Literary theory has developed with the development of the times. In traditional literary theory teaching, we always adhere to the “literature is the art of language” and “literature is a reflection of social life.” The essence of literature, the writer, the text, and the interpretation of the content, for example, are established on the basis of the understanding of language, in order to understand the world of literature reflect and express, and the image idea is basically not involved. This paper discusses the teaching of literary theory based on the relationship between language and picture, close to the literary reality to optimize the teaching content, carry out research-based teaching, and cultivate students’ thinking ability and practical ability, so as to explore and innovate the teaching of literary theory. For the objective questions or questions close to the objective questions, the machine is used for marking, while the subjective questions need teachers to mark. In addition, in terms of evaluation, qualitative and quantitative methods are used to comprehensively evaluate learners, and a preliminary evaluation table for students is designed.

1. Introduction

In the long history of human aesthetic ideography, the relationship between the language symbol system represented by the image/word and the image symbol system represented by the image/image is very complicated, and their respective functions in literary ideography show different trends due to the difference of their symbolic attributes. Therefore, in the scientific link of literary ideography, the study of the relationship between language and image may analyze the attributes of the two symbols and thus take it as the starting point to systematically reveal the relationship between language and image in literature and art and the theoretical basis of criticism [1, 2].

In recent years, with the deepening and development of the study of literary imagology, the study of the relationship between language and image has been included in the important stage of the current literary research. In fact, the context of this era includes not only literary studies, but also a variety of humanities and social sciences such as philosophy and sociology, all of which are responding to the study of the relationship between language and picture [3, 4]. In the study of this issue, the depth of the art history is relatively wide, based on which the corresponding new art history is established. The depth and breadth of the discussion on the relationship between language and image are very deep, thus providing different research paths for the development of the current literature imagology [5, 6].

As a symbol to express certain ideas, language signifier is a sound image inseparable from ideas. While the sound image is the psychological imprinting of the physical pronunciation of language, the character fixes the sound image into the visual image with sound. Referring to the process of language symbols is more dependent on social historical and cultural impact of the external factors, but most of these factors depend on the human population characteristics and unique temperament. This kind of expression mode also marked the humans use language symbols of group communication and aesthetic expression way using symbols to communicate with other nature species essential differences.
In contrast, the image is not; the image is first of all a physical phenomenon of physiological-psychological refraction. The generation of images is the result of the interaction between subject and object, while the generation of language is the result of pure socialization. In terms of structure and form, image is quite different from language [9]. Image is a symbol system of “mutual appearance of form and meaning.” Its core element is “image” and its “simulation” function, and its meaning expression also relies on the intuitive examination of the symbol itself and the perceptual connection between subject and object. The image simulates the form and structure of the natural image through shape, color space, and other elements. At the same time, it also presents the external representation of the concept and image [10, 11].

When literature encounters “the age of reading pictures,” the problem that literature faces is not only what language to write and how to write, but the relationship between language and image, which is an urgent realistic problem. Faced with the impact and siege of images, if we still stick to the teaching concept of literature theory like ivory tower, we will not be able to face and answer the fresh and realistic problems faced by literature, which will make the teaching content appear old and empty and fail to stimulate students’ interest in learning [12, 13].

Based on this, in the teaching of literary theory, we should introduce the realistic problems faced by literary theory to students as a core concept, guide students to master the basic knowledge and basic laws of literary theory, broaden their horizons, and constantly stimulate their aesthetic interest [14, 15]. In the author’s opinion, this core concept is a literary theory view based on “the relationship between literature and image,” that is, through exploring and elucidating the complex relationship between literature and image, the coexistence of homology, and the unity of opposites. It focuses on cultivating the critical thinking ability and practical innovation ability of the students of the department of Chinese literature who focus on the reality of contemporary college students are largely based on network technology and practical innovation ability of the students of the department of Chinese literature who focus on the reality of literature, inherit the tradition of literary theory, and face the future of literature [16, 17].

Research-based teaching is a teaching paradigm under the guidance of innovative education theory. It makes full use of the advantages of the previous teaching model and makes students master relevant knowledge and improve their ability to solve practical problems by studying major practical problems. Taking the relationship between language and picture as the main line, research-based teaching aims to guide students to use knowledge and ability creatively through classroom teaching process and to accumulate knowledge, cultivate ability, and exercise thinking in the discussion of problems, so as to achieve creative design of teaching objectives. Problem is oriented to achieve the diversity of teaching objectives [18, 19]. Question is the starting point of all research activities. In the past, classroom teaching often took questions as a means to check whether students have mastered the knowledge and played the role of imparting knowledge. Even guiding students to discover and solve problems is based on theoretical presupposition. For example, the previous lectures on “reflection theory,” “aesthetic reflection theory,” “the relationship between literature and ideology,” and other contents take the teaching idea of essence first, around the original Canon or some abstract concepts to sketch the literary prospect, but ignore the fresh literary reality and the dilemma faced by the development. Research-based teaching is based on realistic literary problems, and teachers guide students to choose topics according to their interests. For example, when explaining literary images, we can choose the TV adaptation of a Dream of Red Mansions as a topic for discussion [20, 21]. In reading and watching classic pieces, with supplementary reading on the basis of some representative academic papers, the teacher carries out special background knowledge counselling, around the treasure jade, dai jade, treasure chai image in the novel text, and TV performance in the text of the similarities and differences, as well as the interaction of the language-figure, and inspires the student to think of two different media and have more in-depth understanding of image. In this way, students master important knowledge of literary images in the process of discussion [22, 23]. In the process of carrying out the practice of thematic research thinking, oral expression, analysis, synthesis, and other aspects of the ability to improve, the comprehensive quality has been further improved. Establish a dialogue relationship between teachers and students with two-way interaction as the mechanism. In research-based teaching, the teacher is the guide and the guide to introduce knowledge, while the students are learners and researchers. As the learning interest and knowledge experience of contemporary college students are largely based on network technology and information dissemination platform, they are sensitive and curious about visual culture and fashion culture and can obtain a large amount of information and resources through the Internet to find the problems and solutions. Therefore, students have full power of speech and expression in some teaching content. For example, in narrative thematic discussion, students’ creative spirit and research ability can be stimulated by teaching content such as text narration and image narration [24, 25]. Hence, this paper designs a literature theory teaching system that integrates self-service learning and testing mode, curriculum learning and testing mode, and selection learning and testing mode. In self-service learning and testing mode, learners can choose questions in the system to study and test independently according to their own needs.

2. Teaching System Design

In the end of 2019, COVID-19 pandemic broke out around the world, and people’s social environments were greatly affected. Due to the epidemic, Chinese primary and secondary schools and institutions of higher learning are unable to provide normal classroom teaching activities as scheduled, making online teaching as the main teaching mode of educational institutions during the epidemic. Therefore, reducing social activities through online teaching is still one
of the main methods to effectively prevent and control the epidemic. In this context, people pay more and more attention to online teaching system, such as Figure 1.

From the point of view of hardware requirements, the online teaching system can be completed only by personal PC during development, and the server requirements are not high after implementation. In terms of software requirements, many of the technologies required for development are open source and free, so the cost of use is not high. From the perspective of the economic value realized after the successful design of the system, this system can greatly save the cost of online teaching, so it is cost-effective; therefore, the system research and development is completely feasible economically. In addition, the framework of the teaching system is based on the currently popular Java development language, which has outstanding advantages of open source, high efficiency, and simplicity. Besides, the technology is relatively mature, and there are many related literatures and cases, which can play a good reference and reference role. Before the project development, relevant technical standards and literature cases have been collected and sorted out, which can basically meet the development and use of the project, so the technical feasibility can be basically guaranteed. In this paper, considering the design and implementation of online teaching system, users are mainly teachers and students with a certain cultural basis, in the operation of the software system with certain ability. At the same time, in the system interface design, this paper will try to consider the user’s use habits, on the basis of not affecting the system function and performance, to ensure the simplicity of the system interface and functional convenience, so the system is basically feasible in user operation. After the completion of course learning and testing and selective learning and testing, students’ scores shall be statistically analyzed, and the parameters of statistical analysis of students’ scores are as follows: calculate students’ test scores, calculate class average scores, divide score segments, count the number of students in each score segment and calculate percentage, count the number of excellent students and excellent rate, and calculate the pass number, pass rate, median, mode, region, standard deviation, etc. These indicators can be used to reflect the current learning status of learners more vividly in the form of charts.

Here are some important indicators:

(1) Average value reflects the overall level achieved by students of this class in the exam, and this value can be used as a reference for comparison of learning levels of different classes.

The calculation formula is to let N test scores be

\[ x_1, x_2, \ldots, x_N. \]  

The average score is

\[ \bar{x} = \frac{1}{N} (x_1 + x_2 + \ldots + x_N). \]  

The above equation can also be written as

\[ \bar{x} = \frac{1}{N} \sum_{i=1}^{N} x_i. \]  

(2) Median refers to the score in the middle of the test score ranking, which can be used as the representative value of the test score, reflecting the general level.

(3) Mode is the score that appears most frequently in the test results. It reflects a central tendency in test scores.

(4) Region: the difference between the highest and lowest scores reflects the biggest gap in learning outcomes of all the current test takers.

(5) Standard deviation: standard deviation reflects the overall distribution of test scores, or the degree of dispersion of test scores relative to the mean. The larger the standard deviation is, the greater the difference between good and bad grades is; that is, the more imbalanced the distribution among students is; thus it can be seen that the distance between learners is larger. In addition, standard deviation can also be used to compare students’ two test scores. Since students have different test papers, standard deviation can be used as the basis to convert the two test scores into standard scores to judge whether students have made progress in the learning process.

The standard deviation is calculated by the following formula:

\[ S_x = \sqrt{\frac{1}{N} \sum (x_i - \bar{x})^2}. \]  

The difficulty of the questions can be expressed by the correct answer rate of the students to the questions. The calculation formula is as follows:

\[ p_i = \frac{x_i}{S_i}, \]  

where \( p_i \) is the difficulty of problem \( i \); \( x_i \) is the average of the correct answers to question \( i \); \( S_i \) is the total score for problem...
i. We consider a parameter that measures the ability of students at different levels to grasp knowledge. Students with good grades get high marks, and students with poor grades get low marks. The calculation formula is

$$D_i = \frac{H_i - L_i}{S_i},$$

(6)

where $H_i$ is the average score of the correct answer to question $i$ in the high group; $L_i$ is the average score of the correct answer to question $i$ in the lower group; $S_i$ is the total score of question $i$; $D_i$ is the distinction on problem $i$. Reliability indicates the reliability of the test. The higher the accuracy of the test, the higher the reliability of the test. It reflects the stability and reliability of the test. The calculation formula is

$$T = \frac{N}{N-1} \left[ 1 - \frac{\sum_{i=1}^{N} D_i^2}{N} \right],$$

(7)

where $N$ is the total number of problems. Validity is a parameter used to measure the validity and correctness of a test. The calculation formula is

$$E = \frac{1}{N} \sum_{i}^{N} D_i,$$

(8)

where $N$ is the total number of questions. $D_i$ is the distinction of problem $i$; $E$ is the validity of the test paper. The difficulty of the paper can be reflected by the average difficulty of the paper. The calculation formula is

$$P = \frac{1}{N} \sum_{i}^{N} P_i,$$

$$\sum_{i=1}^{K} A[i] \cdot B[i] = G,$$

(9)

$$C[i, j] - \partial \leq D \leq C[i, j] + \partial.$$

The classical measurement theory is based on the true fraction theory and is built on the linear relationship between real score, true score, and error score. Its mathematical model is as follows:

$$X = T + E,$$

(10)

where $X$ is the real score, $T$ is the true score, and $E$ is the error score.

### 3. System Framework

In order to ensure the upload and play of course media under the condition of high concurrency of big data, the teaching management module also covers the Hadoop framework based on cloud computing distributed system and file reading, as well as the optimization of load balancing algorithm. The module consists of three submodules: online teaching, video uploading, and video maintenance. Online teaching, including course information, is carried out by students through the online teaching interface, so that the online teaching function depends on the entity of course information. Video uploading by teacher through the video uploading interface also includes course information, so that the video uploading function also depends on the course information entity. Video maintenance performed by administrators on the video maintenance interface also includes course information, so that the video maintenance function also depends on course information entities. According to the dependence of the teaching management module function on the data entity, the attributes of the course information entity can be analyzed based on the design of the course information in the database.

The functional module of data management is composed of three submodules: student’s homework, teacher’s homework, and job maintenance. The distributed system of cloud computing based on Hadoop framework and file reading and writing method proposed in this paper are also introduced, as well as optimized load balancing algorithm. Student user can operate student’s homework through student’s homework interface, including homework information, so student’s homework function depends on homework information entity. The operation of teacher’s homework by teacher user through teacher’s homework interface also includes homework information, so the function of teacher’s homework also depends on homework information entity. Job maintenance operations performed by administrators on the job maintenance interface also include job information, so the job management function also relies on job information entities. According to the dependency of the job management module on the data entity, the attributes of the job information entity can be analyzed as the basis for the design of the job information data table of the database.

The system adopts the autonomous learning and test module, and the so-called self-help is in the specific system environment; according to the demand of oneself independently accomplishing a task, in this module the learner can choose according to their own needs the corresponding questions to study and test, and the conditions enable the learners to choose a course content condition, question topic condition, and item difficulty. That is, these three groups of paper conditions form the test questions that learners need to learn and test. It is not enough just to provide the reference answers for learners, but more importantly, to help learners understand the real problems of the test questions.

In this module, to help learners learn and test, we provide the following functions. (1) Extract test questions: according to the value that the learner fills in the selection condition, the corresponding test questions are extracted from the question extraction algorithm. (2) Test timing: display the test time and remaining time used by learners, and specify the test within the specified time range. If the time exceeds the specified time range, the system will automatically save the results of students’ answers. (3) Test submission: the results of individual answers are stored in the system for the convenience of marking and evaluation. Answer the idea. Students in the process of test learning will inevitably encounter some problems without ideas to solve the problem and then provide students with some ideas to
solve the problem, which is conducive to students to save
time and improve efficiency. (4) Reference answer: provide
reference answers to test questions for students to check
their answers.

When learners do not have solutions to the questions, it
provides solutions for learners and provides motivation for
learners to further answer the questions. To analyze the
reference answer, eliminate the doubts in the hearts of
students, so that students have a more comprehensive un-
derstanding of the connection between knowledge, knowl-
edge mastery, and mastery of knowledge.

The system also contains course learning and testing
modules. Curriculum learning and testing is a set of learning
and testing mode, which is the network transfer of tradi-
tional testing, and based on the paper formation strategy it is
the traditional test paper formation strategy (a two-way
detail table); this module is mainly to help learners to check
the stage of learning results and deepen the understanding
and mastery of knowledge. In this module, learners can not
only study and test the papers composed by teachers, but
also study and test the real questions of midterm technical
exams in the past years.

In this module, we provide the following subfunctions:
(1) Extract test questions: this function is generally taken
charge of by teachers, who can correct questions that do not
meet the test requirements by extracting questions from the
test questions resource base according to the two-way list.
(2) Test timing displays the time questions used by learners
for tests and submits student tests for responses within the
prescribed time. (3) Test submission: learners can submit
their own test answers within the specified time, or the
system can automatically save learners’ test answers when
they arrive at the specified time, for later marking and
evaluation. Answer the idea: in the study of test questions,
when learners have no clue in the face of the topic, ap-
propriately giving learners hints can stimulate students' in-
terest in learning, expand their learning thinking, and
improve their learning efficiency. (4) Reference answer:
provide reference answers for students to judge their own
answers. (5) Personal answer: show the results of the answers
so that learners can compare their personal answers with the
reference answers.

Help students understand the misunderstandings in the
answer, enrich the connection between knowledge points,
and integrate mastery and application practice. Provide
reference answers for the test questions done by learners, so
that learners can check their answers with reference answers
to find out their own shortcomings and deepen their un-
derstanding of knowledge.

The system also includes optional learning and testing
modules. Selected learning and testing is a kind of com-
prehensive learning and test mode; the model is based on the
selected test and can be fixed mode test (graduate) selected
learning and testing, in a fixed mode of learning and testing,
we provide two ways of learning and test papers: one aspect
is the fixed model of examination paper composed by
teachers according to selective learning and test paper group
strategy. Another aspect is the study and test of selective real
questions over the years. The purpose of this module is to
help learners deepen their understanding of knowledge and
then get good results in the selection test and have an ad-
vantge in the selection competition.

4. Simulation Experiment Analysis

“Literary theory guidance” is the basic theory of Chinese
language and literature professional courses; through the
study of this course, learners can gain a systematic
knowledge of literary theory, to deepen students’ under-
standing and the understanding of literature and to help
students establish a scientific concept of literature, and its
importance is beyond doubt. In order to ensure the quality
of learning, it is necessary to develop a learning and evaluation
system platform for learners. In view of this, we seek to
enable the platform to provide multilevel networked testing,
learning and evaluation services for learners, to meet the
needs of learners in all stages of learning and evaluation.

Because this system is based on “literature theory
guidance,” this course is an example of design and develop-
ment, so in the survey object, we mainly include uni-
versity Chinese language and literature students; in the
research level, for both undergraduate students and also
graduate students, the research object has a certain uni-
versality and representativeness. The survey results can re-
fect some of the needs of learners for the system.

Figure 2 shows the basic situation of the online class
users: male students account for 32.4% and female students
account for 67.6% (see Figure 2). Han nationality accounted
for 87.2%, and ethnic minorities accounted for 12.8% (see
Figure 2). Among the students surveyed, 62.5% were un-
dergraduates and 37.5% were postgraduates (see Figure 3).

At the same time, this teaching system has done an
online survey on the distribution of the test questions of the
course “Literature theory Guidance” to the question "Have
you taken an online adaptive test?" The net answer of the
question: 18.3% of the students chose to participate in the
adaptive examination, while 81.7% of the students chose not
to participate in the adaptive examination. It can be seen that
the vast majority of students did not participate in the white
adaptive examination.

For the students who have participated in the above,
according to the student experience, and the existing
adaptive examination system of the deficiencies of the in-
vestigation: 34.6% of the students think that most of the
examination system does not provide learning function,
42.3% of the students think that the existing adaptive ex-
amination system needs to be improved in terms of adap-
tation, and 23% of the students think that the interface of the
existing examination system is too monotonous. 35.8 per-
cent of students believe that the existing adaptive testing
system does not provide good communication skills. Show
learners' answers in the test, so that learners can judge and
understand the answers according to the reference answers.

To the question “What questions would you prefer to
have in the test bank?,” the answers to questions were the
following: 35.2 percent of the students chose multiple-
choice, 29.4 percent blank, 39.7 percent noun explanation,
45.3 percent discrimination, 43.6 percent analysis, 41.7
Figure 2: Gender and nationality comparison.

Figure 3: Grade comparison.

Figure 4: Testing types.
percent essay, 41.7 percent essay, and 53.1 percent argument; reading analysis accounted for 60.4%; and other types accounted for 24% (see Figure 4).

In addition, the system studied was optimized in this paper. As can be seen from Figure 5, compared with the model before adjustment, the error rate of type 1, type 2, type 3, type 4, type 5, and type 6 in the training dataset decreased by 0.049, 0.021, 0.011, 0.015, 0.003, and 0.022, respectively. The error rate of category 1, category 2, category 4, and category 6 in the test dataset decreased by 0.025, 0.025, 0.025, and 0.033, respectively, thus achieving the purpose of model optimization. The scale of data processed in this paper is large, and the evaluation of the model is carried out from the following aspects.

Stability is mainly reflected by the degree of difference between the results of training samples and test samples. The error rate difference between training samples and test samples is small, so it is relatively stable. The greater the difference in error rate between training samples and test samples is, the more unstable the system will be.

Accuracy is mainly reflected by the total error rate. The higher the total error rate, the lower the accuracy. Conversely, the lower the total error rate, the higher the accuracy. Provide reference answers for the test questions done by learners, so that learners can check their answers with reference answers to find out their own shortcomings and deepen their understanding of knowledge.

For the model in this paper, in terms of stability, the total error rate of the training sample is 175, while that of the test sample is 238, which is within the controllable range. The model is generally stable. In terms of accuracy, the error rate of training samples and test samples is less than 10%, indicating relatively high accuracy. This can also be seen from Figures 6 and 7.

5. Conclusion

At present, the teaching of literary theory must face the relationship between image and language and actively solve this important realistic problem, so as to explore the innovative way of literary theory teaching. However, this does not mean that some basic problems of literary theory are cancelled and the advantages of traditional teaching mode are ignored. On the contrary, we should combine the advantages of traditional literature theory teaching, so that the literature theory teaching based on the relationship between language and picture and the main line should return to the realistic problems faced by literature, inspire and encourage students to think about the realistic problems, and cultivate their innovative consciousness and ability.

However, due to the limitation of time and development experience in the system functional design, this paper only develops and realizes the basic functions of online teaching, without considering short-term commercial application. Therefore, in the future research and work, we can optimize and expand the functionality and practicability of the system according to the actual application requirements of the industry and fully combine the current cutting-edge technologies such as Internet of Things teaching and artificial
intelligence, so as to realize a more intelligent online teaching system.

Data Availability

The dataset can be accessed upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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