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Retraction

Retracted: AR Construction Technology of Blended English Teaching Mode in Colleges

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] X. Wu and P. Gao, "AR Construction Technology of Blended English Teaching Mode in Colleges," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 7190655, 11 pages, 2022.

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Research Article

AR Construction Technology of Blended English Teaching Mode in Colleges

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Because the educational goals set by the traditional teaching mode are too single, students gradually lose interest in learning. In the information age, there are more and more cases of various emerging technologies being applied to the field of education, and college English education should also be strengthened. The application of these technologies will help to realize the diversified development of the presentation of teaching content. AR has developed rapidly. It can help people connect with the virtual world, obtain information in real time, and apply it in teaching classrooms to help students participate in knowledge exploration and strengthen student-student and teacher-student interaction. This research designs and develops a blended English case teaching resource based on AR, applies the teaching resource to the classroom of universities, and then tests the application effect of the resource.

1. Introduction

It put forward the requirements for colleges to transform into application-oriented [1]. The Ministry of Education attaches great importance to the construction of application-oriented colleges and universities and has taken a series of measures in recent years to guide some local ordinary undergraduate colleges and universities to change to application-oriented ones and promote application-oriented colleges and universities to improve their school running level and comprehensive strength. First, we launched the project of implementing educational modernization and promoting the construction of engineering application-oriented undergraduate colleges and universities. During the "13th five-year plan" period, we supported 100 application-oriented undergraduate colleges and universities to strengthen the construction of internship, experiment, and training platforms and bases. The second is to build a cooperation platform to support the development of Applied Technology University (College) alliance. Third, the opinions on the establishment of colleges and universities during the 13th five-year plan will be issued, the application-oriented colleges and universities will be included as an important type in the establishment of colleges and universities, and the establishment, construction, and evaluation standards of application-oriented colleges and universities will be actively carried out. Fourth, promote the transformation of newly built ordinary undergraduate colleges and universities to application-oriented ones, guide the newly built application-oriented colleges and universities to focus on the cultivation of application-oriented talents, aim at the service domain, and speed up the development of characteristics. While clarifying the teaching objectives, colleges need to gradually shift the focus of teaching content from theory to practice, the test scores of professional knowledge, students' practical ability, and technical level. It will be difficult to improve students' practical ability if they continue to use the traditional teaching mode [2].

The learning of language knowledge is not simply inputting knowledge from books but also needs the support of a specific language environment. In this environment, students are more likely to understand and master the corresponding knowledge and be able to use the language knowledge better [3]. However, it is difficult for traditional

English classrooms to provide students with this context, which may lead to students not being able to understand knowledge well, or even resisting language knowledge to varying degrees. They feel that classroom teaching is boring, and language knowledge is abstract and difficult to understand [4]. English learning is through rote memorization. In addition, due to the low cognitive level of college students, it is difficult for them to independently obtain effective multimedia link resources in the environment outside the classroom, and they can only rely on teachers to teach and refer to relevant books for English learning, which may lead to students not getting appropriate knowledge input. To effectively solve the abovementioned teaching problems, it is necessary for teaching workers to make full use of their professional knowledge and skills in their daily teaching work to mine, utilize, design, and develop [5].

In recent years, new technologies represented by augmented reality (AR) have rapidly penetrated into the field of education and expanded to the field of language teaching, becoming a research hotspot [6]. Interest is the best teacher, but in daily study and life, some bitter knowledge that is difficult to understand and difficult to understand often "dissuades" students. In addition, some conceptual statements or explanations will make simple problems more complicated and not easy for students to understand. At this time, it is necessary to develop AR technology in the field of education. Compared with traditional education, integrating AR technology into education and teaching has many incomparable characteristics and advantages. The 2017 edition of "College English Teaching Guidelines" compiled by the Ministry of Education emphasizes the importance of giving play to the role of it and to promote the integration of modern [7].

Blended learning is to combine methods with E-learning, inspiring it. By combining the advantages of two or more learning methods, we can maximize the learning effect, which is a form of learning. The most representative is the combination of offline and online activities, such as face-to-face classroom courses and online (online) learning. It is necessary to give full play to the main body of it, as shown in Figure 1 below [8].

At present, the new economy, new models, and new industries for IT have been appeared, and they indicate the reform of IT, the new model of education, and the new system of IT [9, 10].

Information technology has already been used in primary school English classrooms [11]. Compared with the early technology, AR technology has more vivid, richer, and more intuitive information such as images, sounds, and animations, which creates a language learning situation for students, and captures students' attention by stimulating various senses of students [12]. Create a natural atmosphere for students to acquire English language [13]. The advantage of AR technology is that it can use rich information, to create a language learning situation and attract students' attention, and AR technology of classroom teaching, providing traditional teaching with rich teaching information and freshness. The live educational materials stimulate students' curiosity and cultivate students' strong interest in learning [14]. When using AR technology to learn, the things it shows will make the experimenter feel "get rid of the fog and see the true face." The theory that "learning is an experience of real situations" is very suitable to describe AR technology. Let the students see it with their own eyes, listen to it with their own ears, do it with their own hands, and then use their brains to think. In the whole process, students' learning initiative is enhanced, and they are more inclined to "I want to learn, I want to listen, and I want to see." Learning efficiency will also be improved a lot.

In this context, in order to conform to the new concept and new model of engineering talent training in higher education, and cultivate engineering application-oriented talents with home and country feelings, international vision, and international communication ability, promote the innovation and transformation of mode [15]. This paper will focus on the innovative research of college English teaching mode in science and engineering colleges under the support of AR technology [16].

2. Related Concepts and Theoretical Basis

2.1. Augmented Reality (AR). AR is the advanced expressions of virtual reality; so, one should understand the concept of virtual reality before understanding the concept of augmented reality technology [17].

Jaron Lanier first proposed the concept of virtual reality in 1989. He pointed out that virtual reality is a technology developed on the basis of computer, artificial intelligence, and other technologies, which can give people the experience of interacting with the virtual world [18]. The most obvious difference between those is that the information resources presented by virtual reality are all virtual, while the information resources presented by augmented reality are partly virtual and partly real [19].

Augmented reality technology incorporates a variety of modern technologies, such as smart displays, tracking registration, and human-computer interaction. The function of intelligent display technology is mainly to realize the superposition of virtual information in the real world, and its main equipment terminals include head-mounted displays, computers, and smart phones [20]. Among them, the head-mounted display has the best sense of experience for the user, because it is designed according to the structure of the human body, but because of its high manufacturing difficulty, the application range is small [21]. The mobile phone, which has been widely used around the world, has become the best choice for applying augmented reality technology [22]. The registration tracking technology can realize the position correspondence between the real thing and the virtual information. If the position of the real thing changes, the technology can also relocate to realize the superposition of the virtual information [23]. It is mainly divided into strong interaction and weak interaction. Strong interaction gives users a better sense of experience, but it is more difficult to implement, while weak interaction gives users a poor sense of experience, but it is less difficult to implement [24]. With the needs of educational development, augmented reality technology will be more widely used in the field of education, and the purchase cost will continue to be reduced. Augmented reality technology will enter the field of education and teaching in a simpler and more convenient form

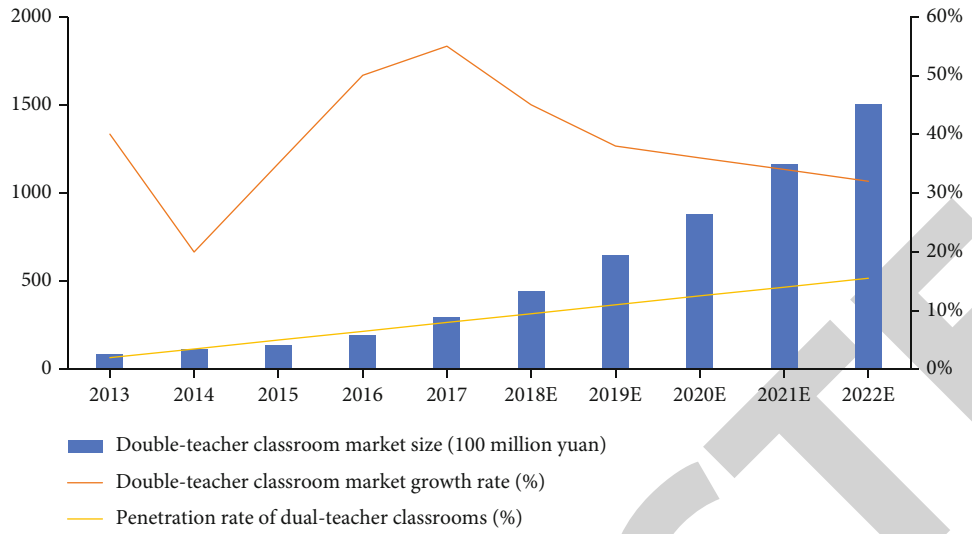

Figure 1: The development trend of blended teaching mode.

and realize the subdivision of disciplines, improve teaching quality, and promote the continuous development of modern education.

2.2. Classification and Characteristics of AR Teaching Resources. AR teaching resources are materials based on augmented reality technology. The specific types as follows:

2.2.1. Classification by Teaching Method. Inquiry-based teaching resources to students' autonomy are as follows: this type of teaching resources pays great attention to the students' self-inquiry spirit. Teachers are a guide in the process, helping students to operate, enhance their sense of experience, and then understand and consolidate knowledge to obtain better learning effects [25].

Demonstration teaching resources that play a leading role in teachers. Teachers present augmented reality teaching resources to students in the form of screen projection. This type of teaching resource presents abstract knowledge content to students in a concrete form.

2.2.2. Categorize by Interaction. Here are the two following resources: media-displayed teaching resources: use augmented reality to present educational content in the form of 3D models, animations, videos, and more. Dynamic interactive teaching resources: adding interaction on the basis of media display enhances the user's sense of immersion and interaction and helps users better understand complex abstract knowledge.

2.2.3. Classification by Identification Method. Image recognition teaching resources are as follows: the user directly scans the relevant identification map to obtain the corresponding virtual resource.

Real-life/object recognition teaching resources are as follows: the user directly uses the real scene/object as the recognized object and then uses the teaching resource in space.

2.3. The Application of AR Technology in the Field of Education and Teaching. It needs the support of relevant theories. By sorting out that the main theoretical foundations of AR education application include situational cognition theory, teaching media concept, second language acquisition theory, constructivism teaching theory, embodied cognition theory, and immersion learning theory, as shown in Table 1, the development of these theories provides strong support for the implementation of AR educational application. Therefore, the author selects four main theories for relevant analysis.

2.3.1. Situational Cognition Theory. According to the theory of situational cognition, it can be known that when people perform various activities, they are not simply based on their various perceptions of the world but are carried out in the process of continuous contact with the environment. Therefore, human behaviors are affected by the influence of various factors, mainly including social, physical, and cognitive factors. Therefore, when designing and developing resources, educators cannot be separated from the environment of learners and only pay attention to learners' reasoning awareness and cognitive level. Therefore, in the process of teaching activities, teachers should combine the knowledge content with the practical experience of learners, so as to realize the interaction between learners and real situations, and then improve the teaching effect.

However, in China, most students do not have an English conversation object and corresponding context; so, it is very necessary to create a realistic dialogue situation for students. At the same time, some researchers found that many students like to role-play in the context created by the teacher, because in this environment, students are separated from the long-lived Chinese environment, but in a novel context; so, the enthusiasm for learning can be effectively stimulated, thereby improving the learning effect.

2.3.2. Constructivism Teaching Theory. Since the 1980s, constructivism has not only had a profound impact on Western scientific and philosophical thought but also influenced the development of educational and teaching thought. The core of constructivism theory is student-centered, which advocates the cultivation of students' autonomous inquiry ability,

Table 1: Technologies for AR applications.

Display technology	3D/2D (display display/projection display)	AR
Network system	High-speed network transmission, usually >4 M/S	AR
Input system	Voice input and output technology	AR
Big data	Fast data processing	AR
Image display	Real-time 3D graphics computer processing technology	AR
Scan system	Scan real objects	AR
Recognition system	Identify based on real objects	AR
Virtual reality technology	Combining real and virtual objects	AR

so that students can actively discover problems and build their own knowledge system.

Constructivism theory mainly has three viewpoints, namely, knowledge view, learning view, and teaching view. The concept of knowledge means that students should treat knowledge with a questioning attitude in the process of learning. They should not regard knowledge as immutable but should look at it from a developmental perspective. Transform passive learning into active learning and build one's own knowledge based on existing knowledge and experience under the guidance of teachers; teaching concept means that teachers should play their leading role and continuously guide students to discover and solve problems independently and build their own knowledge system.

Constructivism theory emphasizes situational teaching, and modern high-tech provides strong support for the creation of specific situations, thus promoting it and making constructivist theory a guide for domestic and foreign researchers to conduct research. There is an important guiding theory for education and teaching research. Therefore, the construction process of meaning learning is not a simple process of inputting and accumulating information, but a process in which learners repeatedly and bidirectionally adjust and reconstruct their existing knowledge and experience and newly acquired knowledge and experience.

2.3.3. Second Language Acquisition Theory. There are various aspects of second language acquisition, that is, second language learning. Among these research results, the most influential is American linguistics. The surveillance theory is proposed by Krashen. This theory mainly includes three hypotheses, namely, the acquisition, the affective transition hypothesis, and the monitoring hypothesis.

In the history of the development of English teaching research, many researchers have tried to use the acquisition theory to guide the creation of the language environment, thereby promoting it and at the same time making some new teaching methods emerge.

2.3.4. Immersive Learning Theory. In 1975, Csikszentmihalyi proposed that immersion is a state in which people concentrate their attention and are completely undisturbed by other factors when they perform certain activities. In this state, people will block all irrelevant factors and show sufficient engagement and pleasure that are at their peak intrinsic motivation and the best time for people to acquire knowledge.

In the immersion state, the learning experience obtained by the students is better, and a good learning experience can also prolong the maintenance time of the students' immersion state. Therefore, in the specific learning process, learners should be provided with a more authentic learning experience, so that students can more easily enter the immersion state and obtain better learning effects. From the two elements of immersion theory, namely, challenge and skill, it can be seen that the learning experience we provide to students must not only meet the students' existing cognitive level but also have certain challenges, so that students can improve their personal skills while entering a state of immersion. Skill.

3. Technology

3.1. Blended Teaching Curriculum Design Technology. College English teaching goals are as follows: to be able to use English for general oral and written communication in future-related business activities, improve comprehensive cultural literacy, cultivate students' professional ability, and lay a good foundation for it.

On the occasion of the freshmen's admission, the author conducted a discussion with the taught classes to understand their English learning needs. The results are summarized as follows: pass CET-3, if possible, pass CET-4; improve oral English ability and be able to use English oral and written communication; teachers guide, give directions, and provide learning resources; more time for independent study; and teachers or classmates can provide timely guidance and answer questions when encountering problems.

3.2. Augmented Reality (AR) Underlying Technology. All objects in the real world have three-dimensional attributes, and things can be abstracted into an object point with spatial attribute coordinates. The link connecting the three-dimensional space target with the two-dimensional plane graphics is the coordinates. After undergoing dimensionality reduction operations such as projection transformation and the virtual information, the initial three-dimensional coordinate form is finally converted into the two-dimensional coordinate form on the user's screen. In summary, it is divided into the following steps:

Data preprocessing, internal parameter calibration, pose information solution, and virtual information superposition.

The tracking registration process is the process of determining the relative positional relationship between the virtual information and the real environment in real time and

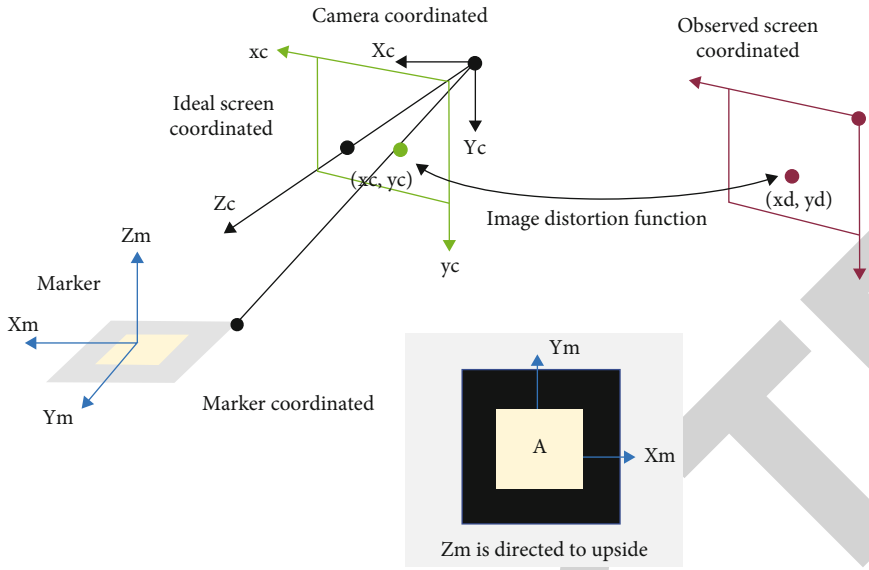

Figure 2: Imaging coordinate model diagram.

projecting the information in the user's field of vision onto the user's display screen. This paper designs an ideal imaging coordinate model as shown in Figure 2 below:

The detailed solution steps of the conversion relationship Π of the scene object point Q in the coordinate system are as follows:

(1) Assuming that the point is the GCS2000 national coordinate system, the point coordinates are first converted into space rectangular coordinates, and the coordinate conversion formula is obtained

$$\begin{aligned} X &= (u+v)\cos\beta_{2000}\cos\gamma_{2000}, \\ Y &= (u+v)\cos\beta_{2000}\sin\gamma_{2000}, \\ Z &= \left[u\left(1-l^2\right)+v\right]\sin\beta_{2000}, \end{aligned} \tag{1}$$

in

$$u = \frac{a}{\sqrt{1-l^2\sin^2\beta}}. \tag{2}$$

(2) Then perform Gaussian projection on the space rectangular coordinates (X, Y, Z) and convert the space coordinate system into the world coordinate system (X1, Y1, Z1)

$$\begin{aligned} x = X &+ \frac{N}{2}\sin B\cos BI^2 + \frac{N}{24}\sin B\cos^3 B\left(5-t^2+q\eta^2+4\eta^4\right)I^4 \\ &+ \frac{N}{720}\sin B\cos^5 B\left(61-58t^2+t^4\right)I^6, \end{aligned} \tag{3}$$

$$\begin{aligned} y = N\cos BI &+ \frac{N}{6}\cos^3 B\left(1-t^2+\eta^2\right)I^3 \\ &+ \frac{N}{120}\cos^5 B\left(5-18t^2+t^4+14\eta^2-58t^2\eta^2\right)I^5. \end{aligned} \tag{4}$$

(3) The elevation in the GPS coordinates is the coordinate Z1 under the world coordinate system; so, the process has transformed the coordinates of the object point into the representation of the world coordinate system, in the following specific embodiments

The detailed solution steps are as follows:

(1) This paper adopts the tracking and registration solution based on natural scene features, and the final form of the dynamic tracking matrix can be transformed into the transformation form of the rotation and translation matrix:

$$\begin{bmatrix} X_T \\ Y_T \\ Z_T \end{bmatrix} = \begin{bmatrix} R & T \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} X1 \\ Y1 \\ Z1 \\ 1 \end{bmatrix}. \tag{5}$$

(2) [XTYTZT] ($T$is the subscript, this is a transposed matrix, and it is too uncomfortable to type) represents the coordinates of the object point Q in the dynamic tracking coordinate system; R and T represent the world coordinate system and dynamic tracking, respectively. There are relative position and attitude between coordinate systems, where R

is the rotation matrix around the coordinate axis, and T is the vector

The detailed solution steps for the conversion relationship Ψ from the dynamic tracking coordinate system to the human eye coordinate system are as follows:

(1) Because the smartphone device used in the dynamic tracking registration has a fixed position offset relationship with the human eye, it can be represented by the corresponding rotation and translation matrix $[R'T']$. Bring the rotation-translation matrix $[R'T']$ into

$$\begin{bmatrix} X_C \\ Y_C \\ z_C \end{bmatrix} = \begin{bmatrix} R'T' \end{bmatrix} \begin{bmatrix} R & T \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} X1 \\ Y1 \\ Z1 \\ 1 \end{bmatrix} = \begin{bmatrix} R'T' \end{bmatrix} \begin{bmatrix} X_T \\ Y_T \\ Z_T \end{bmatrix}. \tag{6}$$

(2) In the above formula, [XCYCZC] (C is the subscript) represents the coordinates of the object point Q in the human eye coordinate system, which is a fixed value, which can be solved by calibrating the relative positional relationship of the smartphone

The detailed solution steps of the conversion relationship Γ from the human eye coordinate system to the projected plane coordinate system are as follows:

(1) The transformation matrix of this process can be solved by the parallel relationship of the coordinate axes in the above figure (imaging model figure), combined with the similar triangles in the plane geometry. From the properties of similar triangles:

$$\frac{z_C}{L} = \frac{X_C}{x} = \frac{Y_C}{y} = \lambda, \tag{7}$$

(2) x and y of (x, y, L) represent the plane coordinates of the intersection of the object point Q on the projection plane, L is the vertical distance between the human eye and the smartphone and is a fixed proportional coefficient that is not 0. The formula is converted to homogeneous matrix form:

$$\begin{bmatrix} x \\ y \\ 1 \end{bmatrix} = \frac{1}{\lambda} \begin{bmatrix} X_C \\ Y_C \\ z_C \end{bmatrix} = \frac{1}{\lambda} \begin{bmatrix} R' & T' \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} R & T \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} X1 \\ Y1 \\ Z1 \\ 1 \end{bmatrix}. \tag{8}$$

(3) $[xy\ 1]$ (transpose matrix) is the homogeneous coordinate of the object point Q in the projected plane coordinate system, and its measurement unit is length. It is also necessary to convert the projected plane to the pixel unit coordinate system of the smartphone screen. The relationship between the two is shown in Figure 3, and the conversion relationship is as follows:

$$\begin{bmatrix} f_u \\ f_v \\ 1 \end{bmatrix} = \begin{bmatrix} \frac{1}{dx} & \tan\gamma & u_0 \\ 0 & \frac{1}{dy} & v_0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}. \tag{9}$$

(4) (fu, fv, 1) are the homogeneous coordinates of the Q point in the system, that is, the number of pixel rows and columns; dx and dy represent the physical length of the unit pixel coordinates in the x-axis and y-axis directions; (u0, v0) (0 is the subscript) is the description of the origin in the system, which is regarded as a constant, and γ represents the pixel coordinate oblique distortion angle

(5) From this, the general relationship of the three-dimensional feature recognition points in the indoor scene in the image pixel coordinate system is solved

$$\begin{aligned} \begin{bmatrix} f_u \\ f_v \\ 1 \end{bmatrix} &= \begin{bmatrix} \frac{1}{dx} & \tan\gamma & u_0 \\ 0 & \frac{1}{dy} & v_0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ 1 \end{bmatrix} \\ &= \begin{bmatrix} \frac{1}{dx} & \tan\gamma & u_0 \\ 0 & \frac{1}{dy} & v_0 \\ 0 & 0 & 1 \end{bmatrix} \frac{1}{\lambda} \begin{bmatrix} R' & T' \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} R & T \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} X1 \\ Y1 \\ Z1 \\ 1 \end{bmatrix}. \end{aligned} \tag{10}$$

In the actual test, the physical oblique distortion angle γ of the smartphone pixel is approximately zero; s, tanγ is

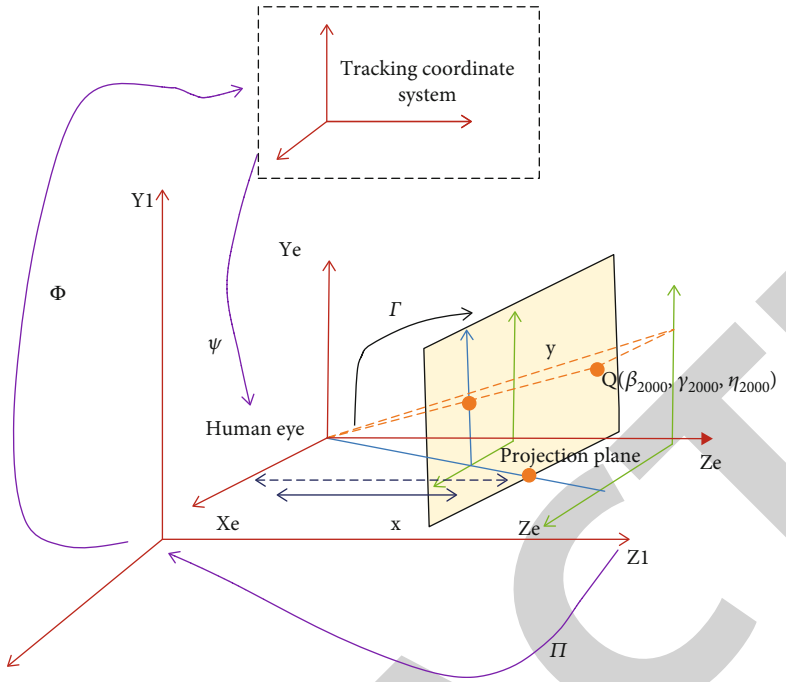

Figure 3: Conversion diagram between image coordinate system and pixel coordinate system.

approximately 0 and (X1, Y1, Z1) T (T is the transpose matrix index, 1 is the subscript) is any in the scene. For an object point, after determining the origin of it, the pixel coordinates of any point on the display screen of the smartphone can be calculated according to the above formula.

(6) From the above formula, the parameter values of the matrix A are all constants, which are only related to the structure of the smartphone device, and are called the internal parameter matrix. The internal parameters are collectively referred to as S, and R and T represent the smartphone used by the user relative to the world coordinate system. The position and direction of its parameter values change with the user's position in the indoor scene during the registration process. The Tcw after merging the two matrices is called the external parameter matrix

It is stipulated that the plane coincides with the $Z = 0$ plane in the world, and then the point Q (X1, Y1, 0, 1) (1 of X and Y is the subscript), and the relationship between the Q point in the m-th frame image can be expressed by the following formula:

$$\begin{bmatrix} f_u \\ f_v \\ 1 \end{bmatrix} = \xi \begin{bmatrix} \partial_x & 0 & u_0 & 0 \\ 0 & \partial_y & v_0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} R' & T' \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} R & T \\ 0^T & 1 \end{bmatrix} \begin{bmatrix} X1 \\ Y1 \\ 0 \\ 1 \end{bmatrix}. \tag{11}$$

The 3*3 matrix maps the Q point on the $Z = 0$ plane in the real world to the m-th frame image, which is called the homography matrix, and the subscript 1 represents the world coordinate system. The homography matrix is calculated by the following formula:

$$X_i = \begin{bmatrix} X1 \\ Y1 \\ Z1 \\ 1 \end{bmatrix}, \; x_i = \begin{bmatrix} fu \\ fv \\ 1 \end{bmatrix}, \tag{12}$$

so that it can be found

$$r_{11}^2 + r_{12}^2 + r_{13}^2 = 1, r_{21}^2 tr_{22}^2 + r_{23}^2 = 1, r_{11}r_{21} + r_{12}r_{22} + r_{13}r_{23} = 0. \tag{13}$$

The following formulas can be derived:

$$\begin{aligned} \frac{n_{11}n_{12}/\left(\partial_x^2 + n_{21}n_{22}\right)}{\partial_y^2 + n_{31}n_{32}} &= 0, \\ \frac{\xi\left(n_{11}^2/\partial_x^2\right) + n_{21}^2}{\partial_y^2 + n_{31}^2} &= 1. \end{aligned} \tag{14}$$

From the above formula (14), the two formulas can be eliminated ξ, and combined with the formula (13), ax and uy (x and y are subscripts) can be obtained, so as to obtain the internal parameter matrix of the smartphone:

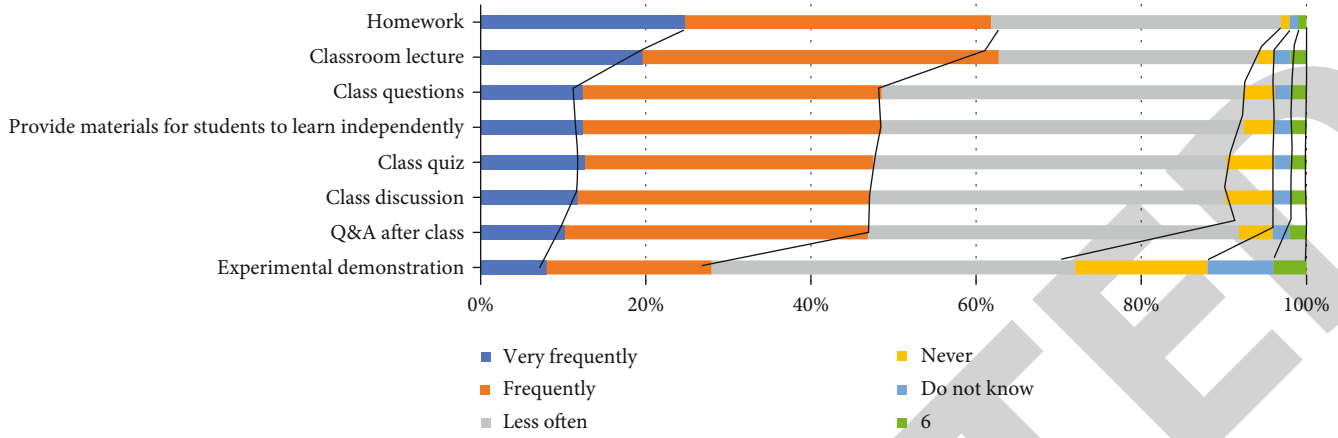

Figure 4: Analysis of learning effect under the blended English teaching mode.

Table 2: Comparative analysis table of learning interest dimension between experimental class and control class.

Item	Experiment class ($N = 47$) $M \pm SD$	Control class ($N = 48$) $M \pm SD$	t	Sig
Q4	4.470 ± 0.584	4.190 ± 0.762	2.011	0.047
Q5	4.450 ± 0.583	4.040 ± 0.849	2.705	0.008
Q6	4.300 ± 0.587	4.000 ± 0.715	2.218	0.029
Overall learning interest	4.404 ± 0.347	4.076 ± 0.431	4.080	0.000

$$A = \begin{bmatrix} \partial_x & 0 & u_0 \\ 0 & \partial_y & v_0 \\ 0 & 0 & 1 \end{bmatrix}. \quad (15)$$

At this point, the transformation of object points in the real world to the pixel coordinates of the user's mobile phone screen is completed.

4. Design and Development of Blended English Teaching Mode in AR Colleges

4.1. Construction of a Blended Teaching Model. The purpose of the blended English teaching (online + offline) model based on AR technology is to realize the method, inquiry. Teacher-centered "teaching structure" is to build a new "dominant-subject combination" teaching structure. This SPOC-based blended learning is not a simple classroom face-to-face learning and online self-directed learning but an organic integration of the two teaching modes of "learning-based" and "teaching-based," which complement and penetrate each other. It is a kind of deep blended teaching, which can be called integrated blended teaching.

The author conducted the reform in 4 pilot classes (150 students), including the satisfaction of the overall mixed model, the satisfaction of the smart campus college English online course, and the college English Three aspects of classroom face-to-face satisfaction. Judging from the survey results, most students (86%) are satisfied with the current blended English teaching model, of which 82% are satisfied with online courses and 90% are face-to-face in offline classes. The data shows that the pilot program of "Blended English Teaching Based on AR Technology" in our school was successful and was generally recognized by students.

4.2. Application of AR College English Teaching Mode. During the experiment, the experimental class used the developed "Let us eat" teaching resources. The scientificity of it as much as possible, the teaching of it, and the control class is the same except for the use of teaching resources, and other external factors are the same.

4.2.1. Analysis of Learning Effect. It can be seen from Figure 4 about the learning effect after classroom teaching. At the same time, the analysis of the survey results of homework assignment and classroom teaching shows that the students in the experimental class are different in the control class in terms of word mastery and dialogue application, and the experimental class has a higher level.

4.2.2. Analysis of Learning Interest. It can be seen from Table 2 and Figure 5 that after the classroom teaching, the two classes have significant differences in the dimension of learning interest (Sig = 0.000 < 0.05), and the class has obvious interest in learning in this class which is higher than that of the control group, which indicates that the "Let us eat" case teaching resource can improve learning.

According to Table 2, $t = 3.123$, and Sig = 0.002 < 0.05, which show that the scores of the two classes and the scores of the experimental class are significantly. It shows that the AR primary school English teaching resources designed in

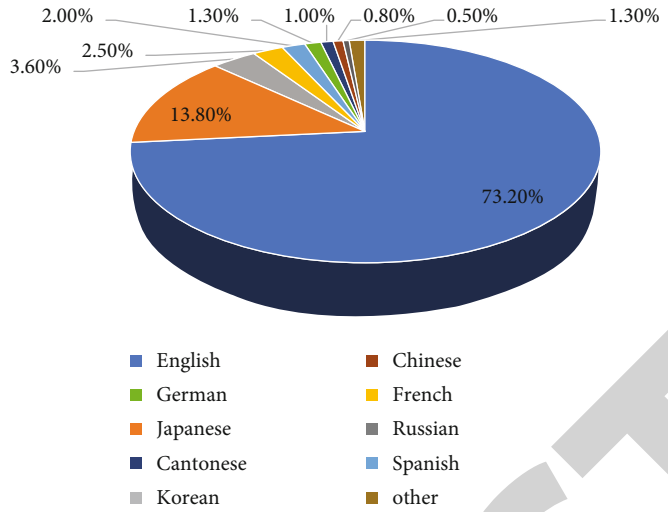

Figure 5: Comparative analysis of college students' learning interests under the blended teaching model.

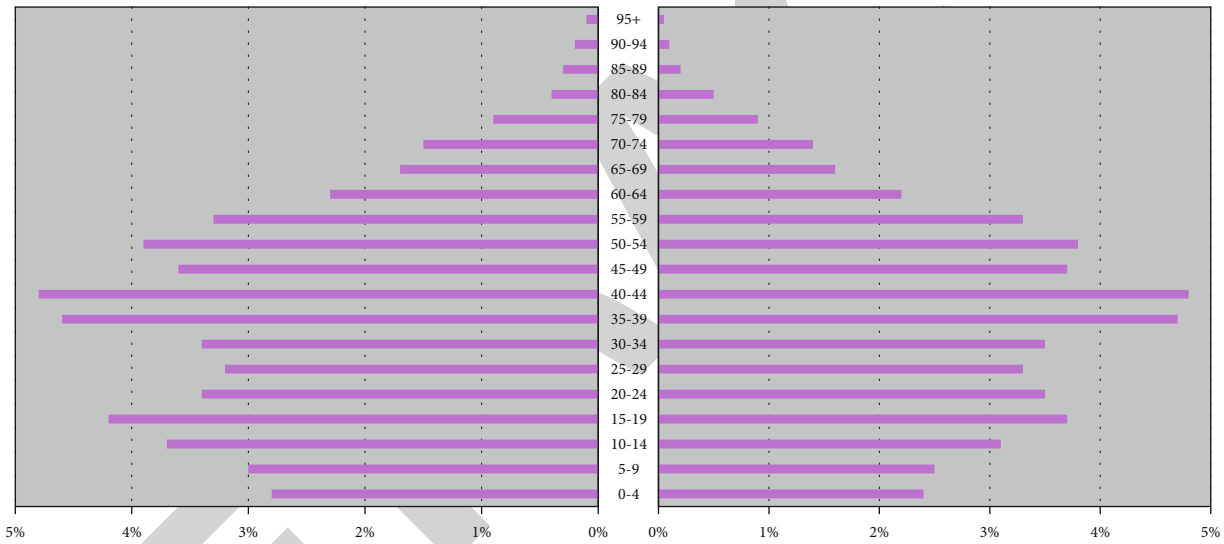

Figure 6: Statistical chart of the distribution of the number of boys and girls.

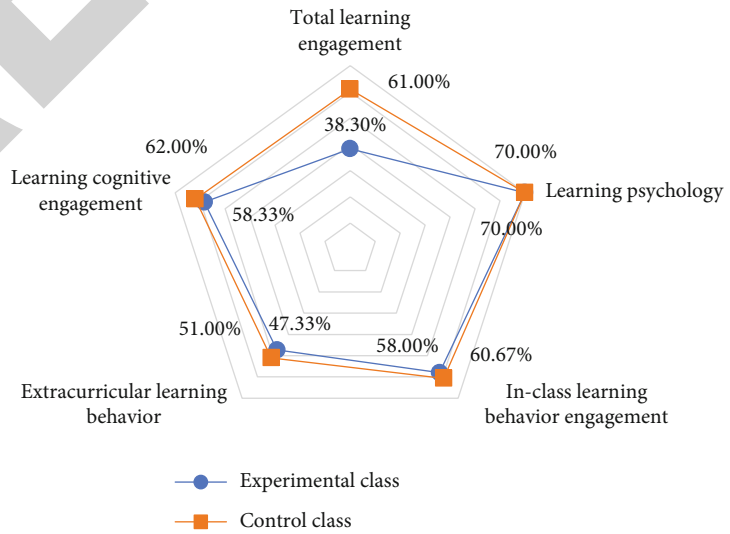

Figure 7: Data graph of learning activity satisfaction results.

this study have a certain improvement effect on students' performance. According to the difference between the scores of these two classes, the author conducted it on the scores of these two classes as shown in Figure 6.

4.2.3. Analysis of Satisfaction with Learning Activities. As shown in Figure 7, after the classroom teaching in these two classes, in the overall teaching activities of the students, they are more satisfied with the learning activities than the students in the control class. By analyzing the relevant statistical results, the difference between the two classes in this dimension mainly comes from Q8 (8. I think the teaching resources in this class are very rich) and Q9 (9. I think the dialogue situation in this class can help us learn English conversations), it can be seen that the reason for it is mainly due to the students' satisfaction with the richness of resources and the dialogue situation in the "Let us eat" teaching resources.

They are significantly more satisfied with learning activities than the students in the control class, mainly in terms of their satisfaction with learning resources and dialogue situations.

5. Conclusion

The construction of "new engineering" promotes the comprehensive reform and innovation of engineering talent training mode in colleges. In order to better cultivate international engineering application talents, science and engineering colleges need a high-quality college English teaching paradigm. This paper focuses on AR technology, expounds the logical rationale for the modern teaching, and combines the new requirements for talent training in it, the possibility of the transformation of college mode, and the feasible strategies in the teaching implementation process. A specific discussion is carried out to reflect on the current college English teaching, hoping to provide inspiration for the innovation of college mode in the future. Future research will focus on empirical research of second language virtual learning platforms, the construction of special-purpose corpora in virtual platforms, and the challenges (such as engineering ethics and network security) that will be faced after the technology is actually implemented.

Data Availability

The figures and tables used to support the findings of this study are included in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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