Online and Offline Audio-visual-oral English Teaching Model Construction Based on ARCS

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Abstract

Guided by the ARCS motivation model, this paper applies the theory of motivation strategy design to the blended teaching model of college English listening and speaking courses. From the perspectives of teaching resource selection, teaching goal setting, teaching task decomposition, teaching organization model and evaluation method construction, this paper analyzes how to improve the online and offline teaching design to improve the teaching effect of listening and speaking courses.

Keywords: ARCS model; Online and offline teaching; Motivational strategy design

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1 Introduction

Online education, as the trend, is particularly important. Before that, there were abundant research results on online teaching, but most of them were used as auxiliary means of traditional classroom teaching, such as the teaching mode combining online and offline (Figure 1): or the research on students' spontaneous learning behavior. There were few cases where online teaching independently supported all teaching activities. Therefore, online teaching is on the track of standardization and high quality, which has become an urgent problem for teachers to think about, and the analysis of the characteristics of online learners is an indispensable part. Compared with offline classroom learners, online learners are separated from teachers in time and space[1]. They receive course content through various technological media and maintain contact with teachers, which is weak in connection with other learners. They are mainly learning as individuals, and their learning mode generally presents a state of radiation-independent development, accompanied by a sense of loneliness in learning, loss of educator's role model and peer motivation, loose learning atmosphere and lack of teaching supervision[2]. As a result, complete online learners have low learning motivation, low class participation, weak learning autonomy and initiative, and also reveal the lack of learners' ability to plan and adjust themselves in online learning[3].

![Figure 1. Combining online and offline teaching model](image)

2 On ARCS motive model

ARCS motivation model is a teaching design model with learning motivation as the core and starting point, which mainly includes four aspects: motivation analysis, motivation strategy design, implementation strategy and evaluation of consequences, among which motivation strategy design is the core of the model's teaching design. This model believes that learners' learning motivation is stimulated by four factors: Attention, Relevance, Confidence and Satisfaction, and none of them can be repeated[4]. Guided by ARCS model, teaching design should consciously attract students' attention to teaching content at various stages (A): help students establish the correlation between learning content and their own needs (R): cultivate and stimulate students' learning confidence (C): and help students gain satisfaction through efforts to achieve personal goals (S).
2.1 Dimensions of attention

The attention dimension requires teachers to attract students' interest and stimulate their curiosity, including three modes: sensory stimulation, exploration stimulation and change. A complete teaching process should start from students' learning motivation and anxiety at the beginning of the design, and set teaching objectives from the perspective of students, organize teaching content and arrange teaching activities. Teachers should pay attention to and maintain students' attention from beginning to end, and create instructional design that can truly stimulate students' internal learning motivation, so as to improve the teaching effect.

2.2 Relevance dimension

Relevance refers to how teachers meet students' individual learning needs and development goals, creating a positive attitude towards learning. There are three modes: goal orientation, motivation, coordination and familiarity. In order to achieve a high degree of compatibility between instructional design and the development goals of students' learning needs, the determination of training goals and the selection of teaching content should reflect the relevance of pragmatism, that is, to strengthen the correlation between the cultivation goals of college English teaching content and the cultivation of learners' professional learning or professional quality, and to enhance the driving force of students' learning from the perspective of practicality and benefit[5].

2.3 Dimension of confidence

Confidence can be interpreted as the positive learning psychological process of establishing self-confidence, achieving tasks and enhancing self-confidence, including three aspects of learning requirements for success opportunities and self-control. This requires teachers to conduct a detailed investigation and analysis of the English level, learning habits, knowledge reserve and learning objectives of the teaching objects before the teaching design. In this way, the overall design and implementation of teaching can be tailored to suit students, so that students can carry forward with appropriate load in the state of constant satisfaction and challenges, and the learning process can be built into a kind of step-by-step clearance type and a pleasant process of constantly realizing self-satisfaction[6].

2.4 Satisfaction dimension

Satisfaction refers to the intrinsic and extrinsic encouragement and reward learners get for achieving good results. It is complemented by the confidence dimension, and its branches include natural outcome positive outcome and justice. Students can obtain a sense of achievement and satisfaction by successfully using the new knowledge to solve problems, and further stimulate the motivation of learning[7]. Teachers should add praise, reward or display in the design of teaching links, so as to enhance students' self-cognitive evaluation with the encouragement of external factors and the affirmation of others, and play a positive role in maintaining students' follow-up motivation. In a word, the ARCS model not only pays attention to the stimulation of motivation, but also pays more attention to the maintenance of motivation, emphasizing the promoting role of external design on the generation and maintenance of internal motivation. With the help of this model, teachers can re-optimize the online and offline teaching mode, and take stimulating students' learning motivation as the guiding principle of the whole teaching design from the perspective of students[8].
3 Online and offline audio-visual oral English teaching based on ARCS

3.1 Basis for the construction of teaching design model of ARCS motivation theory

ARCS motivation model reveals the core components of human motivation. Therefore, the construction of junior high school chemistry teaching design model based on ARCS motivation model theory should focus on how to integrate learning motivation into chemistry teaching design, how to integrate the core elements of ARCS motivation model theory into each link of specific classroom teaching design, so as to stimulate and maintain learning motivation and promote effective teaching[9]. Keller integrated learning motivation into classroom teaching design and proposed a motivational strategy design model, as shown in Figure 2. The motivational strategy design pattern has the following characteristics:1. The pattern is linear and lists 10 specific steps, indicating that the design process needs to take place in sequence;2. The pattern explicitly proposes to develop a motivational strategy for choice and design;3. This model emphasizes the combination of selected motivational strategies and teaching activities[10].

Kemp model is one of the classical models of instructional design. It is an elliptical structure model, as shown in Figure 3. Kemp model has the following characteristics:1. Kemp lists 10 factors, rather than steps, arranged in a clockwise logic that is not connected, showing the overall integrity and relative independence of the pattern;2. Placing modification and evaluation on the periphery of the ellipse indicates that modification and evaluation run through the whole instructional design process;3. The learning needs at the center of the ellipse provide reference and guidance for the whole instructional design;4. Teaching designers can flexibly choose the starting point of teaching and arrange the order of factors according to the actual situation and needs[11].
To sum up, based on the review of ARCS motivation model and related motivation theory teaching design literature, and according to the ARCS motivation model theory based teaching design principles of junior high school chemistry, try to build a teaching design model with ARCS four elements as the center and six factors, as shown in Figure 4[12].

The main features of teaching design based on ARCS motivation model theory embodied by this model are:
1) ARCS four elements are located in the center of the model, and the emphasis is placed on the various factors of instructional design based on ARCS motivation theory. It also shows that the teaching design always pays attention to the stimulation and maintenance of learning motivation to realize the stimulation and maintenance of learning motivation throughout the whole teaching process[13].

2) The model lists six factors, including a harmonious learning atmosphere, personal content and experience, attention-grabbing learning strategies, interactive learning styles, development of confident learning support mechanisms that affirm learners' efforts and achievements. The following six factors are listed in part of the implementation elements, the specific implementation elements will be detailed in the form of a table in the future. For example, teaching content should be in line with students' current cognitive development and future development, so as to bring students a personal experience[14].

3) This model draws on the structural framework of Kemp model, placing all factors inside the ellipse and evaluation and continuous improvement on the periphery of the ellipse, highlighting that evaluation and continuous improvement run through the whole instructional design process. In addition, teaching evaluation based on ARCS motivation theory can be divided into motivation level evaluation and achievement level evaluation. The arrow of motivation level evaluation points to the inner ellipse, indicating that motivation level evaluation is also used to guide the design of the six factors. The arrow of the inner ellipse points to the achievement level assessment, indicating that all the factors in the inner ellipse are also used to guide the design of the achievement level assessment.

3.2 Comparison and analysis of subjective level based on BP neural network

3.2.1 Basic principle of BP neural network

According to the preset weight value and threshold value, the signal propagates through layer by layer transmission in the hidden layer to generate the predicted output value and obtain the error between the output value and the expected value. Then, the error is backpropagated back to the nodes at each level step by step, and the weight and threshold are adjusted for the purpose of getting smaller error, which is the backpropagation of error. Set the number of iterations, repeat the training within this number, select the weight value and threshold value corresponding to the minimum error generated during the training, and the training is declared to be over[15].

3.2.2 Data collection

Collect initial sample data, and determine the number of input layer and output layer nodes and the expected value.

3.2.3 Parameter Setting

The empirical formula (1) is used to calculate the number of nodes in the hidden layer, which is expressed as:

\[ l = \sqrt{m + n + a} \]  

(1)
Where, \( m \) is the number of nodes in the input layer, \( n \) is the number of nodes in the output layer, and \( a \) is the adjustment constant between 1 and 10. Select the activation function used by the newff function in MATLAB by default, which is tansig (double S) type. The learning rate, the number of samples of training set and test set are determined through repeated attempts.

### 3.2.4 BP Algorithm Implementation

The MATLAB software is used to conduct simulation experiments, and the steps are as follows:

1) Use formula (2) to normalize the data.
   \[
   x'_{ij} = \frac{x_{ij} - x_{\text{min}}}{x_{\text{max}} - x_{\text{min}}}
   \]  
   \( (2) \)

2) Create a forward neural network and train the neural network.

3) Output the final forecast results.

### 4 Application of ARCS model in online and offline teaching design of listening and speaking courses

#### 4.1 Application of ARCS model in teaching resource integration and teaching task setting

The theme of this unit is Working Life, and the spoken output task of this unit is the survey and presentation of college students' popular occupation and personal career planning. According to the correlation dimension of ARCS model, all audio-visual reading resources have been selected and sorted out and related to the unit theme, so as to help students achieve task satisfaction and lay knowledge foundation. The task is set as a topic that students are familiar with and discuss highly in daily learning, which is in line with their future career requirements. In the implementation process of the teaching design, students always maintain clear learning motivation and consciously collect vocabulary and expressions related to the target task from various materials in each learning stage, so as to complete the thought expansion. In addition, the teaching design contains diversified audio-visual materials with rich content and pictures, including audio-visual dialogues, micro-video explanations, PPT text interpretation. These materials can help students obtain useful information from multiple dimensions of watching, listening and reading. Students can think deeply and integrate the newly acquired information with the existing knowledge[16].

#### 4.2 Application of ARCS model in teaching task decomposition

According to the ARCS model, the setting of unit tasks should meet students' learning needs and development goals, and the tasks should be practical and practical with moderate difficulty. The task of this unit is to investigate and demonstrate popular careers and personal career planning for college students. Students can clearly understand the employment environment and difficulty and plan their personal career development path by completing the task. From the perspective of inquiry motivation, in order to assist students to complete the task of this unit, teachers must guide students to complete the three sub-tasks decomposed from the main task in the process of implementing the strategy. In other words, oral conversation, group discussion and personal presentation, students will accumulate relevant vocabulary expressions and ideas for completing the main task of the unit after completing the three sub-tasks. Each sub-task has clear requirements and has interrelated learning resources.
When students complete the listening and reading input, they can realize the speaking output task. This decomposition method divides the difficulty of tasks step by step, so that students can timely draw nutrition resources when they reach each step in the process of climbing the ladder (referring to the guidance of peer teachers after each sub-task). If students complete the task well, they can get encouragement and praise from others, which will help students to improve their self-confidence and satisfaction; If students encounter obstacles and problems in practice, they can also be corrected in time. In such teaching process, students are always in a pleasant state of learning, which in turn helps to maintain learners' attention to learning[17].

4.3 Application of ARCS model in teaching organization

The development and implementation of online teaching is more dependent on autonomous learning mode. In order to better improve students' autonomous learning ability, teachers should take appropriate and effective measures in addition to educational guidance according to ARCS model. First of all, learning tasks can be achieved through individual work, partner work or group work and other forms, the choice of forms depends on the specific task requirements. The influence and driving effect of groups can not be underestimated in improving individual confidence and optimizing after-class learning environment. In the implementation of teaching tasks, teachers should help students give full play to the role of mutual learning. Teachers can assist students to find partners, select group leaders and create a communication atmosphere. Secondly, in classroom teaching, teachers can set an example by showing excellent examples of students to share typical problems, guide learners to find their own shining points or shortcomings, and encourage students to form a benign learning atmosphere of mutual supervision and reference.

4.4 Application of ARCS model in teaching evaluation

From one point of view, the advantages and disadvantages of online and offline teaching are identified. The average score of each indicator is shown in figure 5. It can be seen from the figure that the online mode of teaching has a clear effect on improving the students' ability to learn and listen well, and offline teaching mode has a positive impact on the development of students' ability and assessment ability. There is no difference between the two types in improving student learning behavior and overall teaching, but the combination of offline teaching is slightly better than online teaching[18].

![Figure 5. Mean score of subjective evaluation indicators](image-url)
Based on ARCS model, evaluation system of online and offline teaching models not only should make all-round and objective assess of the learning outcome of students, moreover, it is necessary to motivate learners through timely, effective, fair and reasonable evaluation mechanism in the whole process of teaching implementation. Thus, formative evaluation is very important for online and offline teaching. Formative evaluation should reflect the requirements of course content and teaching tasks. Taking listening and speaking courses as an example, formative evaluation criteria should include online resource viewing duration, online exercises, homework completion quality, online submission of speaking results, online community interaction popularity, etc. With the aid of information cloud data, teachers can dynamically grasp students' completion of various tasks and problems, and improve the fairness, timeliness and effectiveness of evaluation. Teachers will be instructed to make accurate reaction to their teaching plan in the next class. In addition, offline teaching testing methods (such as classroom questioning and testing results display or report) are useful supplements to online evaluation, and the feedback results and problems have practical reference significance for the design and implementation of the next round of motivation strategies[19-21].

5 Conclusion

The construction of college English online and offline teaching mode makes full use of the convenience of modern teaching means, but whether it can achieve the expected teaching effect when the hardware facilities are ready depends entirely on the soft environment construction of students' learning motivation. The motivation design model proposed by ARCS model can better guide teachers to truly start from the perspective of students and focus on what to learn and how to learn in blended teaching design and implementation. Students can thus be aided to build the scaffolding of learning, so that teaching content, objectives, tasks, teaching activities and evaluation forms, into a complete circle. A complete cycle is formed, which runs smoothly around the promotion of learners' learning motivation and the acquisition of satisfaction after task achievement.

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References


