

Virtual and real integration and online learning course learning effect difference analysis during COVID-19

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Abstract

The COVID-19 epidemic has changed the way of teaching, and online distance teaching has replaced physical teaching. In the post-epidemic era, physical teaching or online and physical mixed teaching has gradually resumed. In order to solve the pain points of students' online learning data analysis courses and teachers' teaching, this study set up a sports lottery and analysis course, and formulated a positioning strategy for the 123-courses, which are 1 sports lottery analyst certificate and 2 research methods, which are action teaching Method and situational teaching method, constructing a virtual-real integrated future mobile technology teaching situational field, and three characteristic units, namely the virtual-real integrated mobile teaching unit, the situational analysis event unit, and the odds and investment unit. To verify the future mobile technology teaching situation field of virtual and real integration proposed in this study, using online teaching in 2021, 7 students will be admitted as sports lottery analysts, with a pass rate of 33.33%; in 2022, 25 students will be admitted as sports lottery analysts with the use of future mobile technology teaching situational field teaching in 2022 86.21%, showing that the effectiveness of schools with integrated virtual and actual teaching methods is much higher than that of online teaching methods.

Subject Classification: (2010) 94A17.

Keywords: Action teaching method, Situational teaching, Integration of reality and reality, Sports lottery, Data analysis.

1. Introduction

Sports big data is a very important subject in sports-oriented universities. It can be applied to improve the quality and performance of

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athletes, coach technical and tactical decision-making analysis, AI virtual coaches, sports news editing and broadcasting, broadcasting and live streaming media, Fan digital experience analysis, fan participation, fan behavior and organizational operation analysis, etc. [1, 2]. The object of this study is the students of the National Taiwan Sports and Sports University who are also athletes and often participate in competitions. Through data analysis, we can examine the strengths and weaknesses between ourselves and our opponents. According to the teaching experience of the researcher, it is found that the course is opened in the senior year. For the students, most students choose to take basic credits. They are not willing to take courses related to quantitative analysis, and the probability of failing to take the course is relatively high. Even if the class is completed, I will find a way to perfunctory in the course study, and I will not spend too much time on in-depth study, which is a pity.

This study uses the action research method to constantly reflect and correct the problems faced in the teaching field. In order to stimulate students' willingness to take classes, class is no longer a burden, and learning is from perfunctory to happy active learning. Therefore, a 123-course positioning strategy is proposed for the course design, which are: 1 professional certificate: a sports lottery analyst certificate, and the employment competitiveness of the integration of learning and application. Two research methods: action teaching method and situational teaching method, constructing a future mobile technology teaching situational field integrating virtual reality. There are 3 characteristic units: the action teaching unit integrating virtual reality, the event analysis unit of the situation, and the odds and investment unit. Students are going through the courses of three characteristic units, each student can pass the sports lottery teacher's ability, and become a sports lottery analyst who combines learning with application and has a specialization in learning. With innovative and technological teaching content and methods, students are willing to accept this course, and encourage students to actively learn and share data analysis methods.

2. Literature review

2.1 Action research related literature

Carr and Kemmis [3] put forward the action research method, which mainly has four steps, namely planning, action, observation, and reflection. Barcelona [4] collects documents, documents, and interviews with experts

on action research methods, sets out quality criteria for measuring action research methods, and then invites 5 experts to use hierarchical program analysis, which will affect the quality of action teaching methods. Guidelines are sorted, the findings are found. The first is the contribution to theory and practice, the second is the operability of research topics, and the third is the constant reflection of researchers. Wang [5] combined information technology with action research method to study the transfer of tacit knowledge of national junior badminton team with remarkable results. Huang [6] used the action research method to systematically design the dance course of the third grade of elementary school. Through the new teaching method, the use of video tape records, teaching logs and worksheets was used to study the learning effect of students. Krause et al. [7] proposed that physical education teachers should possess innovative teaching skills, attitudes, and personalities to help traditional teachers accept and make good use of the teaching techniques of action research to improve the quality of physical education teaching. Chen and Wang [8] proposed an action research method, in which researchers go deep into declining villages and towns to analyze the composition and operation mode of the characters, languages and buildings used in the cultural life of the area, and find out the stability and inheritance of regional characteristics. The cycle of culture provides the planning basis for sustainable development. Chen and Huang [9] designed six dining activities with the elderly in the Presbyterian Care Center, and found that eating together will increase the happiness and satisfaction of the elderly.

2.2 Related literature on situational teaching field

Bunker and Thorpe [10] proposed TGfU (Teaching Games for Understanding) to design games into middle school curriculum, and let students learn relevant knowledge and skills through the situational teaching of games. Later, some scholars verified the teaching method of TGfU through teaching related to sports. Both coaches and students can acquire meta-cognitive knowledge, metacognitive loops, and game performance in physical education [11, 12, 13]. Stein [14] organized Anderson et al. [15] to carry out situational learning experience activities in the classroom, based on the following four premises, respectively (1) learning is based on the behavior of daily situations, (2) knowledge can be acquired in context and only transferred to similar contexts, (3) learning is the result of social processes. In addition to declarative and procedural knowledge, context also includes thinking, perception, problem solving

and interaction. ways, and (4) learning is not divorced from the real world, but exists in a robust and complex social environment composed of actors, actions and situations. Korthagen [16] proposed that situational teaching can be divided into three models: format, structure and theory, which are used to analyze the impact between teacher's behavior and student learning.

Hong et al. [17] designed and used APP or free computer software to build a situational learning field to explore the physical theater in the Science Museum to display the physical phenomena displayed by the equipment. The study found that students who participated in the experimental situational teaching field had positive affirmations in terms of learning interest, practicality of content, and teaching effectiveness. Wang and Yang [18] In order to improve the multicultural knowledge and learning effectiveness of medical students, they implemented the intervention measures of the situational simulation teaching method in the formal education classroom, and studied the evaluation and learning effects of students. The results found that the multiculturalism of medical students after the intervention There is a significant difference in sensitivity. Wang [19] combined the curriculum design of action teaching and situational teaching. 38 college students participated in the curriculum research. The results found that the mixed curriculum design can significantly improve students' learning motivation in the two dimensions of attracting attention and obtaining satisfaction. Zhang and Chen [20] put forward the Food, Nourishing and Agricultural Creation Project, and designed 60 courses of cross-field teaching activities. It lasted three and a half years of course time, and a total of six community-based fields participated in the teaching field, Nearly 50 teachers participated and more than 2,000 students took courses. The results of the study found that university teachers and students are spontaneously interested in the designed teaching field, and the course content supports the learning and career development of teachers and students. An [21] used the situational learning framework to adapt the learning experience in physical education courses, and designed contextual learning, learners and activities for students with disabilities. Learning in social and cultural contexts.

2.3 *The use of virtual and real integration technology in teaching related literature*

Xu et al. [22] used the “Exploring Plants” unit of the natural science curriculum in elementary schools, using the physical and digital learning resources of the National Museum of Natural Sciences, to design a one-day mobile learning experience course integrating virtual reality. A total of 308 elementary school students from 20 schools participated in the course experience. After the course, the participating teachers and students affirmed the teaching method and learning effect, and at the same time added fun to the class. Wu [23] The Forbidden City cooperates with remote primary schools to integrate online audio -visual, virtual reality and 3D printing technology to develop virtual-real integrated courses to stimulate students’ memory and enrich their learning experience. Chao et al. [24] designed the teaching method of the augmented reality board game “Brave in the Black Water Ditch” based on the social curriculum of the upper grades of the elementary school. Through learning through the process of playing, the research found that students’ learning achievements and Attitude post-test scores are all improved, and there is a significant difference. Richter et al. [25] divided students into two groups of virtual reality and physical classrooms for experiments. The research found that after watching the video, the students in the virtual reality group will increase their response and self-efficacy over time, that is, virtual reality technology Can be effectively used in teaching.

Chao et al. [26] built a professional innovative learning environment that integrates virtual reality, the teaching field combines “characteristic classroom environment equipment” and “mobile learning cloud education system”, online e-books, virtual interactive simulation situations, and augmented reality Teaching material modules such as action learning editing, and learning methods such as nursing situation-oriented learning, 3D anatomical image teaching, and clinical skill testing. Fealy et al. [27] Use immersive virtual reality integration technology in nursing and midwifery education, Shea and Rovera [28] during the COVID-19 pandemic, due to the closure of the campus to suspend clinical practice, the school formulates a new virtual reality integration In the clinical internship program, the upper limit of the alternative teaching program for the virtual clinical internship hours is 50%, but there is no relevant literature in Taiwan to support relevant research on the effectiveness of this method of teaching [29]. Liao [30] discusses that in the post-epidemic era, educators should make good use of the technology and thinking of social networks, augmented reality and virtual reality in the process of

transformation in the use of digital aborigines and technological tools. Cross-field virtual and real integration teaching. Yang [31] and Liu and Liu [32] proposed to change the way of teaching due to the epidemic, and to replace physical teaching with online distance learning. At the same time, develop multiple online assessments to accelerate the transformation of digital teaching, because the equipment and teaching materials for virtual and real integration are not yet available. Ready to raise concerns about the quality of teaching.

3. Research Method

3.1 *Constructing the teaching field of future mobile technology scenarios with virtual and real integration*

Sports venues such as basketball courts, baseball fields, tennis courts, and football fields at the National Taiwan Sports University are equipped with rest spaces for coaches and players, coach research rooms, broadcast rooms, or general small classrooms. However, each space has different equipment and cannot accommodate about 30 people in class at the same time. It is necessary to properly integrate digitalization and technology for different teaching fields, so that digital equipment can be easily, quickly and effectively erected, integrated and integrated. Only by using it can it be very easy to implement the situational teaching of future mobile technology, as shown in Figure 1.

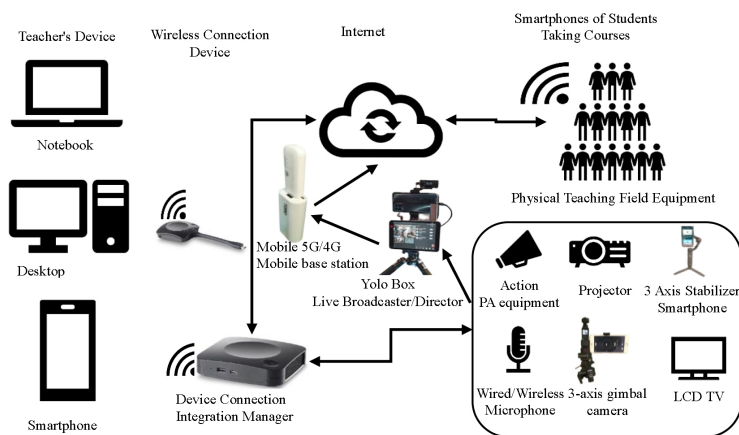


Figure 1

The teaching field of future action science and technology situation based on the integration of virtual and real

This research is based on the wireless projection and video conferencing solutions of Zhanrui Technology Co., Ltd. [33], plus the Yolo Box new generation intelligent accompanying live broadcast machine [34], which can quickly set up two-way interactive. The “future mobile technology situational teaching field” class method that integrates virtual and real, uses the equipment in the physical field, such as projectors, large LCD TVs, mobile speakers, wired and wireless microphones, 3-axis pocket pan-tilt cameras, 3-axis The stabilizer is connected to the smartphone and integrated into the new teaching platform. Due to the network of the teaching field , the same IP is limited to only 8GB of file uploads on the same day , which cannot meet the teaching needs of teaching and interacting with students in the sports venue for 2 hours of uploading . Therefore, a new platform is established to integrate the Yolo Box, 3-axis gimbal smartphone and 3- axis gimbal camera smartphone through the 4G/5G small mobile base station signal. . Then, through Bluetooth sharing technology and cross-platform software system, connect the device to the integrated manager, completely get rid of the restrictions of “signal line” and “campus network traffic” and fixed devices, and at the same time, video and audio signals can be made into pictures Switch or make a picture-in-picture screen, and send it to the students’ smart phones. In the future mobile technology situational classroom, two-way “group discussion”, “group presentation”, and “situational teaching” can be performed to realize a truly mobile future Situational classroom.

3.2 Research methods

According to this study, the 123-course positioning strategy is formulated, and the five steps of the action teaching method are used to solve the problem strategy, and the continuous reflection on this course is provided to provide better teaching content, innovative teaching methods and improve students’ learning effectiveness, as shown in the Figure 2. Aiming at the teaching method, course unit design and grade calculation method, a research framework is proposed, as shown in Figure 3.

Step 1: Find the problem

What kind of teaching content or environment will drive students to take courses in data analysis of mathematics and science? Will student learning outcomes change? In terms of course content design, in addition to being eye-catching, it is also necessary to add students’ favorite and specialty sports as the course content, and it can also be linked to job vacancies after graduation. In order to make the difficult mathematical

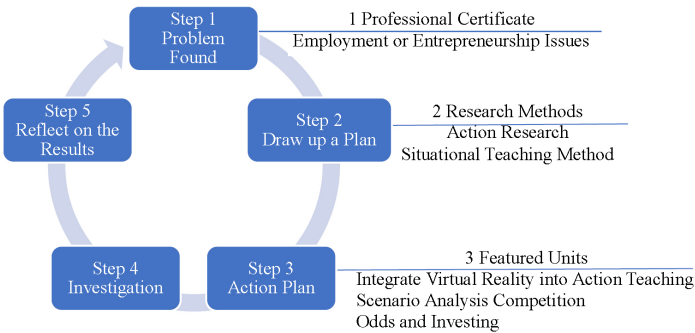


Figure 2
Problem-solving strategies and steps of action teaching method

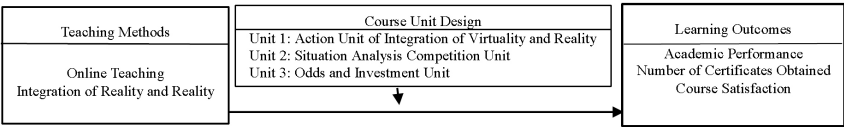


Figure 3
Research Architecture

analysis course more interesting, the course is carried out in a stress-free situation, and the happy learning course, learning environment and willingness to study hard for yourself can be taught by yourself [35]. After sorting out the 104 and 1111 job banks, the relevant vacancies in the field of sports lottery are issued: sports lottery analysts, event anchors, probability engineers, big data analysis engineers, brand event marketing planning and other related vacancies. In 2021 and 2022 , there are a total of 50 students taking courses. Using the google form to do a simple survey, it is found that the students are interested in the work. The first is the lottery analyst, accounting for 46.5%. The second is Marketing planning for brand events and events accounted for 27.9%; the third was event anchors, accounting for 16.3%, and the rest accounted for less than 10%, as shown in Figure 4. If you combine the sports that students like to watch with the categories they want to work in the future, that is, introduce the data analysis course into the sports lottery analyst as the goal of taking the course, will it increase the motivation and willingness to take the course? This study proposes:

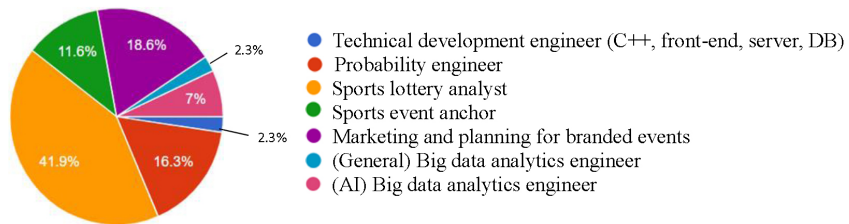


Figure 4

Statistical analysis results of sports lottery -related industries that students want to engage in before the course starts

H1: There is no significant difference between taking the entrance examination as a sports lottery analyst as a course introduction and students' willingness to take courses

Step 2: Draw up a plan

Singh et al. [36] proposed the support vector machine (SVM) model to predict the global cases, deaths, and recovery of COVID-19 during the period from January 22, 2020 to April 25, 2020. Bhatnagar et al. [37] studied the spread of COVID-19 in India and found that age was not an important factor affecting a person's exposure to COVID-19, while the patient's gender (male and female) and type of transmission (imported from other countries or imported from other countries) There is a significant relationship between local transmission). In 2021, Taiwan's COVID-19 will enter the third alert of the epidemic, and the teaching method will be changed from physical to online. In 2022, as the epidemic slows down, students will gradually return to physical classes, and if they are diagnosed, they will return to online classes. In order to reduce the risk of infection, use the action research method and the situational teaching method to build a "future action situational teaching field integrating virtual reality", and use general classrooms, computer classrooms, baseball, basketball, football and tennis and other sports venues as digital technology classrooms. Integration, transforming the physical teaching field into a scientific and digital teaching field with a practical virtual-real integration situation. Once a student is infected or at risk of contracting the epidemic, the class can be taught synchronously through the connection, breaking the traditional teacher classes are taught in classrooms and innovative teaching methods.

Step 3: Action Plan

This study proposes three characteristic unit courses, and changes the teaching field to sports venues such as baseball, basketball, football, and tennis. Guide students to share their expertise with the method of action teaching that integrates virtual and real, and no longer use traditional textbooks and teaching methods for teaching. Implementing different teaching methods will affect the effectiveness of students' learning? In response to the different teaching methods in the past two years, it is proposed

H2: There is no significant difference between different teaching methods and the learning outcomes of students certified as sports lottery analysts

Step 4: Investigate and collect evidence

After the course is over, each student will fill in the scale scales provided by the school, such as the first question is true or false, the second to 11th questions are Likert 5 and other scales, and the first and second questions are teaching evaluation questionnaires with open questions. As shown in Table 1. For H1 and H2, the Chi-square test was used to test the relationship between the two categories of independent variables using IBM SPSS 23.0 with $\alpha = 0.05$ as the significance level.

Table 1
Teaching Evaluation Questionnaire

No	Questionnaire Content
1	The motivation for taking the course is to pass the exam as a sports lottery analyst.
2	The teacher's attitude towards teaching is good.
3	The teacher expresses him/herself well and explains things clearly in this class.
4	The teacher is well prepared for the lesson, and can handle the subject and keep to the schedule.
5	The teaching is lively, and can motivate you and capture your interest.
6	The teacher understands students' level, and is willing to answer students' questions.
7	The tests, assignments or class presentations can reflect the content of the course.
8	The teacher is punctual, and if a class was canceled, a make-up class would be scheduled.

Contd...

- 9 Assessment methods are fair and reasonable.
- 10 The teacher is aware of gender equality in his/her teaching.
- 11 I am willing to recommend this class to other students.
- 12 For the whole semester course, what do the students suggest?

Step 5: Reflect on the Results

Through the teaching evaluation questionnaire, the questionnaire of industry- university dual-teacher and course questionnaire, measure the course content design, teaching method and student feedback, constantly reflect, and then improve the feasibility of the course unit of “Future Action Scenario Teaching Field of Virtual Reality Integration” evaluation and improvement methods for shortcomings. It is hoped that this course can continue to advance with the times and closely integrate with the pulse of society, so that this elective course can continue to be taught .

3.3 Instructional Design

Three course units are planned, which are the action teaching unit of virtual and real integration, situational analysis, event unit, odds and investment unit, etc., which are described as follows:

Unit 1: Action Teaching Unit of Integration of Virtuality and Reality

The course content design of this unit will integrate the target of sports lottery analysts, “Lucky Lottery Rules and Gameplay” and “Understanding and Discussion of New Rules of Various Ball Games”, combined with Taiwan lottery gameplay and sports lottery analysis test items applicable to this unit, etc. Part of the course content design . There are 12 sports events such as baseball, basketball, football, tennis, ice hockey, American football, volleyball, golf, badminton, billiards, car racing, and electronic sports. Common playing methods include: handicap, no handicap, size, double win, total number of goals, single-even, no handicap in a single quarter, no handicap in a single game, no handicap in a single set, first ball/down One goal, correct score, winning point difference, championship, special events and other announced game methods [38].

After analyzing the examination questions over the years, the four sports that appear more frequently are basketball, baseball, volleyball and football. Therefore, this study arranges these four sports venues to implement virtual and real integration teaching, and integrate the content of this unit test project. The students of the ball game will take the students who are taking the course to the stadium to share their ball games and explain the rules. Students who are not in the ball game can go to the

coach lounge or player lounge of the venue or ordinary classrooms for two-way distance communication and learning.

Unit 2: Situation Analysis Competition Unit

This unit is mainly to watch sports events and analyze sports events. To become a competent sports lottery analyst, one must be able to professionally comment and analyze the pre-match, during-match and post-match situations of the opponents. The organization of this course unit mainly focuses on the factors that affect the outcome of a game, including: stadium, climate, team, players, tactics and statistics, etc. In the part of data and tactical analysis, the sports lottery analyst test item "Basic knowledge of various ball games" is integrated into the curriculum, and according to the design of the course content, the meanings represented by the data generated by various sports events are analyzed.

Unit 3: Odds and Investment Unit

In this unit, the course content design is divided into three parts, which are (1) probability and statistics, (2) data analysis methods and (3) investment methods: equal injection method, equal profit method, double pressure method, and cycle double pressure method, Progressive injection method and Kelly Kelly method and other methods. At the same time, the examination item "knowledge of the lottery handicap" for the analysis analyst of the lottery is designed in this unit.

4. Results and discussion

4.1 Course motivation and teaching

Table 2 is the statistics of the number of certificates obtained, motivation for taking courses and teaching evaluation results of 50 students who took courses in 2021 and 2022. In the part of obtaining a certificate, there will be 7 in 2021 and 25 in 2022. According to the statistics in question 1, there are 12 students who will take the course in 2021 to be admitted as a sports lottery analyst, and 22 students in 2022, a total of 34 students. irrelevant. In the Teaching Assessment Score section, the average score on the teaching assessment of the students for the sports lottery and analysis course for questions 2 to 10 . The overall average in 2021 is 4.78, and the overall average in 2022 is 4.77. Interestingly, in the overall average of teaching evaluation, the online class is slightly higher than the integrated virtual and real teaching method by 0.01 points. However, in terms of the pass rate of students taking the certificate learning effect, the teaching

Table 2
Course motivation and teaching evaluation results

Question Number	2021	2022
	Students: 21	Students: 29
	Number of certificates obtained: 7 students	Number of certificates obtained: 25 students
	Pass Rate 33.33%	Pass Rate: 86.21%
1	12	22
2	4.78	4.84
3	4.78	4.74
4	4.78	4.79
5	4.78	4.74
6	4.78	4.79
7	4.78	4.74
8	4.78	4.74
9	4.78	4.79
10	4.78	4.79
11	4.78	4.79
Average	4.78	4.77

method of virtual and real integration 86.21%, which is much higher than the 33.33% of online teaching.

As can be seen in Table 3, there are 34 students taking courses in order to pass the sports lottery analyst certification, and 28 of them have passed the sports lottery analyst certification. A total of 6 students did not come to take the course for the purpose of being a sports lottery analyst. After the course ended, 4 students changed their original motivation for taking the course, decided to apply for the sports lottery analyst and passed the certification, and were willing to change their initial thoughts. Accounted for 33.33%. Table 4 uses the Chi-square test to test the correlation of these two proportions for further analysis. The Pearson chi-square value in Table 4 is 0.000 and less than 0.05, reaching a significant difference, indicating that there is a significant relationship between the willingness to take courses and passing the sports lottery analyst certification. Therefore, the future course can still be retained, and the goal of the course is set to be a sports lottery analyst.

Table 3
Cross-column between course motivation and passing sports lottery analyst

0		Sports Lottery Analyst Certification		total
		1		
motivation	0	12	4	16
	1	6	28	34
total		18	32	50

Motivation for taking the course: 0 is not for the sports lottery analyst test, 1 is for the sports lottery analyst test

Certified sports lottery analyst: 0 means not certified, 1 means certified

Table 4
Motivation for taking courses and passing the Chi-square test of sports lottery analysts

	value	degrees of freedom	asymptotically significant (both ends)	exact significance (both ends)	exact significance (one end)
Pearson chi-square test	15.533 ^a	1	0.000		
continuous correction ^b	13.144	1	0.000		
Likelihood ratio	15.659	1	0.000		
Fisher precision check				0.000	0.000
linear-to-linear association	15.222	1	0.000		
number of valid observations	50				
a. 0 units (0.0%) expected count less than 5. The expected lower count limit is 5.76.					
b. Calculated only for 2x2 tables					

(2) Analysis of the relationship between the teaching methods of online teaching and virtual-real integration and the learning outcomes certified by certificates

In the past two years, due to the epidemic situation, classes have been changed to online classes. In 2022, it is to reflect on the problems faced by

the online teaching field in 2021. After revision, it will be changed to a teaching method that integrates virtual reality. In Table 5, among the 50 students who took the course, 32 students obtained certificates, 7 of them were taught online, and 25 were taught through the integration of virtual and real. The chi-square test was further performed to test the correlation between the two proportions, as shown in Table 5. In Table 6, the Pearson Chi-square value is 0.000 and less than 0.05, and there is a significant difference in whether the teaching method has passed the sports lottery analyst certification, indicating that there is a significant relationship between different teaching methods and passing the sports lottery analyst certification. Therefore, in the future, we can still continue to plan to use the virtual and real integration of teaching methods.

Table 5
The cross-column of online teaching and virtual-real integrated teaching methods passed by sports lottery analysts

0		Sports Lottery Analyst Certification		total
		1		
class way	1	14	7	twenty one
	2	4	25	29
total		18	32	50

Teaching method: 1 is online teaching method, 2 is virtual and real integrated teaching method

Certified sports lottery analyst: 0 means not certified, 1 means certified

This research proposes the 123-course strategy. After analyzing the data obtained from the questionnaire and the process of action research, the results obtained are sorted out and described as follows:

(1) Motivation for taking courses in senior year

Fill in the results according to the 50 students who came to take the elective. Analysis Table 2 In the past two years , the purpose of selecting courses for seniors in the past two years is to take the sports lottery analyst exam. The number of people who took courses is 34, accounting for 68%, more than half of the number of electives. Setting the goal of the course to be a sports lottery analyst will indeed trigger students’ motivation to take the course. This result is consistent with

Table 6
Online teaching and virtual-actual integration teaching methods passed the
Chi-square test of sports lottery analysts

	value	degrees of freedom	asymptotically significant (both ends)	exact significance (both ends)	exact significance (one end)
Pearson chi-square test	14.779 ^a	1	0.000		
continuous correction ^b	12.573	1	0.000		
Likelihood ratio	15.339	1	0.000		
Fisher precision check				0.000	0.000
linear- to-linear association	14.483	1	0.000		
number of valid observations	50				
a. 0 units (0.0%) expected count less than 5. The expected lower count limit is 7.56.					
b. Calculated only for 2x2 tables					

the proposed “ Positioning Strategies for 123-Course” 1 professional certificate photo.

- (2) Aiming at the relationship between online teaching and the integration of virtual reality and the learning effect of students

The course goal of this study is to obtain the sports lottery analyst's certificate as the learning effect. The Chi-square test is used to test the relationship between online teaching and virtual-actual integration teaching. The correlation between the proportion of the two sports lottery analysts is found to be significant. In 2022, the method of integrating virtual reality teaching (25 students passed the test) is better than the learning results of online teaching in 2021 (7 students passed the test), and the number of people who passed the test increased by 3.56 times.

Analysis of the reason why the willingness to apply for online teaching is not high is because only 37.5% of the passing examinations have been passed in the past years [39]. Online teaching students are unable to interact with teachers, resulting in lack of confidence and low willingness to apply for the exam, which verifies Kounenou et al. [40] propose a perspective on the role of self-image in distance learning. However, what is interesting is that in the past two years, as long as you have applied for the certificate certification, you will pass the exam, and the pass rate of the exam certificate is 100%, which is undoubtedly the best publicity for students who want to take this course in the future. Based on this experience, if you want to implement the strategy of 1 professional certificate in this course, the teaching method of integrating virtual and real is better than the online teaching method.

5. Conclusion

5.1 *Research contributions*

After the reflection and improvement of the two courses, and the purpose of taking the course with the students who are about to graduate, find out the balance between the teaching method of this course and the learning effect of students. Students all accept the use of virtual and real integration of future mobile technology teaching fields to attend classes, and the 123-course strategy designed for this course is also highly recognized. The contributions of this study are as follows:

- (1) The reflection process of solving the problems faced by the teaching field

This study formulates the 123-course positioning strategy, proposes a mixed teaching method based on mobile teaching methods and situational teaching, problem-solving strategies and implementation of five steps, and sets up the equipment of “future mobile technology teaching field integrating virtual and real integration” through simple and fast established a teaching method of virtual and real integration of visiting action teaching. Through teaching records, continuous reflection, revision of course content, development of innovative teaching methods and performance calculation methods, so that the data analysis course can be combined with the pulse of society. The entire course design, thinking, and thinking. This research has gone through two years of continuous reflection and experience sharing with the action research method, designing more

attractive course content, and achieving a balance with students' motivation to take the initiative to take courses and learn, so that the course can be held continuously and cultivate more big data analysis talents for sports games.

(2) Solve the pain points of teachers in the teaching field

There are "Future Classrooms" classrooms in National Taiwan University, where the teaching equipment is fixed in the classroom, and cannot be moved and erected efficiently [41]. The "future mobile technology teaching field of virtual reality integration" proposed in this study can be quickly set up, suitable for different physical teaching fields, and instantly becomes a digital technology teaching field, plus 188 yuan per month 4G/5G all-you-can-eat. The mobile base station solution solves the problem of network transmission speed and image transmission limitations, and greatly improves the teaching effect and the effectiveness of students' learning.

The 3-axis stabilizer used in this research can be linked with various cross-platform smart phones or gimbal cameras. After it is set up, it will automatically track the movement of the speaker, and the camera will not shake during walking; in addition, the mobile phone, the 3-axis gimbal camera also has the same function. The two cameras can be matched with each other, so that the two cameras can automatically track the recording and transmission of class images at different angles, and there is no need to arrange a photographer to control the camera. In addition, Yolo Box combines a live broadcaster and a broadcaster in one, and it is light and compact, which is very convenient to control. It can directly record all the content of the class during the process.

(3) Solve the pain points of students buying books and copying notes in class

When taking this course, students will be very concerned about it. Do you need to buy books for class? Want to copy notes for grades? In the field of teaching, we are faced with college students with sports expertise. Facing the items sold by sports lottery tickets, some students have passed the coach qualification examination and have coach qualifications, which is different from ordinary university students. These students are very familiar with the content of the sports lottery analyst exam, game rules, basic data and advanced

data indicators, and technical and tactical analysis, and they often use it on the field. Therefore, this course decided not to use textbooks, nor to copy notes. Through the professional sharing of students, that is, students who know how to guide those who can't, students will soon memorize the rules of various ball games and data analysis. Meaning, and thinking of technical and tactical analysis, students can go to class easily, happily and without pressure as long as they bring their smartphones.

5.2 Student Feedback Suggestions and Future Research Directions

Through the feedback of the students, this course can have more flexibility under the framework of the 123-course strategy, and provide future research and course opening directions. Students' feedback and constructive suggestions can be used as research directions for future courses . Organized as follows:

- (1) If some students go out to compete, if it is a sports lottery project issued by Taiwan Lottery, the teaching field can also be directly pulled to the competition site, and the signal will be sent back to the general classroom of the school through the equipment of the future mobile technology teaching field. The analysis of court rules and techniques and tactics allows students to feel the atmosphere of the game, and at the same time cheers for the students in the game. It can also be combined with the relevant directions of the sports lottery analyst exam. In addition, let the students who compete on the field be regarded as attending the class, so that the participation methods of the course are diversified, and no more regrets about taking a public holiday.
- (2) Some students suggested that in the first unit, when visiting sports venues, we can add another teaching field, that is, at the sports lottery endorsement station, directly follow the pulse of the game, experience the betting targets of Taiwan lottery and the gameplay of Taiwan lottery, and be more able Stimulate the motivation of course selection and examination certificate.
- (3) The students suggested purchasing suitable simulated betting software, as long as the students were taught to use the relevant software, after analyzing the data, simulated betting, and then compared with the results of the game, let the students make up for the lack of technical and tactical analysis.

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