teaching methods in order to promote the better development of the courses. However, among all the materials on the innovation and reform of the taijiquan teaching mode, no research on the application of flipped teaching mode has been found. The reform of the taijiquan teaching model is urgent, and scholars need further in-depth research.

### 2.3 Student achievement

In order to directly reflect the learning effect of the two groups of students, by quantifying the school effect according to the scoring rules of the Chinese Wushu Taijiquan referee method and combining the ability of the college student's skill level, the scoring criteria for the students' Taijiquan routine skills in this course are divided into five level.

They are: excellent, good, medium, pass, fail.

1. Excellent: Excellent performance in all aspects, standardized and smooth movements, correct posture, internal and external coordination, and overall beautiful performance.

2. Good: The performance is good, the movement is standardized and smooth, the posture is correct, there is a strong internal and external echo, and the appropriate use of skills.

3. Medium (Fair): Each performance basically meets the requirements of Taijiquan, but it needs to be improved. The movements may be slightly wrong, and stronger internal and external echoes and skills are needed.

4. Pass: Although there are certain shortcomings in each performance, it can still meet the basic requirements of Taijiquan, and it is necessary to strengthen the training in terms of movement norms, fluency, body posture, and internal and external echoes.

5. Fail: All performances obviously do not meet the requirements of Taijiquan, and there are serious problems in movement standardization, fluency, body posture, and internal and external response, which need to be re-learned and trained.

The theoretical assessment content of this research mainly includes the names of the technical movements of Taijiquan, the names of the hands and steps, the offensive and defensive meanings of the technical movements, and the requirements of the technical movements. A total of 7 questions are included, with a total of 50 points.

The seven questions are:

1. Please write down the names of the Taijiquan technical movements in this teaching.

2. Please write down the requirements for the technical movements of Taijiquan in this teaching.

3. Please write the name of the Taijiquan technique moves in this teaching.

4. Please write the offensive and defensive significance of Taijiquan technical movements in this teaching.

5. Please write down the essentials of the warm-up movements before the Taijiquan class in this teaching.

6. Please write down the main content of the last form of Taijiquan in this teaching.

7. Please write down the benefits of Taijiquan in this teaching for future health.

(1) 90-100 points. The movements are accurate, skillful, and spacious, with a low and smooth center of gravity, fully reflecting the Taijiquan style.

(2) 80-89 points. Accurate, skillful movements low center of gravity, reflecting the Taijiquan style.

(3) 70-79 points. Accurate movements, low center of gravity, more proficient in completing routines.

(4) 60-69 points. Basic accurate movements, high center of gravity, able to complete independently.

(5) Below 60 points. I cannot do it independently.

## 2.4 Students satisfaction

Satisfaction is relatively abstract, so this paper adopts the "five-stage" method to divide satisfaction into five parts: very satisfied, satisfied, general, dissatisfied, and very dissatisfied and analyzes the overall satisfaction through the choices of different students index. Satisfaction, on the other hand, is measured through indirect methods, as people's attitudes are measured through their actions or reactions to things. By their actions or reactions to things. An example of measuring attitude using this method is observation. In the current Study, the flipped classroom is used to teach Taijiquan to observe the students' attitudes and initiative toward learning Taijiquan. This subsection describes the need to design learning activities to motivate students and increase their sense of achievement, thereby increasing student satisfaction.

## 2.5 Relevant research

### 2.5.1 Related Studies in China

#### 2.5.1.1 Research Status of the flipped classroom in China

In recent years, the door of China opening is opening, and all walks of life have begun to absorb advanced foreign ideas; the same education industry also tends to internationalization, flipped classroom education model into China. 2011 Chongqing Jiangjin Juqi Middle School and Zhuhai District No. 5 Middle School in the same time opened the pilot work of the flipped classroom, a video-based flipped classroom teaching model officially in China; the introduction of this teaching model meets the urgent need for China's education informatization process. In 2012, Kirin Middle School, a member of Nanshan Experimental Education Group, launched a "flipped classroom" teaching experiment under the environment of "cloud computing," which has received wide attention from the education sector in China. At the same time, East China Normal University took the lead in creating the C20 Catechism Consortium to promote the smooth dissemination of flipped classrooms and better use of various educational resources. (Galway, Corbett, Takaro, Tairyan, & Frank, 2014) scholars have also created a flipped classroom teaching model based on case studies of teaching practices, which take pre-course learning and classroom activities as teaching sessions.(Teo, Tan, Yan, Teo, & Yeo, 2014)Designed a more complete flipped teaching model for chemistry labs by integrating them with each other based on the inherent pending points between chemistry labs and flipped teaching. The flipped classroom emphasizes the collaboration among students, and the teacher's guidance to students is targeted, adhering to the principle of "student-centeredness," which is truly "teaching to the student's abilities." (Sun & Wu, 2016)pointed out that the flipped classroom model can improve some of the shortcomings of the traditional teaching model. The flipped classroom can make the classroom lively, with students as the main body of the classroom and teachers playing a supporting role, while schools, parents, and students can all participate in it, making classroom teaching more enriching. At the same time, the flipped classroom teaching model also faces great challenges, such as the uneven teaching quality of teachers, the different levels of educational development in different regions of China, and the more difficult traditional educational ideology that has existed in China for a long time. Zhu Zhiting and(Luo et al., 2021) argue that the internalization of knowledge is transferred from outside the classroom to the classroom, and the learning process is completely flipped in both time and space, which is a new paradigm

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of "learning before teaching." Taiji-loop flipped classroom model that enables two-way interaction between teachers and students in their related instructional design study.(Jantakoon & Piriyasurawong, 2018)Proposed that the flipped classroom teaching model consists of three parts: pre-class instructional video observation, classroom problem-solving, and knowledge summary feedback.

To sum up, the teaching mode of flipped classrooms has been applied to the teaching research of many specific subjects in China, but it is still at the stage of experimentation. There is not enough research on the practice of flipped classroom teaching model in physical education in the current Study, and even less research on flipped classroom teaching in taijiquan, and there is not enough summary of the experience that emerges in teaching. Based on this, this study applies the flipped classroom to taijiquan teaching in anticipation of developing a new teaching model for taijiquan teaching and providing new teaching experience accumulation for flipped classroom teaching. The study also aims to actively look forward to the future development of education, to follow the development of the times, to promote the reform of the traditional teaching model, and to adapt this "imported" teaching model to the specific situation of China and the special features of education.

### **2.5.1.2 Related Studies in China**

The sport of taijiquan is being actively promoted in schools to promote the development of traditional Chinese physical culture, so how to better promote the development and growth of taijiquan in school sports is also increasingly being explored and studied by educators. (Tong, 2019) and others mentioned that there are a series of problems in the current teaching of taijiquan in colleges and universities, so there is a need to reacquaint students with and accept taijiquan from a cultural perspective. In his "Research on the flipped classroom teaching mode of 42-style simplified taijiquan in the options class of general colleges and universities," he pointed out that the teaching of taijiquan in colleges and universities should focus on grasping the 3 aspects of technical norms, technical combat meanings and theoretical knowledge, which is beneficial to crack the current college taijiquan.(Divjak, Rienties, Iniesto, Vondra, & Žizak, 2022)It is also beneficial to promote students' independent learning, cooperative learning, and personalized learning and has a positive effect on the in-depth inheritance and wide dissemination of taijiquan among students in colleges and universities. Teachers should use the characteristics of multimedia technology to teach taijiquan through specific forms such as videos and images, changing the traditional boring and dull classroom teaching, making the technical movements more intuitive, vivid, and specific; students can play the videos repeatedly and adjust the playing speed appropriately according to their acceptance level, which helps students understand and remember the moves, reduces the understanding difficulty of the movements, allowing students to grasp the movements faster, improve the consistency of the movements and correct their wrong movements in a timely manner. His Study (Gao, 2022) found that the current development of 24-style taijiquan in Chinese higher education institutions presents problems such as insufficient mastery of teachers' professional skills and one-sided students' cognition.(HanLiang & LiNa, 2022) Apply the flipped classroom teaching model to the teaching of taijiquan in colleges and universities to change the traditional single, boring, and tedious classroom teaching with the help of modern network information technology, solve the problem of irregularities in the delivery of some technical movements, strengthen students' active learning, improve learning interest and efficiency, and achieve The purpose of this study is to improve students'

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interest in learning and efficiency, and to realize the transition from "boring learning" to "effective learning"(Sutrisni et al., 2022).

In summary, the teaching of taijiquan is basically based on the traditional teaching model, and there are many problems in teaching, such as teachers' lack of professional skills, students' difficulty in learning, boring classes, etc. Scholars believe that the traditional teaching model should be constantly reformed and abandoned in the teaching of taijiquan, which is of great significance to the inheritance and promotion of traditional Chinese sports, as well as to the student's cultural self-awareness and cultural confidence. This is of great importance to the inheritance and promotion of traditional Chinese sports, as well as to students' cultural consciousness and self-confidence. Combined with the aforementioned studies, it can be found that although the flipped classroom teaching model has been used in physical education, the relevant practice rules are different for different programs. Therefore, the use of the flipped classroom model should not be copied but should be based on the specific characteristics of taijiquan combined with modern information technology and through continuous practice, improvement, and perfection, so as to conclude a flipped classroom teaching model that is most suitable for the law of taijiquan teaching and conducive to the development of student's physical and mental health. Based on this, this Study will conduct experimental research on the application of flipped classroom teaching model in taijiquan teaching in order to promote Chinese taijiquan teaching.

### **2.5.2 Related Studies in other countries**

Flipped classrooms in today's information-developed network society, the development of foreign flipped classrooms have been explored and studied in depth by scholars at home and abroad since its first successful practice at Woodland High School in the United States. However, the real recognition by scholars from various countries is attributed to the research exploration of Khan Academy. (Purba et al., 2022)pointed out in his book that the efficiency of the traditional education model has failed to meet the development of society without creativity and innovation, has gradually failed to meet the demand for teaching and learning, and cannot achieve teaching unity. He proposed that the impact of flipped classrooms in the current network information age is huge. The teaching concept and learning methods are revolutionary to the current traditional teaching model.

(Bergmann & Sams, 2012) Describes his research process and findings in his book. The book explains in detail eight examples of flipped classroom practices, and it specifically describes the whole process involved in the implementation of the flipped classroom, promoting the motivation of both teachers and students, the basic elements of flipped classroom instructional design, the relationship between teacher enhancement and school management, the misconceptions of the flipped classroom model of teaching and learning, etc. It is suggested that the key to the flipped classroom is the collaboration in the process of the session, the proper use of teachers and students, as well as resources, and the support of the school.

"Blended Learning - Driving the Education Revolution with Disruptive Innovation," made a comprehensive analysis of blended learning in the new era, including theory combined with practice plus experimental design analysis, and gave a reasonable analysis of student In this paper, the authors provide a comprehensive analysis of blended learning in the new era, including theory combined with practice and experimental design, and reasonable analysis of student-centered teaching mode,

innovative learning mode, and online learning mode, which also gives sufficient recognition to the flipped classroom teaching mode.

In addition to scholars in the United States, some other developed countries have also introduced and explored the flipped classroom in-depth, but the shortcoming is that the flipped classroom model is mostly in the theoretical framework of research, not specific to the actual application of each subject and each grade level, so it needs a lot of practical research to improve the application of the flipped classroom in various subject areas and form a complete teaching model system.



## CHAPTER 3

### RESEARCH METHODS

#### 3.1 Study Design

In order to make the teaching of taijiquan in general colleges and universities can be better carried out and developed, this paper innovates the existing traditional teaching mode and introduces the flipped classroom teaching mode into the teaching of taijiquan in general colleges and universities, and conducts experimental teaching. The main purpose of the experiment of this Study includes two major parts. The first part is: whether there is a difference in the learning effect of taijiquan theory and skills between the students in the experimental group and the control group under different teaching modes; the second part is: whether there is a difference in the physical changes between the students in the experimental group and the control group under different teaching modes. And the experimental design was made according to the experimental purpose, the experiment was put into operation according to the designed process, and the final experimental results were obtained.

**Table 3.1** The experimental plan was as follows

Sampling	Pre-test	Treatment	Post-test
RE	-	X	O1
R.C.	-	-	O2

RE refers to the sample group, the experimental group that learns Taijiquan through the flipped classroom.

R.C. refers to the regular learning control group.

x refers to the learning activities of the experimental group using the flipped classroom to learn Taijiquan.

O1 represents the result of the flipped classroom performance test.

O2 indicates the result of the traditional classroom performance test.

#### 3.2 Participants

The target group was 180 students from 5 taijiquan elective classes at Shanxi Jinzhong Institute of Technology in Shanxi Province, China. Then the students were randomly selected from the five classes into an experimental group (60) and a control group (60). These two class students were the participants of this Study. The reanalysis results through the taijiquan cognitive test, taijiquan skill assessment, and taijiquan exercise interest survey showed almost no difference between the two groups. Students in the experimental group learned the content in a flipped teaching mode, i.e., students received the content from the online public platform before class and studied the content, formed their understanding and recognized it in class, and solved the problems through collaboration and mutual assistance under the guidance of the teacher. In the control group, students followed the traditional teaching mode, i.e., they only studied and practiced the content within the specified time.

Demographic information is as follows:

Experimental group :

**Table 3.2** Information of Participants

		Experimental group	Control group
Male		35	32
Female		25	28
Height (cm)	1.60-1.70	16	13
	1.71-1.80	41	46
	1.81-1.90	3	1
Weight (kg)	40-50	7	5
	51-60	22	28
	61-70	21	17
	71-80	6	8
	81-90	4	2

### 3.3 Research Instruments

The course content of this experimental Study focused on teaching technical and theoretical aspects in Taijiquan. Both groups of students conducted the same course content within the same schedule of classes, and the course content was completed in 14 sessions during the semester. Due to the different teaching modes, the course programs of various other groups were designed and arranged according to their characteristics and functions under the general arrangement of the teaching mode process. Finally, the course content was taught according to the syllabus requirements.

Time: Once a week, 120 minutes at a time.

Period: 2 weeks

Target students: 2 class students were the participants of this Study. (There were 60 students in the experimental group and 60 students in the control group)

#### 3.3.1 Lesson plan

In this part, the researcher was designed the lesson plan for the student's test, which divided into 4 parts as follows (Also see Appendix):

**Part 1 Introduction part:** In this part, the teacher answers the questions raised by the students, demonstrates the technical movements, and points out the key and difficult points of the activities; Students practice in groups, check and correct mistakes, and give careful guidance; Correct the common problems of most students collectively.

**Part 2 Activities at Home Week 1:** In this part, the teacher carefully studies the teaching materials, records the technical movements as a video, and adds text and voice explanations to highlight the key points and difficulties, or intercepts standard technical

movements demonstration videos from the Internet and uploads the videos to the class WeChat group so that students can easily follow the instructions.

**Part 3 Activities at Home Week 2:** The students learn about the new course by watching the teaching video independently and conducting group research and experience independently. Then the teacher answers the questions raised by the students, demonstrates the technical movements, and points out the key points and difficulties of the movements.

**Part 4 Activities at Home Week 3:** In the final part, the teacher will explain and correct the mistakes of the students' movements in the previous class and inform the students of the essentials of the movements. Then, record the content and technical actions of this lesson specified in the textbook into a video, add text and voice explanations, highlight key points and difficulties, and upload them to the classroom WeChat group so that students can easily follow the instructions. Students can watch instructional videos at any time according to their own schedule. Students can also find relevant teaching content and materials online and communicate with other students in the group at any time. Teachers should also answer questions from students.

### **Communication between teachers and students:**

In the traditional teaching mode of Taijiquan in colleges and universities, teachers and students can only communicate with each other in the short teaching time of a few minutes in the classroom. When discussing the teaching content of the classroom, there is little communication between teachers and students and between students. The flipped classroom teaching mode of Taijiquan in colleges and universities uses the flipped classroom software as a platform. During the process of watching micro-videos, students can communicate with teachers and students online through the software or WeChat groups and Q.Q. Groups in a timely manner. At the same time, in the classroom, there is more time for face-to-face consultation and discussion with teachers and classmates. The combination of online and offline provides ample time for communication.

**Part 5 Classroom teaching:** In the teaching mode of the flipped classroom, students' group communication and learning are self-organized. Students can not only improve communication among classmates through freely combined group exercises but also promote friendship, making the learning of teaching content more active.

In the traditional Taijiquan teaching mode, it is usually group teaching. There are many students in a class, and the students in the back often cannot see the teacher's demonstration and explanation, and then group teaching is carried out according to the queue position. During the whole teaching process, students are too passive.

At this stage, the purpose of physical education in China mainly includes all-around development and other aspects, combined with the impact of taijiquan exercise on the individual's own physiology and psychology, etc. The test program was based on this basis to select the following content for testing and comparison to find out whether there are differences between different teaching modes in the experimental effect. The composition of the final grades of the students in the experimental group and the control group were 10% for the usual grades, 20% for physical fitness, and 70% for technique.

The skill-learning part of this experiment mainly includes the practice of Taijiquan routines. The research instruments were: a taijiquan cognitive test paper prepared, scoring rules for taijiquan competitions.

In order to evaluate the current situation of students' understanding of Taijiquan, this Study refers to the core literacy requirements of physical education, considers the operability of Taijiquan understanding effect measurement, and uses test papers to test Taijiquan cognition. The test paper has a total of 20 questions; each question is 5 points, and the full score is 100 points.

In order to be able to visually reflect the learning effect of the two groups of students, by quantifying the effect of the school, the scoring standard of the taijiquan routine skill level of the students of this course was divided into five levels according to the scoring rules of the Chinese martial arts taijiquan judging method and combined with the ability of the skill level of college students (see Table 3.1). The content of the theoretical assessment in this Study mainly includes the names of technical movements, names of hand and step patterns, the meaning of attack and defense of technical movements, and the requirements of technical movements for Taijiquan. A total of seven questions with a total of 50 points were included.

Taijiquan test movement requirements :

The movements are accurate, soft and slow, continuous, loose body and quiet mind, natural breathing, arcing movements, smooth articulation, light and steady.

**Table 3.3** Standard range of Taijiquan movements

Action	Requirements and standards	The evaluation gauge				
		5	4	3	2	1
Accurate movements	There is no error in the whole movement when punching					
Soft and slow	Stay for more than 3s during each movement.					
Continuous	No pauses in the movement					
Articulate and smooth	Basic accuracy of movement and smooth connection with the previous movement					

Taijiquan movement scoring range, According to the National Martial Arts Administration, Ministry of Education document scoring standards. <https://www.sport.gov.cn/wszx/>

1. Posture correctness (10 points): Assess whether the participants' Taijiquan posture is accurate, including body posture, finger movement, breathing, etc.

2. Fluency and balance (10 points): Assess whether the participants' Tai chi movements are fluent and whether they are able to maintain balance and quickly switch between different movements, presenting a natural feeling.

3. Breathing control (10 points): Assess whether participants can correctly master the breathing techniques of Tai Chi and apply them to each movement to achieve the effect of soothing and relaxing the body and mind.

4. Sense of rhythm (10 points): Assess whether participants can master the sense of rhythm in Tai Chi and complete each movement on the correct beat.

5. Expressive force and appeal (10 points): Evaluate whether the participants' Tai Chi movements are expressive and appealing and whether they can convey a soft and relaxed atmosphere through their movements so that the audience can feel the comfort and calm brought by Tai Chi.

6. Overall coordination (10 points): Assess whether participants' Tai Chi movements have overall coordination, not only between body parts but also with Tai Chi music.

7. Artistic effect (10 points): Evaluate whether the participants' Tai Chi performance has certain artistic effects, including stage effects, modeling effects, dynamic effects, etc.

8. Clothing and appearance (10 points): Assess whether each participant's clothing and appearance are neat, appropriate, and appropriate to the theme of the Tai Chi performance.

9. Understanding the spirit of Taijiquan (10 points): Assess whether the participants have understood the spirit of Taijiquan, including the spiritual connotation of overcoming hardness with softness, static braking, and continuous progress, and demonstrate it through actions.

The total score is 100 points.

Physical fitness scoring criteria:

The physical fitness scoring rules of this study were based on Chinese students' physical fitness standards and made different levels of classification for four items: endurance running and lung capacity. The Taijiquan Interest Scale has 20 questions with 5 levels of scoring levels. It includes four-dimensional factors, which are active exercise; activity participation; course attitude; and information concern. Active exercise refers to students' active taijiquan exercise after school hours. Activity participation refers to students' active participation in group organization activities related to Taijiquan in their lives. Course attitude refers to students' performance in class and their perception of the course as a whole. Information attention refers to how much students pay attention to taijiquan competitions, news, and other types of information in their lives.

3.3.1 Verify the content of Taijiquan applied in the flipped classroom through experts.

The researchers applied Taijiquan to flipped classroom teaching and developed a lesson plan. Lesson plans are co-designed by the researcher's mentor and five experts in the field.

The theoretical test is 30 minutes, the practical test is 60 minutes, and the questionnaire is 30 minutes.

This Study invited 2 physical education teachers and 3 Taijiquan technical experts to verify the consistency and content validity of the tests and questionnaires using the Indicator of Concordance (IOC).

The test content of the experimental group and the control group is the same and is divided into the Taijiquan theory test and the Taijiquan action test according to the scoring standard.

Evaluation criteria are used to check the consistency of objectives and test items. The evaluation criteria are as follows:

+1 = Test item is considered to be consistent with the objectives.

0 = The test item is considered neutral in terms of its alignment with the objectives

-1 = Indicates that the test item is not aligned with the objectives.  
For acceptable data, the overall mean score for the Item-Objective Congruence (IOC) the metric is greater than 0.5.

### 3.3.2 Try out

In addition to the experimenter, 10 people were selected for the trial to test the validity of the Study. The test questions are basic questions of Taijiquan's theory and application.

These students also belonged to the Shanxi Jinzhong Institute of Technology but were not the sample for this Study. After the test, the reliability index of the results obtained by the Kude Richardson formula (Ismail, R., 2018) verifies the validity of the experiment.

Also, try having five experts in the field of Taijiquan to check for consistency between test objectives and items. The data obtained are used to calculate the objective Item-Objective Congruence for the project.

### 3.4 Procedure

The flow of the traditional Taijiquan course teaching model is divided into three parts. Before the class: The teacher will prepare the content of the teaching program for each class according to the semester schedule.

Classroom: This section involves three main parts. New class introduction: According to the semester syllabus arrangement, in each class where new content is taught, the teacher introduces the new movements into the class through the form of technical movement names and content introductions. However, before introducing the new lesson, teachers need to organize students to review the content of the previous lesson. Knowledge Explanation: The teacher explains the technical movements to the students through demonstration and decomposition methods and organizes the students to practice. The instructor will also correct any technical errors made by the students during the class. Assignment: Finally, the teacher will assign the homework according to the course content and students' learning situation to review the content of this class.

After the lesson: Students practice based on what they have learned in class.

The flipped classroom teaching model based on the online public platform is always divided into three parts: the pre-class part, the class part, and the post-class part.

Pre-class section: This section is divided into two contents, which are teacher activities and student activities. Teacher activity means that teachers design and edit the teaching contents according to the teacher's objectives and syllabus arrangement before class and publish the edited text, graphic, audio, video, and other types of teaching content to the online public platform one week in advance; and they can interact with students according to the teaching contents in the online group. In order to ensure that students study consciously before class, teachers need to communicate with students regularly to encourage and monitor their learning activities. Students' activities are to log in to the software, receive information about the teaching content, practice taijiquan skills a week in advance according to the requirements and tips of the teaching content, and interact and answer activities with classmates or teachers in the group chat to achieve the initial internalization of the knowledge content learning. In order to monitor the student's completion of the course content, students will send their own practice of taijiquan to the teacher in a video after the course content is completed.

**Classroom part:** This part mainly refers to a series of teaching activities such as question and answer, individualized tutoring, and cooperative practice by teachers based on students' feedback on their learning before class. The feedback part includes two parts, feedback from students to teachers (i.e., the difficulties of learning and acquisition gains, etc.) and feedback from teachers to students (i.e., teachers' feedback on the completion of students' homework before class, and the content of common mistakes made by students in learning knowledge); personalized tutoring mainly refers to teachers' individual or group tutoring according to students' characteristics combined with different teaching methods and means, so that students can master the technical movements and theoretical knowledge efficiently through special guidance; the individualized tutoring refers to the individual or group tutoring according to the students' characteristics and different teaching methods and means, so that the students can master the technical movements and theoretical knowledge efficiently through special guidance; the cooperative practice refers to the group practice in the class when the students have mastered the main content of the lesson, so that the students can consolidate the course content in a deeper level through mutual supervision and collaboration.

**Post-course part:** After the course, teachers need to summarize and evaluate the course based on the editing of the teaching push files, the completion of the teaching content, the performance of students, and the organization of teaching, in order to provide help and reference for the smooth running of the next course.

**Teaching video** Select online teaching video resources. Taijiquan teaching video There are many teaching video resources on the Internet, most of which are experts in Taijiquan. Selecting such famous boxers' teaching videos will help standardize teaching, enhance students' interest in learning, and increase the initiative of self-study. Sex. Edit instructional videos into short videos of 5-8 minutes. In this way, it is not only convenient for uploading but also ensures that students can finish watching the video within the time of relatively concentrated attention and will not get tired of the teaching video. It not only improves the efficiency of teachers in the implementation process of flipped classrooms but also promotes the enthusiasm of students in autonomous learning.

**Class process:**

The teaching process of the traditional teaching mode is mainly the class link, which is divided into several stages such as preparation activities - teaching explanation - student practice - correction and answering - after-class summary, etc., attaching great importance to the leading role of teachers in controlling the entire teaching process.

The teaching process of the flipped classroom teaching mode is divided into video production—uploading the flipped classroom software and assigning tasks—students self-study through the software preparatory activities, classroom inspections—teacher-student exchanges correction and answering questions—after-class summary— - Evaluation and other links, in the teaching process, students are the main body, focusing on the learning effect of students, of course, teachers need to control the rhythm of the teaching process based on assistance in the classroom activities.

### **3.5 Data analysis**

The test scores were calculated to find any significant differences by finding the mean of the scores. To find out the significance of standard deviation (S.D.) and test scores, t-test.

The quantitative results obtained from the closed-ended questions in the questionnaire were used to determine any significant differences by calculating the mean and standard deviation (S.D.) of the scores. The interpretation of the average

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achievement of the close-ended questionnaire was as follows:

4.50 – 5.00 = very satisfied

3.50 – 4.49 = satisfied

2.50 – 3.49 = general satisfied

1.50 – 2.49 = dissatisfied

1.00 – 1.49 = very dissatisfied

The quantitative questionnaire obtained from the open-ended questions reveals students' cognition of the effect of flipped classrooms through content analysis.



## CHAPTER 4

### RESULTS

This chapter reports the results of research based on data and quantitative methods to achieve research objectives. The results of this study were obtained from the pre-test, post-test, and questionnaire survey completed by 60 students in two randomly selected classes of the five elective courses. The data obtained from the research tool revealed the answers to the five research questions in this Study: The specific research contents are as follows:

RQ1: How to develop the specific use of FLIPPED classrooms in teaching Taijiquan?

RQ2: Does learning achievement differ between students learning with FLIPPED classrooms and those who know with the traditional method?

RQ3: What is the satisfaction level of students when using FLIPPED classrooms?

The research results are presented in the form of tables and explanations. The results of the data analysis are divided into two parts:

Comparative analysis of students' scores before and after the test. This part mainly analyzes the pre-test and post-test results of students participating in the Tai Chi flipped classroom learning activities from the aspect of Tai Chi achievement.

Analysis of student satisfaction. This section describes the students' satisfaction with participating in the flipped class learning activities of Tai Chi through charts.

#### 4.1 The Activities Design and Development

This paper designed a two-week course activity to verify the influence of flipped classroom learning activities on students' learning effects and attitudes at Shanxi Jinzhong Institute of Technology in Taijiquan. In the first class of the first week, the teacher will make predictions to understand students' physical quality level and Tai chi technical movement level. In the second class of the first week, students will watch a video of Tai Chi movements and ask questions, and the teacher will answer students' questions and make a summary. Students will study in groups after class to lay the foundation for the next flipped classroom learning activity. In the first class of the second week, the teacher guided the students to learn Tai Chi movements to consolidate the previous knowledge. After learning Tai Chi in a flipped classroom, students began to practice and show in groups, correct mistakes and learn from each other to consolidate their mastery of Tai Chi movements. At the same time, students can also share their Tai Chi moves on WeChat or Learning Tong. In the second lesson of the second week, the teacher asked the group to compete to check the mastery of the tai chi movements of the previous Study.

In this study, the experimental group and the control group were designed with the same teaching content, the same teaching progress, the same venue equipment, and other conditions, by the "Shanxi Jinzhong Institute of Technology College physical education course martial arts syllabus" for two weeks of Tai Chi teaching. To ensure that the experimental and control groups had the same teaching and learning time, the teacher supervised the experimental group for independent learning of Taijiquan technical movements before class. In contrast, the control class was previewed for Taijiquan technical movements before class, as required by the teacher.

The experimental and control groups were taught by the same teacher of the school, who led the two groups separately according to the Tai Chi flipped classroom teaching content designed in this Study. The requirements of the college sports martial arts course assessment of Shanxi Jinzhong Institute of Technology conducted the Taijiquan results of the two groups. I organized the review and recorded the results. Two Shanxi Jinzhong Institute of Technology, martial arts teachers gave the final score. The teachers did not know the situation of the two groups, so the interference of teachers' subjective factors was excluded, thus ensuring the fairness and rationality of the whole assessment process. To ensure the objectivity of this experiment, we will use a single-masked investigation and will not announce the purpose of the experiment to students.

This paper aims to test the effect of the flipped classroom on students' Tai Chi performance. To ensure that the results after the experiment have good content reliability, in line with the knowledge level and ability characteristics of students in our school, this Study conducted an appropriate investigation and deletion of the difficulty and quantity of the test questions. It passed the consistency test of three experts.

### Expert verification result

This Study investigated the impact of the Flipped Classroom method on student satisfaction and performance in a higher education setting for Taijiquan. To ensure the experiment's test paper has suitable content reliability and aligns with students' satisfaction and achievement within the study domain, a comprehensive investigation and refinement of the test questions were carried out by the researcher. The test questions also successfully underwent a consistency check by three experts.

**Table 4.1** Validation of lesson plan by experts

Items	$\bar{x}$	S.D.	Level
The lesson plan contains all of the necessary elements.	4.67	0.58	Highest
The content is suited to the student's level of understanding.	4.33	0.58	Highest
The learning activities are relevant to the subject matter.	4.67	0.58	Highest
Learning activities are designed according to FLIPPED classrooms in Taijiquan sports	4.67	0.58	Highest
Learning activities are difficult and also easy to suit the level of learners	4.67	0.58	Highest
The timing of the activities is appropriate.	4.67	0.58	High
The teaching materials applied to the activities are appropriate.	5.00	0.00	Highest
Digital tools used for activities are sufficient.	4.67	0.58	Highest
Assessment methodologies are appropriate	5.00	0.00	Highest
Assessment methodologies are accurate and fair.	4.67	0.58	Highest
Total	4.70	0.47	Highest

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#### 4.2 Analysis of the Differences in Students' Achievements Before and After the An Experiment in the Experimental Class

The school involved in this Study is a private college under the Shanxi Provincial Education Commission. In general, students' test results can represent the level of most private universities in Shanxi Province, with better experimental conditions. Therefore, this school was selected as the experimental school to expand the sample to other schools for further experiments. The study subjects were chosen from five parallel classes of optional courses at the Jinzhong Institute of Technology in Shanxi Province. Then 60 students were randomly selected from these five classes. The gender distribution of students is shown in Table 3.2. This Study adopted a cluster sampling technique to carry out the learning activities of a Tai Chi flipped classroom among 60 students. The experiment was done with the consent of 60 students and their parents.

After two weeks of a teaching experiment, the researcher conducted comparative data analysis on the Taijiquan technical level and Taijiquan learning interests of the two groups of students.

**Table 4.2.1** The demographic of Respondent

Gender	Frequency	Percent
Male	67	55.8
Female	53	44.2
Total	120	100
Height (CM.)		
160-170 cm.	29	24.1
171-180 cm.	87	72.5
181-190 cm.	4	3.4
Total	120	100
Weight (K.G.)		
40-50 kg.	12	10.0
51-60 kg.	50	41.7
61-70 kg.	38	31.7
71-80 kg.	14	11.7
81-90 kg.	6	5.0
Total	120	100

Table 4.2.1 Reported the respondents' demographic, gender is 55.8 percent male; Height most is 171-180 cm. 72.5 percent, and Weight most is 51-60 kg. 41.7 percent.

**Table 4.2.2** Students in the Experimental Group

Gender	Frequency	Percent
Male	35	58.3
Female	25	41.7
Total	60	10

**Table 4.2.2** (Continued)

<b>Height (CM.)</b>		
160-170 cm.	16	26.7
171-180 cm.	41	68.3
181-190 cm.	3	5.0
Total	60	100
<b>Weight (K.G.)</b>		
40-50 kg.	7	11.7
51-60 kg.	22	36.7
61-70 kg.	21	35.0
71-80 kg.	6	10.0
81-90 kg.	4	6.7
Total	60	100

Table 4.2.2 Reported the experiment group demographic; gender is 58.3 percent male; Height most is 171-180 cm. 68.3 percent, and Weight most is 51-60 kg. 36.7 percent.

**Table 4.2.3 Students in the Control Group**

Gender	Frequency	Percent
Male	32	53.3
Female	28	46.7
Total	60	100
<b>Height (CM.)</b>		
160-170 cm.	13	21.7
171-180 cm.	46	76.7
181-190 cm.	1	1.6
Total	60	100
<b>Weight (K.G.)</b>		
40-50 kg.	5	8.3
51-60 kg.	28	46.7
61-70 kg.	17	28.3
71-80 kg.	8	13.3
81-90 kg.	2	3.4
Total	60	100

Table 4.2.3 Reported the control group demographic; gender is 58.3 percent male; Height most is 171-180 cm. 68.3 percent, and Weight most is 51-60 kg. 36.7 percent.

### 4.3 The Result of the Research

The result of learning achievement differs between students learning with FLIPPED classrooms and those who know the traditional method can illustrate in table 4.3.1 and 4.3.2

**Table 4.3.1** Group Statistics

Group	N	Mean	Std. Deviation	Std. Error Mean
Experiment Group	60	4.03	.22	.03
Control Group	60	3.13	.31	.04

**Table 4.3.2** Independent Sample Test

	Levene's test for equal variances assumed		t-test for equality of mean				
	F	Sig.	t	df.	Sig. (2Tailed)	Mean Difference	Std.Error Difference
Equal variances assumed	3.12	.080	18.30	118	.000	.903	.495

Tables 4.3.1 and 4.3.2 display the comparison of results between the Experiment and Control groups. The Experimental group scored an average of 4.03, while the Control group scored 3.13. Based on an assumption test with ZSkewness = .000, and ZKurtosis = 1.251, it can be inferred that the dependent variable is normally distributed. The covariance results for the two groups is  $F = 3.12$ , with a significance level of .080, suggesting that the variance between the two groups is not significantly different.

The t-statistic test yielded a result of 18.30, with a degree of freedom = 118 and a significance level of .000\*\*. Based on a statistical significance of .05, we can conclude that the Experiment group outperformed the Control group.

#### 4.4 The Descriptive of Students' Satisfaction

**Table 4.4** The Descriptive of students' satisfaction when using FLIPPED classrooms

Items	Means ( $\bar{x}$ )	S.D.	Result
Do you understand the subject before the flipped classroom lesson?	3.63	1.14	Satisfied
Did the in-class activities reinforce your understanding of the subject?	3.64	.98	Satisfied
Is the teacher's ability to guide you through the in-class activities?	3.64	.96	Satisfied

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**Table 4.4** (Continued)

Items	Means ( $\bar{x}$ )	S.D.	Result
Is the teacher's ability to guide you through the in-class knowledge?	3.69	1.03	Satisfied
Do you understand the subject after the flipped classroom lesson?	3.69	.97	Satisfied
Before watching the video lesson, are you familiar with the concept taught in the flipped classroom lesson?	3.61	1.00	Satisfied
The video lesson was clear and understandable in the study provided for the flipped classroom.	3.60	1.01	Satisfied
The video lesson helped prepare you for the in-class activities.	3.67	1.03	Satisfied
How confident are you in your ability to apply the knowledge learned in the flipped classroom to other situations?	3.68	.96	Satisfied
Did the in-class activities reinforce your understanding of the subject.	3.63	.97	Satisfied
Do you confidence to apply the knowledge learned in the flipped classroom to other situations?	3.67	1.00	Satisfied
Do you enjoy learning through the flipped classroom approach?	3.66	1.03	Satisfied
Did you have an excellent performance in assessments/quizzes/exams changed after experiencing the flipped classroom approach?	3.72	1.01	Satisfied
Do you enjoy learning through the flipped classroom approach?	3.63	1.00	Satisfied
Would you rate the flipped classroom approach in improving your performance in the subject?	3.62	.96	Satisfied
Average	3.652	1	Satisfied

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Table 4.4 shows the descriptive of the level of students 'satisfaction when using FLIPPED classrooms. The result found most students are satisfied when using FLIPPED classrooms.



## CHAPTER 5

### DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents (1) a Summary of the Study, (2) a Summary of the findings and Conclusions, (3) a Discussion, (4) a Conclusion, (5) Recommendations for Future Research, and (6) Limitations.

#### 5.1 Summary of the Study

##### 5.1.1 The Objectives of the Study

(1) To develop a flipped classroom for higher education students learning the sport of Taijiquan.

(2) To compare student achievement scores between flipped and traditional classroom learning.

(3) To evaluate the satisfaction of higher education students with the flipped classroom for Taijiquan movement learning.

##### 5.1.2 The Research Questions

RQ1: How to develop the specific use of flipped classrooms in teaching Taijiquan?

RQ2: Is there a difference in learning achievement between students learning with flipped classrooms and those learning with traditional methods?

RQ3: What is the satisfaction level of students when using flipped classrooms?

##### 5.1.3 The Participants of the Study

In this study, the participants were 120 students consisting of Males, 67, and 53 female students, then separated into two groups; the first group, 60 students, contained a control group, and the experiment group also contained 60 students. They come from Shanxi Jinzhong Institute of Technology in Shanxi province, China.

##### 5.1.4 The Research Instruments

These research instruments were questionnaires. Two parts of questionnaires can be used for the same participants. Each questionnaire was divided into two parts: the participant's basic background information, personal factors, and Students' achievement and Student Satisfaction; open-ended questions to survey their student's opinions.

##### 5.1.5 The Research Procedures

The primary purpose of the experiment of this Study includes two major parts.

The first part is: whether there is a difference in the learning effect of taijiquan theory and skills between the students in the experimental group and the control group under different teaching modes.

The second part is whether there is a difference in the physical changes between the experimental and control groups' students under different teaching modes.

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Moreover, the experimental design was made according to the experimental purpose, the experiment was operated according to the designed process, and the final experimental results were obtained.

## 5.2 Summary of the Finding

The Study of using FLIPPED Classroom in Taijiquan as the learning sport for students in higher education at Shanxi Jianzhong Institute of Technology. The respondents' demographic gender is (55.8%) male; Height is 171-180 cm. (72.5%), and Weight is 51-60 kg. (41.7%). Classified by groups are experiment group demographic; gender is 58.3 percent male; Height most is 171-180 cm. (68.3%), and Weight most is 51-60 kg. (36.7%). Control group demographic; gender is (58.3%) male; Height most is 171-180 cm. (68.3%), and Weight most is 51-60 kg. (36.7%). The summary of data sources and analysis methods can be found in Table 5.2.

**Table 5.2** Summary of Data Collection and Data analysis used in this Study

	Research Questions	Source of Data	Analysis Method
1.	How to develop the specific use of flipped classrooms in teaching Taijiquan?	- Questionnaires for 120 students who were in higher education at Shanxi Jianzhong Institute of Technology	- Mean - Standard Deviation
2.	Is there a difference in learning achievement between students learning with flipped classrooms and those learning with traditional methods?	- Questionnaires for 120 students who were in higher education at Shanxi Jianzhong Institute of Technology	- Mean - Standard Deviation - T-test
3.	Is there a difference in the satisfaction level of students when using flipped classrooms?	- Questionnaires for 120 students who were in higher education at Shanxi Jianzhong Institute of Technology	- Mean - Standard Deviation - T-test

The research result found that the statistical analysis conducted in this Study provided evidence to support the effectiveness of the Flipped Classroom approach. The F Wilk's lambda value of 653.323 with a p-value of .000 demonstrated a significant difference in satisfaction and achievement between the experiment and control groups. Additionally, the F-value of 938.380 with a p-value of .000\* showed that the experimental group had a higher level of satisfaction than the control group. Lastly, the F-value of 333.015 with a p-value of .000\* revealed that the experimental group had a higher achievement level than the control group. These results provide valuable insights for educators and policymakers to consider the Flipped Classroom approach as a viable option to enhance student learning outcomes.

In conclusion, the findings from this study suggest that the Flipped Classroom approach can be an effective instructional strategy. The experiment and control groups' results demonstrated significant differences in student satisfaction and achievement. Specifically, the experiment group showed more incredible pride and accomplishment than the control group. This indicates that the Flipped Classroom approach positively impacted student learning outcomes compared to traditional classroom methods.

### **5.3 Discussion**

The Flipped Classroom approach has become increasingly popular in recent years due to its potential to enhance student learning outcomes. This Study adds to the existing body of research supporting this instructional strategy's effectiveness. By providing students with pre-recorded lectures and allowing them to work on exercises and assignments during class, students can actively learn and receive personalized instructor feedback. As demonstrated in this Study, the Flipped Classroom approach can lead to higher student satisfaction and achievement levels, making it a viable alternative to traditional classroom methods. Consistent with (Strayer, 2012), the researcher found that Recent technological developments have given rise to blended learning classrooms. An inverted (or flipped) classroom is a specific type of integrated learning design that uses technology to move lectures outside the classroom and uses learning activities to move practice with concepts inside the classroom.

One possible reason for the success of the Flipped Classroom approach is its ability to cater to different learning styles. By allowing students to work at their own pace and providing them with various resources to enhance their understanding of the material, the approach can be tailored to meet the needs of individual learners. This personalized approach to learning can lead to increased engagement, motivation, and self-efficacy, all of which can positively impact student learning outcomes. Moreover, the Flipped Classroom approach can help students develop critical thinking and problem-solving skills, as they must apply their knowledge to real-world situations and collaborate with their peers. Which consistent with the (Tucker, 2012) was to compare the impact of flipped mode and traditional mode of instruction on the learning outcomes of Grade VIII school children in History and Science; 90 primary school children from Odisha (India) were randomly assigned to either of control (traditional instruction) or experimental (flipped instruction) group.

While the Flipped Classroom approach has shown promise in improving student learning outcomes, it has challenges. One of the main challenges is ensuring that students complete the pre-class work and come to class prepared to engage in active learning. Additionally, instructors must be skilled in designing effective pre-class materials and facilitating meaningful class discussions and activities. Nonetheless, by addressing these challenges and leveraging the benefits of the Flipped Classroom approach, instructors can create an engaging and effective learning environment that fosters student success.

### **5.4 Recommendation**

#### **5.4.1 Recommendation for Implementing**

1. Provide Adequate Training and Support: Implementing the Flipped Classroom approach requires teachers to restructure their traditional teaching methods. Therefore, it is essential to provide teachers with adequate training and support to help them

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successfully adopt the system. Teachers should receive guidance on developing practical pre-recorded lectures and facilitating active learning activities during class time.

2.Ensure Access to Technology: The Flipped Classroom approach relies heavily on technology, such as pre-recorded lectures and online learning needs to be more research on the practice of flipped classroom teaching model in physical education in the current Study, and even less research on flipped classroom teaching in taijiquan, and there needs to be more ensure they are familiar with the technology required to participate in the Flipped Classroom approach.

3.Encourage Collaboration and Engagement: The Flipped Classroom approach emphasizes active learning, collaboration, and engagement. Therefore, it is essential to encourage students to participate fully in class activities and to engage with their peers. Teachers who follow the development of the times promote the traditional teaching model's reform and should also provide feedback on student work and encourage students to reflect on their learning.

4.Monitor Student Progress: Implementing the Flipped Classroom approach requires ongoing monitoring of student progress. Teachers should track student participation and engagement and use formative assessments to evaluate student learning. Teachers should also provide feedback to students on their progress and use it to modify the roach if necessary.

#### **5.4.2 Recommendation for further research**

For the following research, the researcher suggested as flows:

1.Explore the Impact of the Flipped Classroom Approach on Different Student Populations: While this Study provides evidence for the effectiveness of the Flipped Classroom approach, it is essential to examine its impact on different student populations. Future research could investigate how this approach affects students with varying learning abilities or cultural backgrounds. It is essential to understand how this approach can be adapted to meet the needs of all students, regardless of their backgrounds.

2.Investigate the Impact of the Flipped Classroom Approach on Different Subject Areas in China: This Study focused on a specific subject area, and it is essential to examine the impact of the Flipped Classroom Approach on other subject areas. Different subject areas may require different approaches to teaching and learning. It is crucial to understand how the Flipped Classroom approach can be adapted to meet the needs of various subject areas.

3.Conduct Longitudinal Studies to Examine the Long-Term Effects of the Flipped Classroom Approach: While this Study demonstrated the short-term effectiveness of the Flipped Classroom approach, it is essential to investigate its long-term impact. Longitudinal studies could examine how much the Flipped Classroom approach contributes to student learning outcomes over an extended period. Such studies could provide insights into this approach's lasting effects and help determine its effectiveness in promoting student success.

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## APPENDIX

### APPENDIX A

### RESEARCH INSTRUMENTS

#### Lesson plan

**Table A.1** Classroom Activities Week 1

Start section	The sports committee will organize the team and check the dress code.
Preparation part	Start warming up
Basic part	Before class, students learn about the new course by independently watching the teaching video and conducting group research and experience independently. Then the teacher answers the questions raised by the students, demonstrates the technical movements, and points out the key and difficult points of the activities; Students practice in groups, check and correct mistakes, and give careful guidance; Correct the common problems of most students collectively.
End part	<ol style="list-style-type: none"> <li>1. Engage in relaxation activities.</li> <li>2. The students ask questions about the content of the lesson, and the teacher answers them</li> <li>3. The class is over</li> </ol>

**Table A.2** Activities at home week 1

Start section	Take a preview of Taijiquan theory and video teaching for today's class
Preparation part	Warm-up activities:
Basic part	The teacher carefully studies the teaching materials, records the technical movements as a video, and adds text and voice explanations to highlight the key points and difficulties, or intercepts standard technical movements demonstration videos from the Internet and uploads the videos to the class WeChat group, so that students can easily follow the instructions. You can watch the teaching video at any time, according to your schedule. Students can also find relevant teaching content and materials online and communicate with other students in the group at any time. The teacher should also answer the questions raised by the students.
End part	<ol style="list-style-type: none"> <li>1 One relaxation activity</li> <li>2 Summary</li> </ol>

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**Table A.3** Classroom Activities Week 2

Start section	The sports committee will organize the team, and check the dress code.
Preparation part	Start warming up
Basic part	Before the class, students review and practice the Taijiquan movements of the previous lesson, and then the teacher explains the standardization of their movements, and then starts the introduction of the new course. The students learn about the new course by watching the teaching video independently, and conduct group research and experience independently. Then the teacher answers the questions raised by the students, demonstrates the technical movements, and points out the key points and difficulties of the movements; the students practice in groups, check and correct mistakes, and guide them carefully; collectively correct the common problems of most students
End part	<ol style="list-style-type: none"> <li>1. Engage in relaxation activities.</li> <li>2. The students ask questions about the content of the lesson, and the teacher answers them</li> <li>3. The class is over</li> </ol>

**Table A.4** Classroom Activities week 2

Start section	Take a preview of Taijiquan theory and video teaching for today's class
Preparation part	Warm up activities:
Basic part	Basic part the teacher will explain and correct the mistakes of the students' movements in the previous class, and inform the students of the essentials of the movements. Then, record the content and technical actions of this lesson specified in the textbook into a video, add text and voice explanations, highlight key points and difficulties, and upload them to the classroom WeChat group, so that students can easily follow the instructions. Students can watch instructional videos at any time according to their own schedule. Students can also find relevant teaching content and materials online, and communicate with other students in the group at any time. Teachers should also answer questions from students.
End part	<ol style="list-style-type: none"> <li>1 relaxation activities</li> <li>2 Summary</li> </ol>

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### The test of students' performance

To create a performance test that aligns with the study of using FLIPPED classrooms in Taijiquan sport learning for students in higher education the test was address both theoretical knowledge and practical skills. The performance test could include the following elements:

#### Part A: Theoretical Knowledge Test

The open-end questions on FLIPPED classroom methodology:

Questions	Students Answer
1. Define a FLIPPED classroom.	
2. Describe the benefits of a FLIPPED classroom in Taijiquan learning.	
3. Discuss the potential challenges of a FLIPPED classroom approach.	
2. Describe the basic principles of Taijiquan.	
3. Describe how Taijiquan movements align with its philosophical background.	
4. Explain the importance of Taijiquan in physical and mental health.	

**Part B: Practical Skills Test**

<b>Demonstration of Taijiquan Moves</b>
1. Students will be asked to demonstrate a series of Taijiquan movements learned during the course. They will be scored based on accuracy, flow, and technique.
<b>Self-directed Learning</b>
2. Students will be asked to teach a simple Taijiquan routine to a peer, demonstrating their understanding of the FLIPPED classroom approach where students become the facilitators of learning
<b>Reflective Essay</b>
3. Students will write a brief essay reflecting on their experience with the FLIPPED classroom approach in their Taijiquan learning journey. They should discuss what they found helpful, challenging, and how it impacted their overall learning experience

The results of the performance test will then be used to measure by the effectiveness of the FLIPPED classroom approach in Taijiquan sport learning for students in higher education.

## APPENDIX B

### Lesson Plan

Section	Description
<b>Week 1: Introduction to Taijiquan</b>	
<b>Pre-class work</b>	<ol style="list-style-type: none"> <li>1. Watch online lecture video: "Introduction to Taijiquan: History, Principles, and Health Benefits."</li> <li>2. Read assigned articles on the fundamental concepts and philosophies in Taijiquan.</li> <li>3. Participate in an online discussion forum: Share thoughts and reflections about Taijiquan.</li> </ol>
<b>In-class activities</b>	<ol style="list-style-type: none"> <li>1. Q&amp;A session: Clarify doubts and misconceptions from the pre-class work.</li> <li>2. Interactive lecture: Discuss key points about Taijiquan, its philosophical aspects, and health benefits.</li> <li>3. Demonstration: Instructor demonstrates basic Taijiquan movements.</li> <li>4. Practice: Students practice basic movements under the instructor's guidance.</li> <li>5. Reflection &amp; Feedback: Students share their experiences and challenges encountered during the practice. A quick anonymous survey collects feedback regarding the effectiveness of teaching and understanding.</li> </ol>
<b>Week 2: Taijiquan Basic Movements</b>	
<b>Pre-class work</b>	<ol style="list-style-type: none"> <li>1. Watch online tutorial video: "Taijiquan Basic Movements."</li> <li>2. Read online material about the significance and proper execution of these movements.</li> <li>3. Self-practice: Try to mimic the movements shown in the video tutorial.</li> </ol>
<b>In-class activities</b>	<ol style="list-style-type: none"> <li>1. Q&amp;A session: Discuss doubts and difficulties experienced during self-practice.</li> <li>2. Demonstration &amp; Correction: Instructor demonstrates the basic movements again, corrects students' postures, and provides individual feedback.</li> <li>3. Group Practice: Students practice together to build a sense of community and learn from each other.</li> <li>4. Reflection &amp; Feedback: Students share their progress, difficulties, and how they overcame them. Collect feedback via a survey.</li> </ol>
<b>Summative Assessment</b>	
<b>End of Semester Evaluation</b>	<ol style="list-style-type: none"> <li>1. Practical Exam: Students are assessed on their ability to perform a set of Taijiquan movements with accuracy and fluency.</li> <li>2. Written Exam: Students answer questions about Taijiquan history, principles, and benefits.</li> <li>3. Student Course Evaluation: Students complete an anonymous course satisfaction survey, providing feedback on the teaching methodology, content, and overall learning experience.</li> </ol>

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### The test of students' satisfaction

To create a performance test to align with the research title "A Study satisfaction of using FLIPPED classrooms in Taijiquan sport learning for students in higher education" should involve both subjective and objective evaluation of student satisfaction with the FLIPPED classroom approach, as well as the effects on their Taijiquan learning.

#### Part A: Theoretical Knowledge and Satisfaction Survey

The open-end questions on FLIPPED classroom methodology:

Questions	Students Answer
1. Define a FLIPPED classroom.	
2. Discuss the potential benefits and challenges of a FLIPPED classroom in Taijiquan learning.	
3. How is your satisfaction with the FLIPPED classroom approach in terms of engagement, interaction, self-paced learning, etc.	
2. How is your satisfaction with the level of understanding you achieved in Taijiquan theory and practice through the FLIPPED classroom approach?	

## Part B: Practical Skills Test and Satisfaction Evaluation

<b>Demonstration of Taijiquan Moves</b>
1. Students will be asked to demonstrate a series of Taijiquan movements learned during the course. They will be scored based on accuracy, flow, and technique.
2. After demonstration, students will be asked to rate their satisfaction with how the FLIPPED classroom approach helped them master the moves.
<b>Self-directed Learning</b>
3. Students will teach a simple Taijiquan routine to a peer, showcasing their grasp of the FLIPPED classroom method.
4. Students will rate their satisfaction with this peer-to-peer teaching/learning experience and its contribution to their understanding of Taijiquan.
<b>Reflective Essay</b>
5. Students will write an essay reflecting on their experience with the FLIPPED classroom approach in Taijiquan. This should include their overall satisfaction, any challenges encountered, and perceived improvements in their learning.

The results of the performance test, particularly the satisfaction scores and reflective essays, will provide valuable insights into the students' satisfaction with using FLIPPED classrooms in Taijiquan sport learning in higher education.

## APPENDIX C

### LIST OF EXPERTS

The research instruments of the research entitled “using flipped classing in Taijiquan sport learning for students in higher education, satisfaction questionnaire.” validated by 3 experts with pre-test, post-test, and rubric score of final’s work.

1. MARTIAL ARTS expertise

Assistant Li Haiqing

Assistant, School of Shanxi Jinzhong Institute of Technology, Shanxi

331719936@qq.com

2. MARTIAL ARTS expertise

Assistant Li Qiong

Assistant, School of Shanxi Jinzhong Institute of Technology, Shanxi

170220075@qq.com

3. MARTIAL ARTS expertise

Assistant Yang Lina

Assistant, School of Shanxi Jinzhong Institute of Technology, Shanxi

289107407@qq.com

1. Lecturer Martial arts instructor expertise

2. Lecturer, Free combat coach expertise

3. Educational Technology Lecturer expertise

	Position	length of work	Position describe
Li Haiqing	Lecturer, Martial arts instructor	18 years	Engaged in physical education, guiding college students to learn martial arts.
Li Qiong	Lecturer, Free combat coach	15years	Free combat coach to guide college students to learn martial arts.
Yang Lina	Lecturer	15years	To study martial arts and guide college students to learn and train various martial arts.

## The request letter



NO. 7004/ **1296**

School of Industrial Education and Technology  
King Mongkut's Institute of Technology Ladkrabang  
1 Chalongkrung Rd. Ladkrabang Bangkok 10520

2 NOVEMBER 2022

Subject: Request for an appointment of qualified examiner instruments for research (thesis)


Dear Assistant Li Haiqing,

Mr. Zhang Yu, student ID 63603154, a master's degree student in Master of Science Program in Technology-Enhanced Learning and Innovation, King Mongkut's Institute of Technology Ladkrabang is working on a thesis title "USING FLIPPED CLASSROOM IN TAIJIQUAN SPORT LEARNING FOR STUDENTS IN HIGHER EDUCATION" with Asst. Prof. Dr. Kanyarat Sriwisathiyakun as a thesis advisor and Asst. Prof. Dr. Sirirat Petsangsri as co-advisor.

The School of Industrial Education and Technology acknowledged on your professional competence in regarding field, the faculty would like to invite you as a senior expert to evaluate on accuracy and appropriate of the content on questionnaires (IOC Checking). The recommendations and reviews from your assessment will be beneficial to the completeness of Ms. Du Juan's research.

Please consider on this invitation, the faculty is looking forward and most appreciated for your kind acceptance.

Sincerely yours,

  
(Assistant Professor Dr. Worapong Pairindra)  
Assistant Dean for Academic Affairs for Dean

International Office, School of Industrial Education and Technology, KMITL  
Email: [pongsakorn.mi@kmitl.ac.th](mailto:pongsakorn.mi@kmitl.ac.th), [wanin.wi@kmitl.ac.th](mailto:wanin.wi@kmitl.ac.th)

NO. 7004/ **1296**

School of Industrial Education and Technology  
King Mongkut's Institute of Technology Ladkrabang  
1 Chalongkrung Rd. Ladkrabang Bangkok 10520

2 NOVEMBER 2022

Subject: Request for an appointment of qualified examiner instruments for research (thesis)


Dear Assistant Li Qiong,

Mr. Zhang Yu, student ID 63603154, a master's degree student in Master of Science Program in Technology-Enhanced Learning and Innovation, King Mongkut's Institute of Technology Ladkrabang is working on a thesis title "USING FLIPPED CLASSROOM IN TAIJIQUAN SPORT LEARNING FOR STUDENTS IN HIGHER EDUCATION" with Asst. Prof. Dr. Kanyarat Sriwisathiyakun as a thesis advisor and Asst. Prof. Dr. Sirirat Petsangsri as co-advisor.

The School of Industrial Education and Technology acknowledged on your professional competence in regarding field, the faculty would like to invite you as a senior expert to evaluate on accuracy and appropriate of the content on questionnaires (IOC Checking). The recommendations and reviews from your assessment will be beneficial to the completeness of Ms. Du Juan 's research.

Please consider on this invitation, the faculty is looking forward and most appreciated for your kind acceptance.

Sincerely yours,

  
(Assistant Professor Dr. Worapong Pairindra)  
Assistant Dean for Academic Affairs for Dean

International Office, School of Industrial Education and Technology, KMITL  
Email: [pongsakorn.ni@kmitl.ac.th](mailto:pongsakorn.ni@kmitl.ac.th), [warin.wi@kmitl.ac.th](mailto:warin.wi@kmitl.ac.th)

NO. 7004/ **1296**

School of Industrial Education and Technology  
King Mongkut's Institute of Technology Ladkrabang  
1 Chalongkrung Rd. Ladkrabang Bangkok 10520

2 NOVEMBER 2022

Subject: Request for an appointment of qualified examiner instruments for research (thesis)

Dear Assistant Yang Lina,

Mr. Zhang Yu, student ID 63603154, a master's degree student in Master of Science Program in Technology-Enhanced Learning and Innovation, King Mongkut's Institute of Technology Ladkrabang is working on a thesis title "USING FLIPPED CLASSROOM IN TAIJIQUAN SPORT LEARNING FOR STUDENTS IN HIGHER EDUCATION" with Asst. Prof. Dr. Kanyarat Sriwisathiyakun as a thesis advisor and Asst. Prof. Dr. Sirirat Petsangsri as co-advisor.

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Please consider on this invitation, the faculty is looking forward and most appreciated for your kind acceptance.

Sincerely yours,

(Assistant Professor Dr.Worapong Pairindra)  
Assistant Dean for Academic Affairs for Dean

International Office, School of Industrial Education and Technology, KMITL  
Email: [pongsakorn.ni@kmitl.ac.th](mailto:pongsakorn.ni@kmitl.ac.th), [wain.wi@kmitl.ac.th](mailto:wain.wi@kmitl.ac.th)

## RESULT OF LESSON PLAN VALIDATION

Description: This lesson plan is part of FLIPPED classrooms in Taijiquan sport learning for students in higher education.

### Criteria

4.50 – 5.00 = High Valid

3.50 – 4.49 = Valid

2.50 – 3.49 = Enough Valid

1.50 – 2.49 = Less Valid

1.00 – 1.49 = Invalid

No.	Aspect	Expert			Mean Of Validity	Criteria
		1	2	3		
1	The lesson plan contains all of the necessary elements.	5	4	5	4.67	Valid
2	The content is suited for the students' level of understanding.	5	4	4	4.33	Valid
3	The learning activities are relevant to the subject matter.	5	5	4	4.67	High Valid
4	Learning activities are designed according to FLIPPED classrooms in Taijiquan sport learning for students in higher education.	4	5	5	4.67	High Valid
5	Learning activities are difficult and also easy to suit the level of learners	5	5	4	4.67	High Valid
6	The timing of the activities is appropriate.	4	5	5	4.67	High Valid
7	The teaching materials applied to the activities are appropriate.	5	5	5	5.00	High Valid
8	Digital tools used for activities are sufficient.	5	5	4	4.67	High Valid
9	Assessment methodologies are appropriate	5	5	5	5.00	High Valid
10	Assessment methodologies are accurate and fair.	5	5	4	4.67	High Valid
<b>Mean</b>					<b>4.77</b>	<b>High Valid</b>

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## IOC POSTTEST

### Satisfaction of using FLIPPED classrooms

Description:

This questionnaire is part of a study on satisfaction with the application of Taijiquan to flipped classroom learning activities. Your responses are valuable and are considered highly confidential.

Direction:

Read through the test questions in this form. Please indicate the degree to which each item is congruent with the objective of this study. If you have any comments on the congruence of each question, please record them in the space provided. Tick (✓) to rate the congruence according to the scale below.

+1 = Determined that this question is consistent with the theme of "Satisfaction with Taijiquan applied to flipped classroom learning activities".

0 = Not sure if this question aligns with the topic "Satisfaction with Taijiquan applied to flipped classroom learning activities".

-1 = Determines that the question is inconsistent with the topic "Satisfaction with Taijiquan applied to flipped classroom learning activities".

NO	Question items	Expert			ΣR	IOC	Result
		1	2	3			
	Part 1 Information of Respondents 第一部分 受访者资料 Note Please mark ✓ into ( ) in the multiple choice. 注意 请在单项选择中将√打入 ( )。						
1	Gender 性别	+1	+1	+1	3	1.00	

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	( ) Male 男 ( ) Female 女						Used
2	Height (cm.) 身高 (厘米) ( ) 160-170 cm. ( ) 171-180 cm. ( ) 181-190 cm.	+1	+1	+1	3	1.00	Used
3	Weight (kg.) 体重 (公斤) ( ) 40-50 kg. ( ) 51-60 kg. ( ) 61-70 kg. ( ) 71- 80 kg. ( ) 81-90 kg.	+1	+1	+1	3	1.00	Used
4	Course Content and Delivery 课程内容和授课						
5	The online lecture videos were clear and easy to understand. 在线授课视频清晰易懂。	+1	+1	+1	3	1.00	Used
6	The assigned readings were helpful for understanding Taijiquan principles and techniques.指定读物有助于 理解太极拳原理和技术。	+1	+1	+1	3	1.00	Used
7	The in-class sessions were well-structured and engaging. 课堂会议结构合理且引人入 胜。	+1	+1	+1	3	1.00	Used
	Instructor Evaluation 导师评价						

8	The instructor was knowledgeable about Taijiquan. 教练对太极拳有一定的了解。	+1	+1	+1	3	1.00	Used
9	The instructor was effective in demonstrating and teaching Taijiquan movements 指导老师对太极拳动作的示范和教学效果显著	+1	+1	+1	3	1.00	Used
	Peer Learning and Community 同伴学习和交流						
10	The group practice sessions were helpful for my learning. 小组练习对我的学习很有帮助。	+1	+1	+1	3	1.00	Used
11	I felt a sense of community with other students in the course. 在课程中，我与其他学生有一种归属感。	+1	+1	+1	3	1.00	Used
	Self-paced Learning 自学						
13	The pre-class work (videos, readings, and self-practice) was effective for my learning. 课前作业（视频、阅读和自我练习）对我的学习很有效。	+1	+1	+1	3	1.00	Used
14	The flipped classroom model was conducive to my learning style.	+1	+1	+1	3	1.00	Used

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	翻转课堂模式有利于我的学习方式						
15	Overall, I am satisfied with my learning experience in this Taijiquan course 总的来说，我对这次太极拳课程的学习体验很满意	+1	+1	+1	3	1.00	Used
16	What aspects of the course did you find most beneficial for your learning?你觉得课程的哪些方面对你的学习最有益?	+1	+1	+1	3	1.00	Used
17	What areas of the course do you think could be improved? Please provide specific examples?您认为课程的哪些方面可以改进?请举出具体例子?	+1	+1	+1	3	1.00	Used
18	Please provide any other comments or suggestions you have about this course?请提供您对本课程还有哪些意见或建议?	+1	+1	+1	3	1.00	Used

## IOC Satisfaction Questionnaire

### Satisfaction of using FLIPPED classrooms

Description:

This test is part of application of Taijiquan to flipped classroom learning activities.

Your responses are valuable and considered highly confidential.

Direction:

Read through the test questions in this form. Please indicate the degree to which each item is congruent with the objective of this study. If you have any comments on the congruence of each question, please record them in the space provided. Tick (✓) to

rate the congruence according to the scale below.

+1 = certain that the question is congruent with themes of Taijiquan applied to flipped classroom learning activities.

0 = uncertain that the question is congruent with themes of Taijiquan applied to flipped classroom learning activities.

-1 = certain that the question is NOT congruent with themes of Taijiquan applied to flipped classroom learning activities.

N O	Question items	Expert			$\Sigma R$	IOC	Result
		1	2	3			
Part 1 Information of Respondents 第1部分 受访者资料 Note Please mark ✓ into ( ) in the multiple choice. 注意 请在单项选择中将√打入 ( )。							

1	Gender 性别 ( ) Male 男 ( ) Female 女	+1	+1	+1	3	1.00	Used
2	Height (cm.) 身高 (厘米) ( ) 160-170 cm. ( ) 171-180 cm. ( ) 181-190 cm.	+1	+1	+1	3	1.00	Used
3	Weight (kg.) 体重 (公斤) ( ) 40-50 kg. ( ) 51-60 kg. ( ) 61-70 kg. ( ) 71-80 kg. ( ) 81-90 kg.	+1	+1	+1	3	1.00	Used
<p>Part 2 Factors Satisfaction on using FLIPPED classrooms in Taijiquan sport learning for students in higher education.</p> <p>第 2 部分 影响高等教育学生在太极拳运动学习中使用 FLIPPED 课堂的满意度。</p>							
	2.1 注意事项 请在单项选择中将√打入 ( )						
4	What grade level in college are you in? 你在大学几年级? <input type="checkbox"/> 1st grade 一年级 <input type="checkbox"/> 2nd grade 二年级 <input type="checkbox"/> 3rd grade 三年级 <input type="checkbox"/> 4th grade 四年级	+1	+1	+1	3	1.00	Used

5	<p>Have you previously experienced a flipped classroom?</p> <p>你以前体验过翻转课堂吗?</p> <p><input type="checkbox"/> Yes 是</p> <p><input type="checkbox"/> No 否</p>	+1	+1	+1	3	1.00	Used
6	<p>How many times did you watch the video lesson provided for the flipped classroom?</p> <p>翻转课堂的视频课你看了多少遍?</p> <p><input type="checkbox"/> Once 一次</p> <p><input type="checkbox"/> Twice 两次</p> <p><input type="checkbox"/> More than twice 两次以上</p>	+1	+1	+1	3	1.00	Used
7	<p>How long did you spend studying the video lesson outside class?</p> <p>你在课外花了多长时间学习视频课?</p> <p><input type="checkbox"/> More than 1 hour 一小时以上</p> <p><input type="checkbox"/> Around 30 minutes to 1 hour 约30分钟至1小时</p> <p><input type="checkbox"/> Less than 30 minutes 不到30分钟</p> <p><input type="checkbox"/> I did not study the video lesson 我没有学习的视频课</p>	+1	+1	+1	3	1.00	Used
8	<p>Did you find the video lesson helpful in understanding the subject?</p> <p>你觉得视频课对理解主题有帮助吗?</p> <p><input type="checkbox"/> Yes 是</p> <p><input type="checkbox"/> No 否</p>	+1	+1	+1	3	1.00	Used

9	<p>Did the flipped classroom approach allow you to ask more questions during the in-class activities?</p> <p>翻转课堂是否让你在课堂活动中提出更多问题?</p> <p><input type="checkbox"/> Yes是</p> <p><input type="checkbox"/> No否</p>	+1	+1	+1	3	1.00	Used
	<p>2.2 Please mark <math>\checkmark</math> into ( ) that you most agree with.</p> <p>请在您最同意的 ( ) 内打<math>\checkmark</math></p>						
	<p>Students' Knowledge学生知识水平</p>						
	<p>5=Very Satisfied非常同意</p> <p>4=Satisfactory同意</p> <p>3=Fair中间</p> <p>2=Not Satisfied不同意</p> <p>1=Very dissatisfied非常不同意</p>						
10	<p>Do you understand the subject before the flipped classroom lesson?翻转课堂课前你是否理解主题?</p>	+1	+1	+1	3	1.00	Used
11	<p>Did the in-class activities reinforce your understanding of the subject?课堂活动是否加强了你对这门学科的理解?</p>	+1	+1	+1	3	1.00	Used
12	<p>Is the teacher's ability to guide you through the in-class activities?</p> <p>老师有能力指导你完成课堂活动吗?</p>	+1	+1	+1	3	1.00	Used

13	Is the teacher's ability to guide you through the in-class knowledge?老师有没有能力指导你通过课堂知识?	+1	+1	+1	3	1.00	Used
14	Do you understand the subject after the flipped classroom lesson?翻转课堂课后你是否理解了这门课?	+1	+1	+1	3	1.00	Used
15	Before watching the video lesson, are you familiar with the concept taught in the flipped classroom lesson? 在观看视频课之前, 你是否熟悉翻转课堂所教授的概念?	+1	+1	+1	3	1.00	Used
16	The video lesson was clear and understandable in the study provided for the flipped classroom. 翻转课堂提供的学习视频课程清晰易懂.	+1	+1	+1	3	1.00	Used
17	The video lesson helped prepare you for the in-class activities. 视频课程帮助您为课堂活动做好准备	+1	+1	+1	3	1.00	Used
18	how confident are you in your ability to apply the knowledge learned in the flipped classroom to other situations. 你对自己将翻转课堂所学知识应用到其他情境的能力有多大信心学生表现.	+1	+1	+1	3	1.00	Used
	Students' performance学生表现						

19	Did the in-class activities reinforce your understanding of the subject. 课内活动是否加强了您对该主题的理解?	+1	+1	+1	3	1.00	Used
20	Do you confident to apply the knowledge learned in the flipped classroom to other situations?你有信心把翻转课堂学到的知识应用到其他情境中吗?	+1	+1	+1	3	1.00	Used
21	Do you enjoy learning through the flipped classroom approach? 你喜欢翻转课堂的学习方式吗?	+1	+1	+1	3	1.00	Used
22	Did you had an excellent performance in assessments/quizzes/exams changed after experiencing the flipped classroom approach? 经历翻转课堂后, 你在评估/测验/考试中的优秀表现是否有所改变?	+1	+1	+1	3	1.00	Used
23	Do you enjoy learning through the flipped classroom approach?你喜欢翻转课堂的学习方式吗?	+1	+1	+1	3	1.00	Used
24	Would you rate the flipped classroom approach in improving your performance in the subject? 评价翻转课堂方法在提高你的学科表现方面的作用?	+0	+1	+1	3	0.67	Used
25	Do you have any suggestions for how the teacher could improve the flipped classroom approach? (open-ended) 您对老师如何改进翻转课堂教学法有什么建议吗? (开放式回答)	+1	+1	+1	3	1.00	Used

## APPENDIX D

### The output from SPSS

Has Shown the Table of statistics test.

#### 1. Box's Test of Equality of Covariance Matrices

##### Box's Test of Equality of Covariance Matrices<sup>a</sup>

Box's M	17.282
F	5.655
df1	3
df2	2506320.000
Sig.	.001

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Group

#### 2. Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.998	28711.569 <sup>b</sup>	2.000	117.000	.000
	Wilks' Lambda	.002	28711.569 <sup>b</sup>	2.000	117.000	.000
	Hotelling's Trace	490.796	28711.569 <sup>b</sup>	2.000	117.000	.000
	Roy's Largest Root	490.796	28711.569 <sup>b</sup>	2.000	117.000	.000
Group	Pillai's Trace	.916	635.231 <sup>b</sup>	2.000	117.000	.000
	Wilks' Lambda	.084	635.231 <sup>b</sup>	2.000	117.000	.000
	Hotelling's Trace	10.859	635.231 <sup>b</sup>	2.000	117.000	.000
	Roy's Largest Root	10.859	635.231 <sup>b</sup>	2.000	117.000	.000

a. Design: Intercept + Group  
b. Exact statistic

Double-click to activate

#### 3. Levene's Test of Equality of Error Variances<sup>a</sup>

Levene's Test of Equality of Error Variances <sup>a</sup>				
	F	df1	df2	Sig.
AC_all	3.122	1	118	.080
S_all	6.130	1	118	.015

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

#### 4. Tests of Between-Subjects Effects

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	AC_all	24.480 <sup>a</sup>	1	24.480	333.015	.000
	S_all	41.067 <sup>b</sup>	1	41.067	938.388	.000
Intercept	AC_all	1535.105	1	1535.105	20882.576	.000
	S_all	1599.187	1	1599.187	36541.697	.000
Group	AC_all	24.480	1	24.480	333.015	.000
	S_all	41.067	1	41.067	938.388	.000
Error	AC_all	8.674	118	.074		
	S_all	5.164	118	.044		
Total	AC_all	1568.260	120			
	S_all	1645.418	120			
Corrected Total	AC_all	33.155	119			
	S_all	46.231	119			

a. R Squared = .738 (Adjusted R Squared = .736)

b. R Squared = .888 (Adjusted R Squared = .887)

## APPENDIX E

### Pictures of Conducting Research Experiments



Taijiquan teaching in the class

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Flipped classroom teaching, student group communication and learning



Flipped classroom teaching

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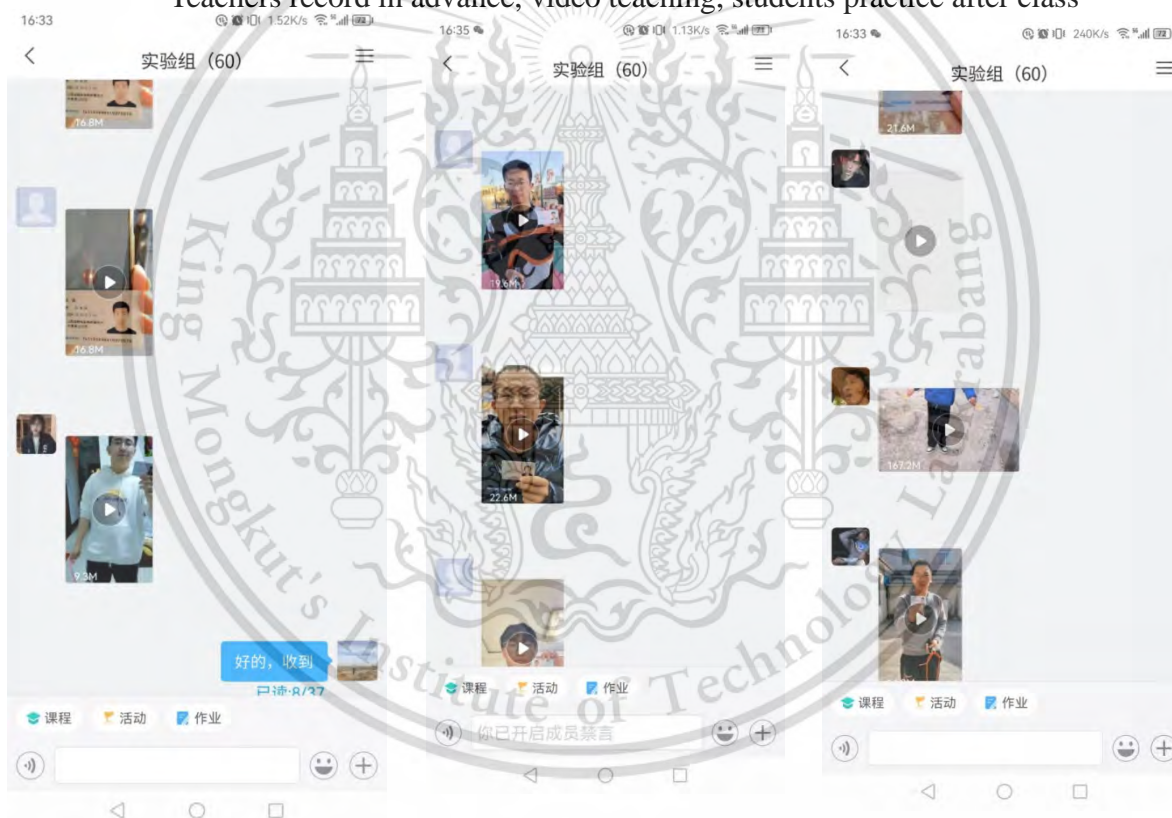
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## 24式简化太极拳前三式教学

- 1, 第一式: 起式 (视频)
- 2, 第二式: 左右野马分鬃 (视频)
- 3, 第三式: 白鹤亮翅 (视频)
- 4, 第一、二、三式连贯动作 (视频)



Teachers record in advance, video teaching, students practice after class



During the process of watching the video, students can communicate with teachers and students online through software or WeChat groups.

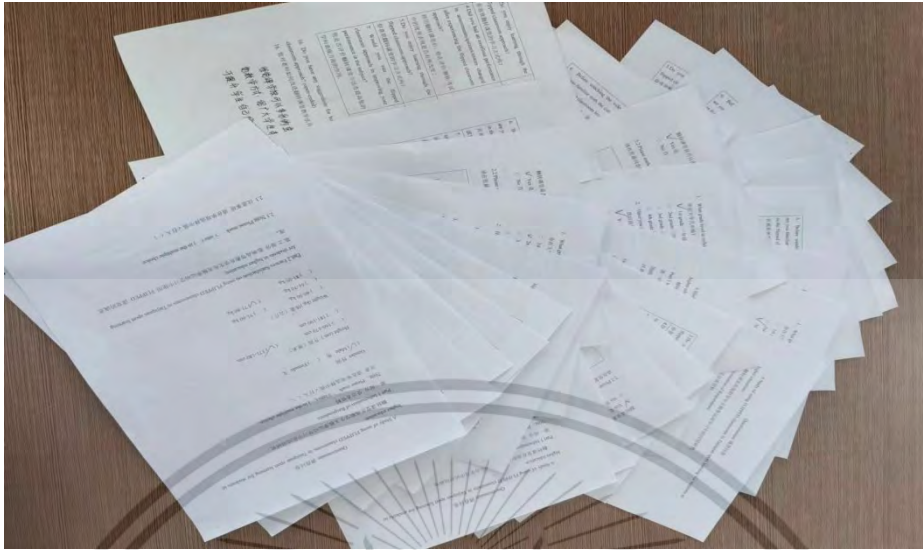
Picture are Video of students practicing Taijiquan

(The picture is from WeChat screenshot)



Student completion status, sign-in status, teacher comments

(The picture is from WeChat screenshot)



Pre-test paper



Post-test paper

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ETRAN STAR (Beijing) Information Technology Co., Ltd.

16/07/2022

To whom it may concern:

The purpose of this letter is to verify that ETRAN STAR (Beijing) Information Technology Co., Ltd. provided the English proofreading services for the following thesis :USING FLIPPED CLASSROOMS IN TAIJIQUAN SPORTS LEARNING FOR STUDENTS IN HIGHER EDUCATION

Author: ZHANG YU

The basic language editing including the correction of grammar, punctuation and syntax was performed normatively with our best efforts. And the edited document was returned to the writer on 07/072022. We are unaware of any changes or additions made to the manuscript after that time. We have kept the specimen of the received original file in case of any legal dispute.

Sincerely,

Paula Bensley

A handwritten signature in black ink that reads "Bensley".



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### **Presentations and Publications:**

Zhang Yu,Kanyarat Sriwisathiyakun, Sirirat Petsengsri and Thanongsak Sovajassatakul(2023).Using flipped classroom in TAIJIQUAN sport learning for students in higher education.