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Computer-Aided Design AND APPLICATIONS

Research on English Teaching Resource System and Mixed Curriculum Reform Based on Anxiety Healthcare and Virtual Reality

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Abstract: Research on the healthcare for learning psychological anxiety in the context of English teaching resource systems and blended course reform should take into account a variety of factors to create a more inclusive and supportive learning environment. The traditional English long-distance multimedia teaching system has poor interaction ability, which leads to the low enthusiasm of students for English learning. Therefore, the design of a virtual reality (VR)-based English long-distance multimedia teaching system is designed in this article. The system uses a 3D scanner to assist in the modeling by means of three-dimensional detection, uses a small plane to simulate the physical surface, adjusts the module size in the virtual teaching scene with reference to the error function, and adjusts the module pixels according to the pixel resolution calculation equation to build a virtual scene. On the basis of the mixed curriculum reform of teaching resources, AHP technology is used to evaluate English teaching quality and reflect the teaching ability level. The English teaching quality level is divided into three levels: under-standard, standard, and high-quality products, and it is used as the output of KH-KELM. Through the expert scoring method, 18 English teaching quality evaluation secondary index data are obtained and used as the input of KH-KELM to improve the accuracy of English teaching quality evaluation and provide new methods and approaches for English teaching quality evaluation. Compared with the traditional English distance multimedia teaching system, the designed resource-mixed curriculum reform system's experimental results have stronger human-computer interaction capabilities, and students' learning interest is stronger.

Keywords: English teaching; mixed curriculum reform; Anxiety healthcare; nuclear extreme learning machine
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1 INTRODUCTION

Virtual reality (VR) technology can simulate the real environment into a three-dimensional dynamic model, allowing users to immerse themselves in the environment without being restricted by space or time. Applied to the education industry, creating a teaching environment of "autonomous learning and human-computer interaction" can enhance students' interest in learning and enhance their ability to master knowledge. Therefore, an English teaching system based on VR technology is designed [1]. The system breaks the traditional teaching concept, transforms students' passive learning into active learning, and transforms modular English knowledge into dynamic virtual scenes; students can improve their English application ability through dialogue with virtual characters; human-computer interaction allows students to teach Ask questions in the system in real-time, and the system will feedback the questions to the students or teachers, realizing a diversified teaching method [2].

In recent years, as people's educational concepts have changed and upgraded, various educational games have emerged one after another. Among them, educational games built with VR technology are particularly eye-catching [3]. Katherine Prince, Senior Director of Strategic Forecasts at Knowledge-Works, said: "We hope that educators can use it to critically think about how to use emerging technologies to meet the unique needs of students." In the context of advancing globalization and reforming the education industry in the new era, the combination of English learning and gamification learning is the general trend. The case game "In Order To Dr." mentioned in this research is an English educational game created with Unity3D as a tool and combined with VR technology, which combines the immersive reality provided by VR technology with traditional games [4]. The combination of customs clearance elements has truly achieved the purpose of "education through fun."

Teaching quality is the key metric for improving teachers' teaching ability and teaching management level [5]. Through the evaluation of teaching quality, students can give feedback on the teaching situation of teachers. At the same time, teachers can reflect on teaching effects, schools can improve teaching management, and propose solutions and methods to improve teachers' teaching levels and teaching quality. Teaching improvement methods in the universities' courses include the fuzzy comprehensive evaluation method [6], analytic hierarchy process [7], grey relational analysis method [8], and neural network method [9]. These methods have achieved certain results, but there are random shortcomings of sex and subjectivity that make it impossible to accurately evaluate the quality of teaching. In order to improve the accuracy of college English teaching quality evaluation, an English teaching quality evaluation method based on the analytic hierarchy process and krill swarm algorithm to improve the nuclear extreme learning machine is proposed.

The research should begin by identifying the root causes of learning anxiety and help students master stress and anxiety management skills through psychological health education. Based on this, personalized learning paths should be developed, utilizing interactive learning environments and educational technologies such as online platforms and mobile applications to provide students with flexible learning times and methods. The design of blended courses should combine the advantages of online and offline teaching, providing a variety of learning materials and activities to increase the interest and interactivity of learning. At the same time, an effective assessment and feedback mechanism should be established to ensure that students can understand their learning progress in a timely manner and receive guidance from teachers. Teacher training is also crucial to improve their ability to identify and deal with students' psychological anxiety. The reform of course content should reduce reliance on rote memorization and emphasize the practical use of language and creative thinking. In addition, empirical research should be conducted to test the effectiveness of different teaching methods and resources in alleviating learning psychological anxiety, and teaching strategies should be continuously adjusted and optimized based on research results. A community support network between students, teachers, and parents should be established to jointly pay attention to and deal with the issue of learning psychological anxiety, and continuous tracking research should be conducted to evaluate the long-term effects of teaching reform in order to promote students' psychological health and learning effectiveness. In order to evaluate English teaching quality, AHP is used to construct an English teaching quality evaluation index system that includes five first-level evaluation indexes. The English teaching quality level is divided into three levels: under-standard, standard, and high-quality products, and it is used as the output of KH-KELM. Through the expert scoring method, 18 English teaching quality evaluation secondary index data are obtained and used as the input of KH-KELM. Establish a KH-KELM evaluation model of English teaching quality. Compared with KELM and support vector machines, KH-KELM can effectively improve the accuracy of English teaching quality evaluation and provide new methods and approaches for English teaching quality evaluation.

2 ENGLISH REMOTE MULTIMEDIA COURSE REFORM TEACHING SYSTEM BASED ON VR TECHNOLOGY

2.1 Hardware Design of VR English Multimedia Course Reform

The system hardware required by VR technology includes hardware devices such as 3D scanners, 3D stereo graphics cards, circular projection screens, position trackers, data gloves, and other hardware devices. The hardware structure of the system is shown in Figure 1.

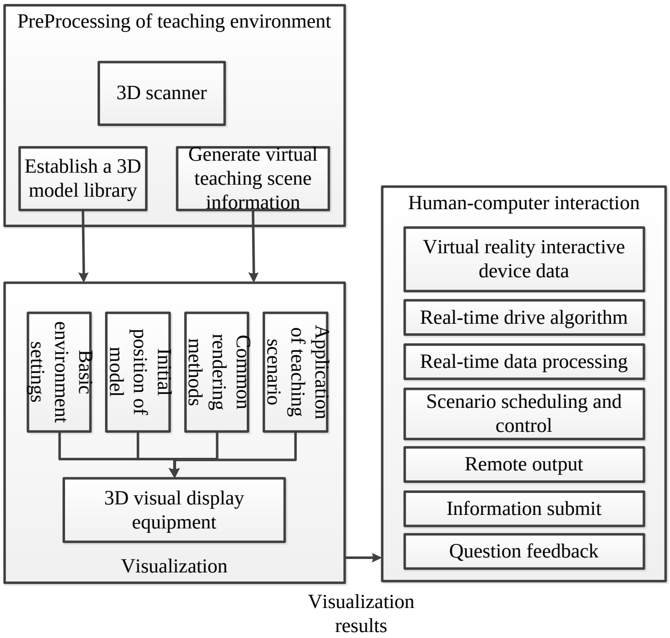


Figure 1: Framework structure of VR English multimedia course reform system.

If you want to apply VR technology to the education system, you must build a three-dimensional model of the teaching content and enhance students' sense of immersion through the virtual model. In the process of modeling in English teaching, the actual objects that need to be simulated are often of different shapes and rules [10]. Traditional hardware devices cannot simulate such models, so 3D scanners are added to the system to assist in modeling. The scanner scans the actual environment in a non-contact manner using a three-dimensional detection method to obtain three-dimensional point cloud data of the physical surface and generates a virtual digital model through a computer [11]. The new three-dimensional visual display device provides students with VR teaching three-dimensional scenes and realizes holographic vision with the refraction power of multiple emitted light rays.

The device isolates the user from the outside world, can put the students in a state of complete immersion, and is not easily disturbed by the external environment [12]. The VR interactive device is the most indispensable hardware in the designed teaching system, and it includes data gloves, moment balls, joysticks, tactile feedback devices, and force feedback devices. Connect data gloves or other operating equipment with the signal processing circuit and high-intensity interaction between the posture of the human hand or the operating state of the equipment and the data information in the virtual environment so that students can be immersed in the virtual teaching environment, feel foreign customs, and improve learning Autonomy and flexibility [13].

2.2 Design of VR English Multimedia Course Reform Software

Model-based technology and image-based rendering technology realize scene construction in 3dsMAX software. Upload the scanned entity data information to the computer, use the small plane to simulate the physical surface, create the basic geometry of the physical object, adjust the size of a single model according to the requirements, use the error adjustment function to adjust the size of a single model, and create a three-dimensional model through model assembly and splicing [14]. The error function for adjusting the model size is:

$$\delta = \frac{\Delta p}{s} = \frac{\lambda w_i - s}{s} \tag{1}$$

where δ represents the actual relative error, which is the ratio of the absolute error to the actual true value; Δp represents the absolute error, which not only indicates the magnitude of the data difference, but also the positive and negative direction of the difference; λ is a coefficient, which represents the virtual model component The ratio between represents the drawn, independent virtual model assembled by i individual sub-models [15].

According to the requirements of the English teaching system, the parameters of the established model are adjusted to obtain virtual models with different resolutions to meet the display requirements of the teaching system. Suppose the designed model has x_i pixels in the horizontal direction and y_i pixels in the vertical direction. At this time, the total pixels of the model [16] are to adjust the pixel resolution of the module, the calculation expression is:

$$\begin{cases} f_1 = l_1 \cos\theta \cdot t \cdot n \cdot z \\ f_2 = l_2 \cos\theta \cdot t \cdot n \cdot z \end{cases} \tag{2}$$

where f_1 is the model pixel in the positive direction; f_2 is the model pixel in the reverse direction; l_1 is the model length in the positive direction; l_2 is the model length in the reverse direction; θ represents the illumination angle; t is the illumination duration of each stage; n is the model in each direction, making up the number of surfaces. Based on the above equation, a three-dimensional virtual teaching scene, as shown in Figure 2, is constructed. Figure 2 is a virtual teaching environment built based on the actual scene of the Louvre. In this environment, a dialogue scene asking for directions is simulated. Students can achieve the purpose of oral English practice through dialogue with virtual characters in the environment [17]. Fix the rotation axis of the video showcase to keep the lens rotation angle between the specified values [18]. Use VRML language to simulate the device, set the three-dimensional coordinates of the motion of the hardware device to meet the transformation of the virtual scene in space, and part of the running code is as follows:

Figure 2: The virtual teaching environment of multimedia English course reform.

$DEF\ Cylinder01 - TIMER\ TimeSensor\ \{loop\ TRUE\ enabled\ FALSE\ cycleInterval\}$

$TimeSensor$

$DEF\ xiabie - POS - INTERP\ Position\ Interpolator$

$key\{0, 0.2, 0.22, 0.47, ..., 0.54, 0.57\}$

$keyValue\{36.54, 3.766 - 3.345, ..., 16.87, 3.766 - 35.45\}$

$DEF\ xiabie - ROT - INTERP\ Orientation\ Interpolator$

$key\{0, 0.2, 0.22, 0.47, ..., 0.54, 0.57\}$

$keyValue\{1000, 1000, ..., 0, -1, 0, -1.134\}$

According to the instruction program compiled by the above code, the dynamic demonstration rules in the teaching scene are set, and the dynamic teaching scene with a certain length of time is imported into VRML to realize the set interactive function [19]. From the data transmission and layout conversion of complex teaching procedures [14], The calculation expression of the response function is:

$$g(w) = mq - k_i \tag{3}$$

where $g(w)$ denotes the program's corresponding function, and m denotes the coefficient from the corresponding function. Moreover, the parameter denotes the response coefficients of the quality teaching. This function is used to trigger the operation program when students learn English so as to enter the virtual scene [20] quickly.

3 UNITY3D MULTIMEDIA ENGLISH TEACHING INTERACTIVE GAME CLASS REFORM QUIET EXPERIENCE

"In Order To Dr." is an educational puzzle-solving English game. After understanding the rules of the game, participants will reason according to clues and answer the corresponding questions with the use of props until they successfully complete the final question and pass the level. This game is a puzzle-solving game. Players find the place where the question is set according to the clues and answer the question correctly to get the clues for the next step. Participants understand the background and rules of the game through NPC commentary [21]. After completing the first English test, they can obtain the "Escape Book" containing grammar knowledge points, which can be viewed at any time during the game. Figure 3 shows the Unity3D English interactive game scene display.

Figure 3: Based on Unity3D English interactive game scene display.

This game chooses to run on the Android platform, with the help of the relevant VR technology integration provided by Storm Mirror, and is developed through the Unity3D platform to summarize the development process shown in Figure 3. The Mojing SDK development kit mainly obtains head tracking data from mobile phone gyroscopes, corrects static offset values, and provides convenient support for developers in terms of image anti-lens distortion, adaptation, and control of interactive peripherals.

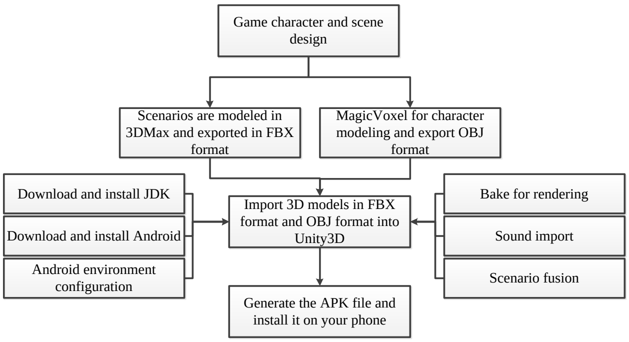


Figure 4: Mobile VR interactive game developments processed for English teaching curriculum reform.

3.1 VR Interactive Game Scene Architecture

In Unity3D-based multimedia English teaching curriculum reform interactive game design, there are a total of six main scene frameworks, namely:

(1) Scene model creation: According to this case's game background, conceive the game scene's style and characteristics, and use 3DsMax for modeling. 3Ds-Max provides the required modeling tools. Before formal modeling, the system unit should be set to the international standard millimeter. Create a two-dimensional plane and extrude it according to the room renderings, adjust the attributes, and make the model close to the ideal effect. In order to reduce the computer load and, at the same time, better display the model texture, shadow, and other details, the use of shadow-baking technology will require a large amount of light information to be calculated by generating

texture maps [22]. In order to make the scene more realistic, you need to use Photoshop to process the textures of each object in the scene.

(2) Character model creation: We chose the popular Voxel style for the character model style in this game. The creation of the character model uses the Magic Voxel modeling tool. Because of its simple operation, different character models can be easily created according to the different colors and stacking methods.

(3) Model export and import: select the export object in 3DsMax, select the FBX format to export, and save it in the Assets folder under the Unity3D project folder to view the effect. If the texture is lost, you can remap it in Unity3D. The character model in Magic Voxel is exported in OBJ format and copied directly to Unity3D.

(4) Scene lighting settings: Appropriate lighting can make the entire scene rich in layers, and the use of light and shadow changes can enhance the atmosphere and enhance the realism of the scene. The Shadow mask function of Unity3D2017 is used in the case game scene, which is roughly divided into three steps: setting the scene and setting the lighting parameters; modifying the light map parameters for soft shadows to avoid band shadow defects; selectively using other post-processing that can enhance the effect Special effects.

(5) Background music and sound effect settings: Playing music in Unity3D requires three basic components: Audio Listener, Audio Source, and Audio Clip. Add background music: In the scene, add an Audio Source component to the Camera, drag our music file onto the Audio Clip property, and check Loop to make it play in a loop. Add sound effects: Use a case test to find the music file we imported, set it to 3D music, and assign Audio Listener components and music files to the characters and game clues.

(6) Run the game, return to the Scene window, and drag the Audio Listener component to feel the effect of moving between the two speakers. Audio Source provides two methods for playing sound: The Play method is suitable for playing background music because only one background music is playing at the same time, and it also needs control such as play and pause; Play One Shot method is suitable for playing sound effects, because the sound effects are generally only played once No other control is needed, and multiple sound effects are allowed to play at the same time [23].

Design of functional modules for VR interactive games

In the multimedia English teaching curriculum reform interactive game design based on Unity3D, there are a total of four main functional modules, namely:

(1) Unity physics engine module design: After the game scene is established, the objects need to be given the corresponding physical properties so as to imitate the collision and other reactions of the objects in the real world. Unity3D has built-in NVIDIA's PhysX physics engine, which can efficiently and realistically simulate rigid body collisions, gravity, and other physical effects, making the game more vivid and realistic. Among them, the rigid body component can make the game object move under the control of the physical system, making the game object closer to the real-world movement. Select the game object that needs to be added, and then it will have physical properties. If two rigid bodies collide with each other, the physics engine will calculate the collision unless the two objects have a colliding body. In the physics simulation, the rigid bodies, without colliding bodies, will pass through each other [24].

(2) The design of the character controller: The character controller is mainly used to control the protagonist of the first-person or third-person game. To create a humanoid character in this game, you need to add a character controller. The role control module mainly controls the behavior of the protagonist, including the current state of the character, the control of the traveling speed, and the judgment of the action behavior. The way to add a custom character controller is: select the character

$\left[Controllable\ object\right] \rightarrow \left[Component\right] \rightarrow \left[Physics\right] \rightarrow \left[Character\ controller\right]$ and add a custom character controller component to the object. Finally, add the role controller preset in the imported Mojing SDK development kit. The Unity first-person role preset includes its own camera. After adding a first-person Character, you should delete the main camera automatically when creating the scene.

(3) The design of the camera controller: The normal game mode adopts the third-person perspective, and the third-person perspective lens must follow the protagonist and keep a certain height and distance to ensure that the player can always see the protagonist. The VR experience area imports the Mojing Main preset camera provided by Mojing SDK to replace the Main Camera, which is automatically added when the scene is created. In fact, the left and right cameras are bound together to divide the screen into two parts; the Integrate Input Manager is also added to obtain the key events of the handle; you can switch the buttons up, down, left, and right, press the OK button to select the trigger button; Overlay preset component realizes the Gaze Pointer ray crosshair in the center of the scene, used to focus the UI button, after focusing on the button, click the OK button to trigger the button click event [25].

(4) Grid addressing mode: In this game, players need to browse the game scene, which needs to add a path-finding function. Unity3D provides an applicable grid path-finding function, namely NAVMesh. NavMesh is a technology used to realize dynamic automatic path finding in Unity3D. It can distinguish paths and obstacles by baking terrain data and navigation data. Then, give the path-finding components of the character who needs to find the way, and set the parameter settings related to the speed and the destination. When the destination is set, the character can proceed to the destination by itself according to the baked terrain. On this basis, it can is beneficial to add components such as role controllers.

4 THE INTELLIGENT EVALUATION MODEL OF MULTIMEDIA ENGLISH TEACHING CURRICULUM REFORM COMBINING AHP AND KH-KELM

4.1 The Evaluation Index System of English Teaching Quality

The analytic hierarchy process (AHP) [26] is mainly used to deal with more complicated and vague problems, which contain the following key steps:

(1) The AHP hierarchical model is constructed and mainly includes a target layer, criterion layer, and element layer.

(2) Construct a judgment matrix; use the pair-wise comparison method to sort the relative pros and cons of each evaluation index and establish a judgment matrix. For n evaluation indicators, the judgment matrix is as shown in equation (4),

$$A = (a_{ij})_{n\times n} \tag{4}$$

(3) The weight w_i of each evaluation index from the hierarchical process is computed;

(4) Consistency inspection. Consistency test judgment index, as equation (5),

$$CR = \frac{\lambda_{\max} - n_A}{n_A - 1} \tag{5}$$

Where $\lambda_{\max}$ is the maximum eigenvalue of the judgment matrix A ; n_A is the order of the judgment matrix A . A scientific and reasonable evaluation index is an important guarantee for improving teaching quality and teaching level. On the basis of reference [27], a set of English teaching quality evaluation index systems based on five different corresponding things are constructed, as shown in Figure 5.

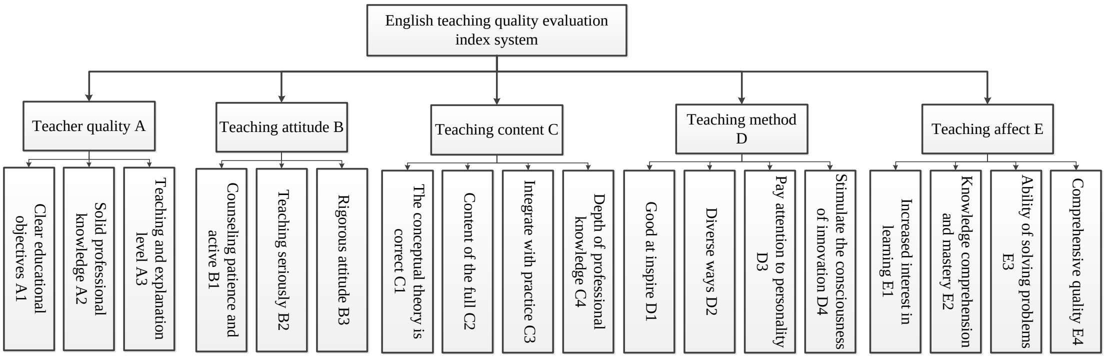


Figure 5: The evaluation index system of English teaching quality.

4.2 Kernel Extreme Learning Machine

Assuming there are N training samples (X_i, Y_i), the input and target vectors are respectively $X_i = [x_{i1}, x_{i2}, \ldots, x_{in}]^T \in R^n$ and $T_i = [t_{i1}, t_{i2}, \ldots, t_{in}]^T \in R^m$. X and T are $n \times Q$ -dimensional and $m \times Q$ -dimensional matrices, respectively. Therefore, the output of the ELM model [28] with the number of hidden layer nodes L is as shown in equation (6),

$$\sum_{i=1}^{L} \beta_i g(W_i \cdot X_j + b_i) = o_j, j = 1, 2, \ldots, N \tag{6}$$

where β_i is the output weight of the ELM model; $g(x)$ is the excitation function of the ELM model; $W_i = \left[w_{i1}, w_{i2}, \ldots, w_{in}\right]^T$ is the input weight of the ELM model; $W_i \cdot X_j$ is the inner weight of W_i and X_j product; b_i is the bias of the i -th hidden layer node of the ELM model.

The goal of ELM learning is to minimize the output error of the model, as in equation (7),

$$\sum_{j=1}^{N} \left\| o_j - t_j \right\| = 0, j = 1, 2, \ldots, N \tag{7}$$

Combine equation (6) and equation (7), that is, β_i , W_i and bi exist, as in equation (8),

$$\sum_{i=1}^{L} \beta_i g(W_i \cdot X_j + b_i) = t_j, j = 1, 2, \ldots, N \tag{8}$$

The matrix form of equation (8) is transformed as equation (9),

$$H\beta = T \tag{9}$$

where is the output of the hidden layer node of the ELM model; β is the output weight matrix of the ELM model.

$$\begin{bmatrix} g(W_1 \cdot X_1 + b_1) & ... & g(W_L \cdot X_1 + b_L) \\ ... & ... & ... \\ g(W_1 \cdot X_N + b_1) & ... & g(W_L \cdot X_N + b_L) \end{bmatrix}_{N\times L}, \beta = \begin{bmatrix} \beta_1^T \\ ... \\ \beta_L^T \end{bmatrix}_{L\times m}, T = \begin{bmatrix} T_1^T \\ ... \\ T_L^T \end{bmatrix}_{L\times m} \tag{10}$$

For the convergence of the usage of the ELM model, there is a set of parameters $\hat{\beta}_i$, $\hat{W}_i$ and $\hat{b}_i$, as shown in [29] equation (11),

$$\left\| H(\hat{W}_i, \hat{b}_i)\hat{\beta}_i - T \right\| = \min_{W,b,\beta} \left\| H(W_i, b_i)\beta_i - T \right\| = \sum_{j=1}^{N} \left(\sum_{i=1}^{L} \beta_i g(W_i \cdot X_j + b_i) - t_j \right)^2 \tag{11}$$

To improve the generalization ability and stability of the ELM model, the regularization coefficient C is introduced into the standard ELM model, as shown in equation (12),

$$\hat{B} = H^T \left(HH^T + \frac{1}{C} I \right)^{-1} T \tag{12}$$

Then, the output of the ELM model is as in equation (13),

$$y(x) = h(x)\hat{B} \tag{13}$$

In order to avoid the influence of the initial weight and bias selection of the ELM model, the kernel extreme learning machine (KELM) is established by extending the architecture of the conventional ELM model, in which the kernel matrix $Q_{ELM} = HH^T$ is as in equation (14),

$$Q_{ELM} \ \ i,j \ = h(x_i) \cdot h(x_j) = K \ \ x_i, x_j \tag{14}$$

Where the kernel function $K \ \ x_i, x_j$ in this paper is the RBF kernel function. Substituting equation (14) into equation (13), the output of KELM is as equation (15),

$$y(x) = \begin{bmatrix} K(x, x_1) \\ ... \\ K(x, x_N) \end{bmatrix}^T \left(\frac{1}{C} I + Q_{ELM} \right)^{-1} T \tag{15}$$

4.3 **English Teaching Quality Evaluation Combining AHP and KH-ELM**

In the krill swarm (KH) algorithm, each individual krill is a feasible solution in the solution space, and food is the global optimal solution of the KH algorithm. The total movement of krill Z_k is determined by induced movement R_k, foraging movement S_k, and random diffusion T_k [30]. The subscript k represents the k-th value as in equation (16),

$$Z_k = R_k + S_k + T_k \tag{16}$$

Where Z_k is the total movement of krill.

(1) Induction exercise

Induced movement is divided into target guidance, local influence, and guidance inertia, as in equation (17),

$$R_k = R^{\max}\alpha_k + w_r R_k^{old} \tag{17}$$

Where $R^{\max}$ is the maximum induced velocity; R_k^{old} is the velocity vector of the last induced motion; α_k and w_r are divided into induced direction and induced weight; α_k and w_r are both between $[0,1]$, and $\alpha_k + w_r = 1$.

(2) Foraging campaign

Foraging activities include foraging experience and food guidelines. Foraging speed S_k is as follows (18),

$$S_k = V_s \beta_k + w_s R_k^{old} \tag{18}$$

Where V_s is the maximum foraging speed; β_k and w_s are the foraging direction and weight, respectively; β_k and w_s are both between $[0,1]$, and $\beta_k + w_s = 1$.

(3) Random diffusion

The random diffusion velocity T_k is as in equation (19),

$$T_k = T^{\max}(1 - t / t_{\max})\delta \tag{19}$$

Where δ is the random diffusion direction, and $\delta \in [0,1]$; $T^{\max}$ is the maximum random diffusion speed. The update equations for individual krill positions in the Δt time period are as follows equations (20) and (21),

$$x_k(t + \Delta t) = x_k(t) + \Delta t \times Z_k \tag{20}$$

$$\Delta t = C_t \sum_{i=1}^{NV} (UB_i - LB_i) \tag{21}$$

Where C_t is the step size scaling factor; UB_i and LB_i are the upper and lower bounds of the variable; NV is the dimension of the variable. Aiming at the effects of the regularization coefficient C and the kernel function parameter g of the KELM model, the KH algorithm is used to optimize the regularization coefficient C and the kernel function parameter g of the KELM model. In order to minimize the evaluation of English teaching quality, the fitness function is selected [31], such as equation (22),

$$\min f(C,g)=\sqrt{\frac{1}{n}\sum_{i=1}^{n}(x(i)-\hat{x}(i))^2} \\ s.t.\ C\in\left[C_{\min},C_{\max}\right],g\in\left[g_{\min},g_{\max}\right] \tag{22}$$

Where $x(i)$ and $\hat{x}(i)$ are the actual scores of English teaching quality and the predicted scores of English teaching quality of the i -th sample, respectively; n is the number of training sample sets; $\left[C_{\min},C_{\max}\right]$ and $\left[g_{\min},g_{\max}\right]$ are the value range of penalty parameter C and kernel function parameter g respectively.

The algorithm flow of English teaching quality evaluation based on AHP and KH-KELM is as follows.

Step 1: Establish a hierarchical analysis model for the evaluation of English teaching quality;

Step 2: Construct a judgment matrix B : Use the 1-9 scale method to compare the evaluation indicators of English teaching quality pairwise to construct a judgment matrix B of the English teaching quality evaluation; if the evaluation index set of the English teaching quality evaluation model $A=\{a_1,a_2,...,a_n\}$, where n is the number of evaluation indexes, and a_i is the i -th evaluation index that needs to be compared, as in equation (23),

$$B=\begin{bmatrix} r_{11} & r_{11} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nn} \end{bmatrix},\begin{cases} r_{ij}=1,i=j \\ r_{ij}=1/r_{ij},i\neq j \end{cases} \tag{23}$$

The weights of each evaluation index $a_1,a_2,...,a_n$ are respectively $w_1,w_2,...,w_n$, r_{ij} are the membership degrees of index a_i more important than index a_j ;

Step 3: Calculate the weight: use equation (24) to calculate the weight and equation (25) to normalize the weight. The weight calculation equation is as equation (24),

$$w_i=\sqrt[n]{\prod_{j=1}^{n}a_{ij}} \tag{24}$$

The weight normalization equation is as equation (25),

$$w_i=\frac{w_i}{\sum_{i=1}^{n}w_i} \tag{25}$$

Step 4: Consistency test: Carry out the consistency test according to equation (5), if $CR<0.1$, pass the consistency test; otherwise, adjust the judgment matrix;

Step 5: The scoring matrix is divided into a training set and a test set. The training set is used to establish the KH-KELM English teaching quality evaluation model, and the test set is used to verify the correctness of the KH-KELM English teaching quality evaluation model;

Step 6: Set the parameters of the IKH algorithm: krill population size N , maximum random diffusion speed $T^{\max}$, maximum induction speed $R^{\max}$, maximum number of iterations $Maxgen$, and maximum foraging speed V_s , and initialize the population randomly;

Step 7: For the training set, calculate the fitness of the population according to equation (22), and sort, and calculate each movement component;

Step 8: Update the position of krill population;

Step 9: Determine the termination condition of the algorithm. If the maximum number of iterations $Maxgen$ is reached, the optimal solution is output, that is, the best regularization coefficient C^* and kernel function parameter g^* are obtained. Otherwise, return to Step7; Step 10: Substitute the best regularization coefficient C* and the kernel function parameter g^* into the KELM model to evaluate the English teaching quality.

5 SIMULATION EXPERIMENT AND RESULT ANALYSIS

5.1 Experimental Results of Multimedia English Teaching Curriculum Reform Based on VR

To test the performance of the system, compare the traditional teaching system with the designed system to find out the functional differences between the two.

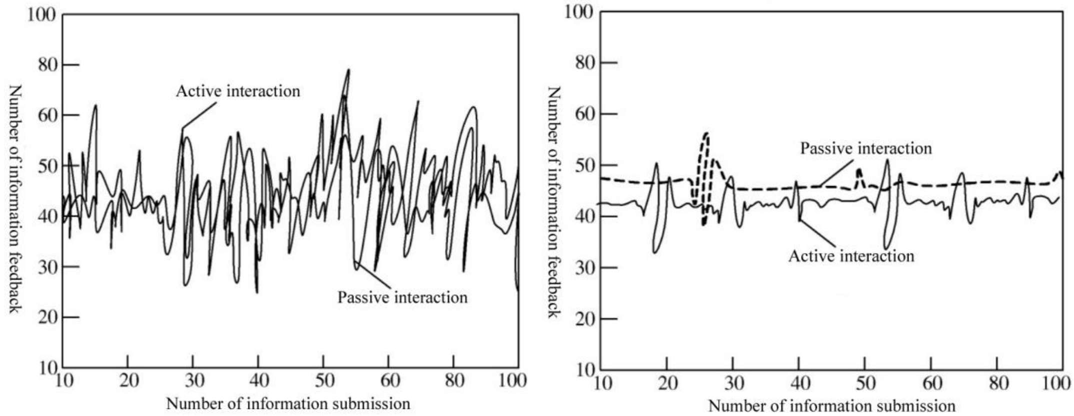
5.1.1 Experiment preparation

Transfer the designed system and the traditional system to two computers with the same configuration. The experiment uses two 1024MB memory to form a dual communication channel, a dual-core CPU at 2.65GHz, a GF9800GT graphics card supporting 3D models, and a 64-bit operating system, Windows XP pre-installed. Load the VRML browser into the computer with the VR technology teaching system. Moreover, the Cycore ActiveX is used as the plug-in in the experiments to ensure the normal usage of the Cult3D contents. Two English teaching courses are running in the environment to confirm that both VR experiments operate normally. Otherwise, all experimental settings are followed with the corresponding requirements of the established VR environment.

5.1.2 VR-based mixture course reform experimental results

Mark the test result under the designed teaching system as A, and mark the test result under the traditional teaching system as B. Randomly select 100 students and use the two kinds of teaching systems to learn respectively to obtain the system interaction shown in Figure 6. From the sexual comparative test results of group A in Figure 6, it can be seen that the number of information submissions and the number of information feedbacks are roughly the same for the designed teaching system, and the degree of active interaction and passive interaction curve fluctuates sharply, indicating that the system interacts frequently, and the operation of the system is students, real-time active feedback of teaching information when the user asks questions, promptly explain the problems; and from the test results of group B.

It can be seen that the active interaction curve and passive interaction of the system under the same information data submission premise do not appear to fluctuate sharply, indicating that the system's interaction is not high, the ability to actively feedback teaching information is poor, and the feedback is not positive for users' questions. From the comparative experimental results, we have suggested the conventional English teaching system has poor interaction, which affects students' interest in learning.



(a) Testing results of group A (b) Testing results of group B

Figure 6: Interaction comparison results of the two systems.

5.2 Experimental Results of the Quality Evaluation of English Teaching Curriculum Reform Based on Artificial Intelligence Technology

5.2.1 Data sources

According to the AHP English teaching quality evaluation hierarchical model, the expert scoring method to obtain the data of the English teaching quality evaluation of Provincial University from 2008 to 2017, the maximum and minimum methods to normalize the data, and the normalized results are shown in Table 1.

Year	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
A1	0.024	0.036	0.047	0.059	0.062	0.063	0.093	0.104	0.136	0.147
A2	0.113	0.128	0.143	0.167	0.146	0.135	0.175	0.165	0.217	0.219
A3	0.162	0.176	0.176	0.182	0.187	0.192	0.196	0.229	0.253	0.284
B1	0.174	0.183	0.184	0.184	0.176	0.176	0.167	0.205	0.219	0.231
B2	0.165	0.176	0.163	0.187	0.193	0.192	0.184	0.227	0.257	0.246
B3	0.166	0.187	0.192	0.193	0.207	0.208	0.241	0.251	0.265	0.267
C1	0.217	0.237	0.214	0.185	0.165	0.158	0.156	0.159	0.279	0.283
C2	0.043	0.047	0.051	0.073	0.107	0.107	0.137	0.168	0.181	0.185
C3	0.034	0.035	0.043	0.056	0.081	0.108	0.135	0.154	0.176	0.213
C4	0.108	0.112	0.114	0.114	0.119	0.117	0.116	0.113	0.115	0.114

D1	0.059	0.053	0.071	0.069	0.083	0.093	0.105	0.106	0.119	0.115
D2	0.032	0.052	0.063	0.072	0.063	0.076	0.095	0.093	0.087	0.106
D3	0.064	0.076	0.137	0.056	0.062	0.059	0.059	0.081	0.116	0.144
D4	0.127	0.134	0.017	0.106	0.047	0.047	0.063	0.076	0.087	0.117
E1	0.009	0.015	0.013	0.026	0.039	0.036	0.054	0.068	0.083	0.116
E2	0.134	0.019	0.012	0.018	0.021	0.026	0.037	0.081	0.103	0.098
E3	0.146	0.076	0.079	0.059	0.042	0.036	0.075	0.094	0.116	0.091
E4	0.651	0.072	0.076	0.081	0.089	0.952	0.113	0.116	0.139	0.157

Table 1: English Teaching Quality Evaluation Index scores.

The scoring experts were randomly selected by members of the English Teaching Experts Database of the Scientific Research Project of the Provincial Department of Education in 2019. There are 10 experts in total. The expert titles are at the sub-high level or above, have a strong academic level, and are very familiar with the professional content. Ten experts scored 18 secondary indicators. In order to avoid the influence of personal subjective factors, the average of the scores of 10 experts was finally used as the final scoring result, as shown in Table 2.

Scoring year	*2008*	*2009*	*2010*	*2011*	*2012*
P	0.4874	0.5125	0.5214	0.5277	0.5387
Scoring year	2013	2014	2015	2016	2017
P	0.6175	0.6873	0.8054	0.8913	0.9784

Table 2: Final scores of English teaching quality evaluation.

In order to measure the evaluation effect of English teaching quality, the evaluation index chooses root mean square error (RMSE) and mean absolute error (MAE) [32], such as equations (26) and (27),

$$RMSE = \sqrt{\frac{1}{n}\sum_{k=1}^{n}(x_k - y_k)^2} \tag{26}$$

$$MAE = \frac{1}{n}\sum_{k=1}^{n}\left|(x_k - y_k)\right| \tag{27}$$

Where n is the number of samples; x_k and y_k are the actual scores of English teaching quality evaluation and the predicted scores of English teaching quality evaluation of the k-th sample.

5.2.2 AI-based mixture course Reform experimental results

According to the requirements of English teaching quality and on the basis of relevant research literature, the quality of English teaching is divided into three levels: under-standardized, standardized, and high-quality courses. The classification standards are shown in Table 3.

Comprehensive index	$0.8 < P \leq 1$	$1 < P \leq 1.2$	$P > 1.2$
Evaluate criterion	Lack of standardization	Standardization	Boutique

Table 3: Standards for the evaluation of English teaching quality.

A total of 10 sets of data from 2008 to 2017 were obtained through expert scoring. The first 6 sets of data were used as the training set, and the last 4 sets of data were used as the test set. In order to verify the effectiveness and reliability of KH-KELM's English teaching quality evaluation, KH-KELM was compared with KELM and support vector machine (SVM). The comparison results are shown in Figure 7 and Table 4.

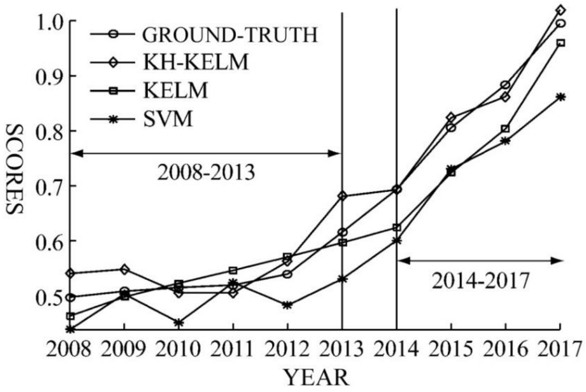


Figure 7: Comparison results of English teaching quality evaluation.

Comparative algorithms	RMSE	MAE
KH-KELM	0.3274	0.1957
KELM	0.3965	0.2545
SVM	0.8145	0.6354

Table 4: Comparison results of English teaching quality assessment.

From Figure 7 and Table 4, the English teaching quality evaluation results show that compared with KELM and SVM, KH-KELM's English teaching quality evaluation results have the smallest RMSE and MAE, which are 0.3274 and 0.1957, respectively, indicating that KH-KELM It can effectively improve the accuracy of English teaching quality evaluation, and provide new methods and approaches for English teaching quality evaluation.

6 CONCLUSIONS

VR English educational games can create scenes that are as close to the real environment as possible and experience a fully immersive virtual environment through head-mounted devices so that players are less affected by external interference. The game plot guides the required learning goals, enabling students to accumulate knowledge in the process of active exploration. For learners, this type of game is interesting and highly autonomous, and it is easier to arouse learners' enthusiasm. The teaching system, after adding VR technology as a brand-new teaching mode, will greatly help students improve their English knowledge. The system not only solves the cumbersome problem of finding teaching materials when preparing lessons but also improves the ability to track and control the teaching environment and teaching links. Students can solve learning questions through timely questioning and real-time information feedback and improve their ability to master English knowledge. In order to realize the evaluation of English teaching quality, AHP is used to construct an English teaching quality evaluation index system including 5 first-level evaluation indexes. The English teaching quality level is divided into three levels: under-standard, standard, and high-quality products, and it is used as the output of KH-KELM. Through the expert scoring method, 18 secondary index data of English teaching quality evaluation are obtained and used as the input of KH-KELM. To establish the KH-KELM English teaching quality evaluation model. Compared with KELM and SVM, KH-KELM can effectively improve the accuracy of English teaching quality evaluation and provide new methods and approaches for English teaching quality evaluation.

It is of great significance to study the healthy treatment of learning anxiety in the reform of the English teaching resource system and mixed curriculum. Not only does it enhance the overall well-being of students and promote mental health by reducing learning stress and anxiety, but it also improves learning efficiency and memory, helping students to absorb knowledge more effectively. Personalized learning paths are developed to meet the specific needs of different students, making education more personalized and adaptable. In addition, innovations in hybrid curriculum design have driven the development of educational practices, enhanced student engagement and motivation, and made the learning experience more positive. Empirical research provides the basis for teachers to improve their teaching methods and teaching quality continuously. At the same time, this teaching mode encourages students to develop the ability to learn independently, laying the foundation for lifelong learning. The integration of disciplines provides new perspectives for educational research, helping students to enhance their social adaptability and ability to cope with life changes. Educational equity is achieved because all students have access to a quality education without undue anxiety. Continuous follow-up research and the establishment of community support networks ensure that the education system is able to continuously self-evaluate and improve, adapt to changes in the educational environment and social needs, and jointly promote the academic success and mental health of students.

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