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Juan Liu

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Multi-objective construction of English online autonomous learning based on mobile intelligent information system

Juan Liu

School of Economics and Management,
Shandong Huayu University of Technology,
Dezhou, 253000, Shandong, China
Email: panxiuzhen@126.com

Abstract: With the spread of English around the world, people's demands on English are increasing day by day. For Chinese people, English is not their mother tongue, so English learning would become very difficult. There are two reasons for this difficulty, one is the subjective initiative of English learning, the other is the lack of understanding of English learning methods. This paper started with English learning methods and focuses on the current situation of English autonomous learning. On this basis, this paper used mobile intelligent information system to find and improve some problems in English teaching. Through the performance test of the English autonomous learning system, it was found that when the number of concurrent users reaches 1,000, the network utilisation rate of the system increased from 5% to 55%, which reduced the use of the entire system by 50%. On the basis of 1,000 terminals, the average memory utilisation rate and CPU utilisation rate reached the highest value, 45% and 57% respectively. Therefore, the application of English online autonomous learning is the most important topic at present.

Keywords: English web-based self-directed learning; mobile intelligent information systems; self-directed learning indicators; artistic intelligence; multimedia technology; multi-objective optimisation.

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Biographical notes: Juan Liu holds a Master's degree and is an Associate Professor in Shandong Huayu University of Technology. Her research areas and interests include business English, educational teaching, higher education and public administration

1 Introduction

With the rapid development of network technology, the rapid development of computer application and the continuous expansion of network wide application, learners urgently need to use these technologies to carry out auxiliary teaching, so as to improve learners' enthusiasm for learning, make full use of extracurricular time for autonomous learning, develop a simple and effective English learning environment, and improve students'

English autonomous learning ability has become a very important teaching reform topic. Interest plays a very good role as a non-existent teacher in English autonomous learning. When students become interested in English autonomous learning, they would actively absorb knowledge under the guidance of interest, and at the same time can trigger the brain's sensory activity to the highest state. It can improve the attention of learning, activate thinking, enrich imagination, strengthen memory, restrain fatigue, and produce a comfortable feeling, so that students are in an optimal state when receiving teaching information. Therefore, this paper puts forward the important goal of stimulating students' interest in English autonomous learning and making students enjoy learning.

The platform design incorporates principles from Zimmerman's cyclical self-regulated learning model, operationalising its three-phase structure through technical implementations. The forethought phase is supported by goal-setting modules and prerequisite diagnostics that scaffold learning planning. Performance phase features include real-time progress tracking and cognitive engagement analytics aligned with metacognitive monitoring theories. Self-reflection mechanisms embedded in the assessment system facilitate the reflection phase through automated feedback generation and comparative performance visualisation. This theoretical integration ensures the platform transcends mere content delivery by actively fostering self-directed learning competencies. The technical architecture systematically translates psychological constructs like self-efficacy and task strategy into measurable interaction patterns and adaptive system responses.

2 Related work

It is one of the hot topics to study English autonomous learning model by using computer technology. Among them, Nagauleng and Waris (2022) aimed to discuss how independent learning in online English classroom can be put into practice in schools, and find out students' views on independent learning in online English classroom. Nipaporn and Gary (2020) aimed to develop online teaching media for autonomous English learning in higher education. He investigated students' satisfaction with the use of online teaching media for autonomous learning of English in higher education, and compared the students' academic achievements of the control group and the experimental group using online teaching media for autonomous learning of English in higher education. The purpose of Yean's (2019) research was to break through the negative views on the use of mobile intelligent information systems and improve the learning effect by promoting active English learning. Moenardy et al. (2022) aimed to discuss the impact of multiple indicators on English online autonomous learning. Mutambik (2018) conducted an empirical survey through group interviews with students and teachers to deeply understand their views on the role of e-learning in learning English as a foreign language (EFL) in Saudi Arabia. However, due to the lack of data sources, the above research is only in the theoretical stage and has no practicality.

It is very innovative to use mobile intelligent information system to study English autonomous learning. Yang and Quadir (2018) has developed an educational game based on MMORPG to promote English learning. The purpose was to study how students' previous knowledge at different levels, that is, their previous English ability and online game experience affect their learning. Lamb and Fauziah (2020) reported a research project, which investigated how Indonesian metropolitan youth use English online, and

how it relates to their global motivation to learn English, especially their attitude towards classroom English lessons. Ahmedovna (2022) aimed to improve vocabulary knowledge through various methods. At the same time, the development of knowledge would also make the concept of words more extensive, and people who have made many achievements in this regard would also become a language expert. Nartiningrum and Nugroho's (2020) research explained the challenges, suggestions and materials required by 45 autonomous English learning students in these online courses. However, due to the traditional thinking and definition, English autonomous learning and mobile information systems can not be highly integrated and give full play to their advantages.

The fundamental advancement points of this paper are as follows:

1 In view of the useful improvement of Moodle open source educational plan the board stage, this paper leads a top to bottom concentrate on it, and examines its auxiliary improvement innovation, lastly finishes the plan and execution of the English organisation autonomous instructing stage.

2 As per the advancement of the current English web-based independent learning stage in China and the ongoing circumstance of China's e-training informatisation development, this paper proposes an open source and free programming stage that completely conforms to the PC program library (CPL) and overall population permit (GPL) conventions, and further develops the English internet-based independent learning stage on this premise.

3 The hypertext preprocessor (PHP) and web technology are used to expand and integrate the functions of the platform according to different needs, so as to finally realise an English autonomous learning platform for current college students.

3 Construction of English autonomous learning platform

3.1 Framework design of mobile intelligent information system

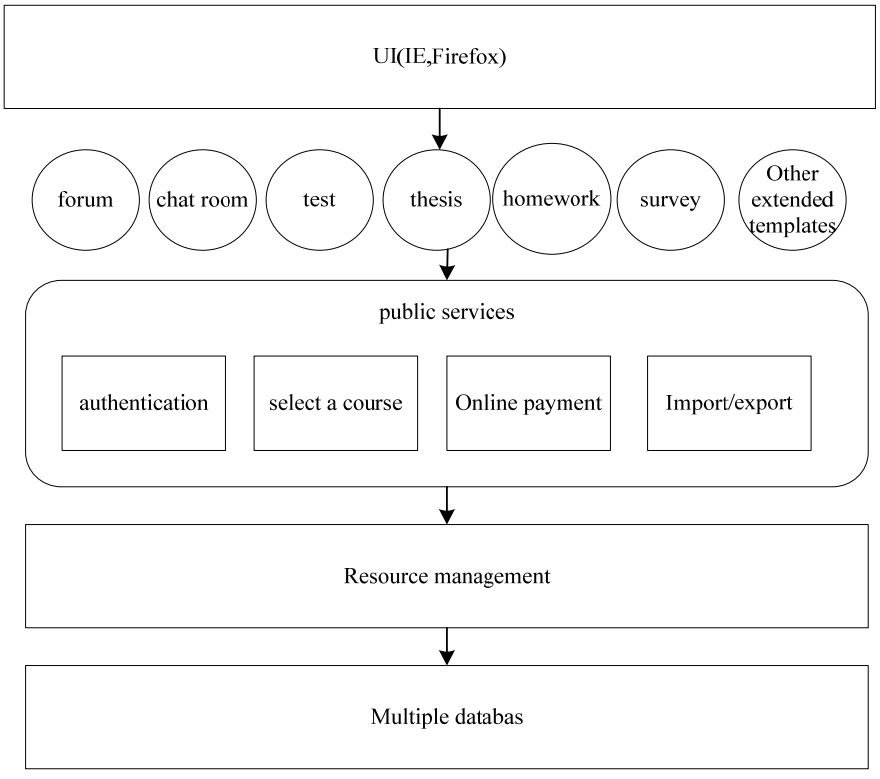
The mobile intelligent information system has the following characteristics: it can run on different platforms, and is easy to install, learn, modify, etc. Therefore, its architecture is shown in Figure 1.

It can be seen from Figure 1 that mobile intelligent information system is a mature B/S model, which requires a complete business logic level. This paper is the analysis of its core business logic. On a common platform, the first thing to consider is the allocation of authorisation. Therefore, in mobile intelligent systems, how to determine authorisation is an important business logic (Zou and Xie, 2019; Sinaga and Reza, 2021). In the mobile intelligent information system, the permission determination function is used to determine the permission, and the 'Moodle/Site: confg' is determined according to the context of the access.

The system architecture incorporates adaptive solutions to accommodate linguistic diversity and connectivity constraints. For dialect speakers, the platform integrates a Mandarin-English transition layer in the speech processing module, trained on diverse accent datasets to ensure accurate recognition. Content delivery employs a multi-bitrate streaming protocol that automatically adjusts based on real-time network diagnostics. Learning materials are cached locally during connectivity windows for offline access,

with synchronisation triggers upon network restoration. Interface text supports simplified and traditional Chinese conversion to bridge regional variations. The assessment engine applies dialect-aware scoring algorithms that distinguish pronunciation deviations from grammatical errors. Network optimisation includes data compression algorithms reducing bandwidth requirements by 40% compared to standard implementations, while maintaining content fidelity. These technical adaptations ensure equitable access across China's varied linguistic and infrastructural landscape.

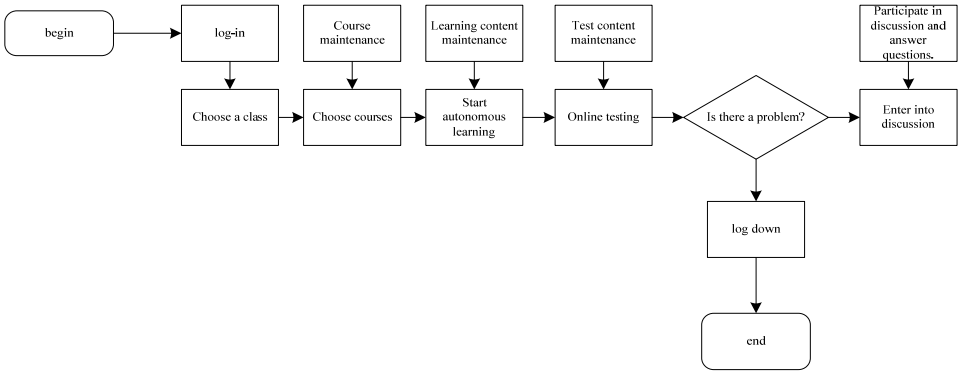
Figure 1 Mobile intelligent information system architecture



3.2 System business process

After a detailed analysis of the whole system architecture, the operation process of the whole system is analysed accordingly. When designing the whole system, it should analyse the role of each link to understand its operation mode and the overall operation mode. It makes the overall process of the system more logical, and the connection between various functional modules is orderly, so that it is convenient to find the source of information and master various forms of information (Aminatun and Lulud, 2019; Ayu, 2020). After the general business process analysis is completed, the main business relationships and processes can be analysed, as shown in Figure 2. The specific process is shown in Figure 2.

Figure 2 Main business flow chart of English online autonomous learning platform



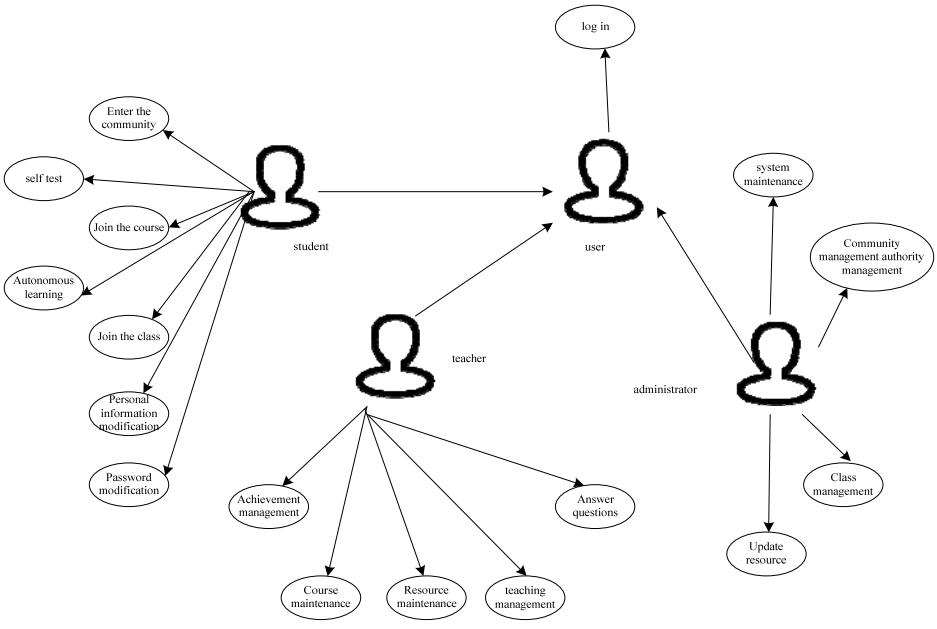
As shown in Figure 2, students are the main body of autonomous learning. After registering for this article, you can enter the system. The system will initialise the students in the initial stage, but they can also be modified after login. Before the official start of independent learning, you should choose a class first. Different levels, different progress, and different teachers will have different learning content. Therefore, students are the main body of the English self-learning platform. When selecting courses, the framework will update the data of the substitute players themselves in time, allowing educators to understand the learning status and growth experience of the substitute players. After entering the study room, it should take a course. Since English teaching is the foundation of autonomous learning in English organisations, learning content should be strengthened to meet the needs of various learning developments, and expertise in English listening, conversation, close reading, writing, and translation should be strengthened at the same time (Wang and Chen, 2019). The main maintenance work of general courses is the responsibility of the administrator, but teachers have the right to add, delete, update and other content. After completing the course selection, students can study independently. During this process, the students' grades are uploaded to the database, so that teachers can have a comprehensive understanding of the students' learning ability. After independent learning, students can judge their own learning status through self-test. The system will constantly update the student data and record the student's study and examination situation. Teachers can adjust the learning content according to the score, and the administrator has the most authority over the test content. After completing the self-examination, students can decide whether to participate in the group discussion according to their own conditions. If students have any questions, they can ask online teachers or students. This is the core business process of the English self-learning platform, and the specific work process and data structure are designed accordingly.

3.2.1 UML modelling

Structural analysis is an important content of object-oriented analysis and design. From the perspective of system business functions, modular analysts are essential. Since English learning needs to be subdivided into four abilities: listening, speaking, reading, writing, and translating, this paper must follow the idea of object-oriented development when designing the English self-learning platform, and separate each module for future

maintenance. Updates and modifications can be quickly adjusted. UML model is an important part of object-oriented structured development, which provides model and visualisation support for system development, including requirements analysis, construction, configuration, etc. (Lo and Hew, 2018). This article uses the use case model to describe the functional requirements required by each role in the requirements analysis process. In the requirements analysis process, this article uses the use case model to describe the functional requirements required by each role machine. After completing the requirement analysis of the system, use the UML modelling method to design the system for the user, as shown in Figure 3.

Figure 3 User use case model of English online self-learning platform



After completing the user use case diagram, this paper can well understand everyone's role in the English network, but does not describe its specific functions in detail. Therefore, this paper gives a complete student domain model on the English network autonomous learning platform, as shown in Figure 4.

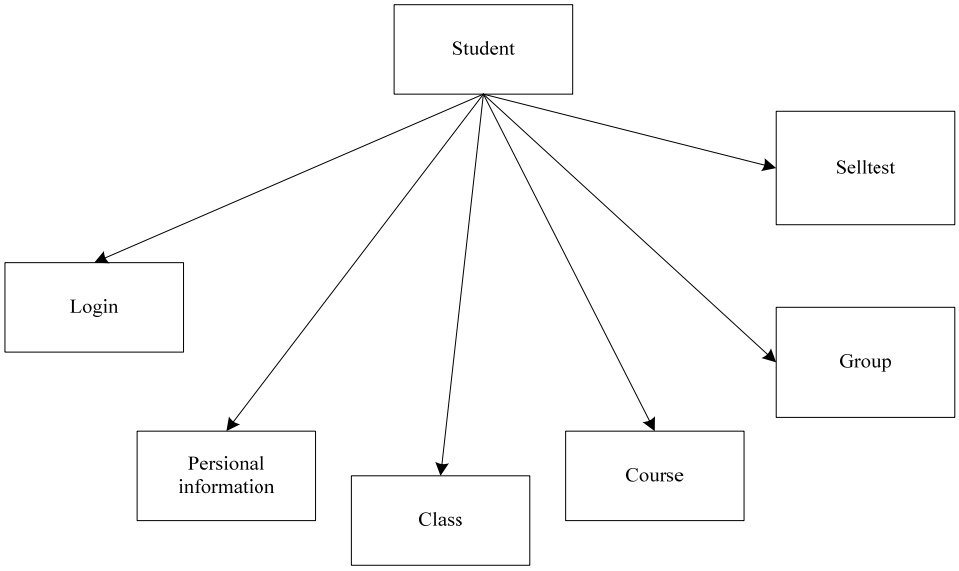
From Figure 4, it can clearly see the specific relationship between each functional module and user, as well as the specific functional categories between each functional module and user, and define the relationship between each type and object.

3.2.2 The design of English online autonomous learning platform system

After the achievability investigation, this paper discovered that the English web-based independent learning stage can be understood, and as indicated by the overall programming advancement innovation, it concentrated on the prerequisites examination, business process examination, UML demonstrating and different perspectives. This has at first shaped the general system of the English internet-based independent learning stage,

and planned the English independent learning stage as per the innovation of computer programming.

Figure 4 Student domain model of English online autonomous learning platform



To work on the convenience of English web-based independent learning stage, English independent learning stage ought to embrace the most famous B/S structure as of now. It is very simple to use the existing mobile phone intelligent system to build the foundation. In addition, the current browser technology has developed to a mature level, and only the same code needs to be analysed.

In the B/S system, the whole system is divided into three layers, namely, the presentation layer, the business logic layer and the data layer. The main advantage of the B/S structure is that it is easy to implement a modular architecture, which meets the characteristics of high cohesion and low coupling. In addition, the three-tier architecture of the B/S architecture can be implemented as long as the interface communication is realised (Vien et al., 2019; Agung et al., 2020). At three levels, all user information is stored in the data layer to ensure the independence and security of data. The presentation layer talks with the data layer through the business logic layer, so that users do not have to communicate with the data directly. Users are only at the presentation layer, and can only see the information provided to users after the business logic layer has completed processing. At the same time, users do not need to carry out certain resource management on business logic, that is, users can use system transactions at anytime, anywhere, under any conditions, as long as they meet the minimum requirements of the open expression layer. All transactions are handed over to the business logic layer. Although it would bring some pressure to the business logic layer, it would also make full use of resources, and only need to update, maintain and modify the business logic layer in a modular way, which is to make users more convenient.

From the perspective of functional requirements, the English autonomous learning platform is mainly for students, teachers and administrators. If the three different

functions are subdivided, these functions can be divided into two parts: the foreground and the background. Course management, class management, authority management, etc. are user oriented, so these functions are user oriented, only open to administrators, and teachers can also use them. In other words, students are front-end users of the English online learning platform, while administrators are back-end users of the English learning platform (Bailey et al., 2021).

3.2.3 System database design

The user information, class information, course information, learning resources, examination results, etc. of the English learning platform is all based on data. In order to understand the productive use and the executives of information assets, it is important to involve the dataset for information assortment, handling, capacity, handling and other work, and to naturally incorporate with every module of the English organisation free learning stage, which advances higher necessities for the plan of the dataset framework.

Understudies are the fundamental clients, so while planning the understudy data table, it ought to completely think about the connection between understudies in each practical module, and set unfamiliar keys in the comparing relationship, including essential key, unfamiliar key, client name, secret key, consent level, age, address, phone, email and other data, as shown in Table 1.

Table 1 Student information data sheet

Name	*Data type*	*Length*
Userid	Int	25
Testid	Int	50
Classid	Varchar (50)	50
Department	Varchar (50)	25
Slid	Int	50
Username	Varchar(50)	50
Password	Varchar(50)	50
Permission	Smallint	50
Age	Smallint	25
Address	Varchar(50)	50
Telephone	Int	25
Email	Varchar (50)	50

Class information data should include class primary key, foreign key, class name, class introduction, class including courses, number of people, department, major, department number, class entry requirements and other class related information, as shown in Table 2.

The course information data should include course primary key, foreign key, course name, course introduction, course score, learning progress, course content and other course related information. The course information is shown in Table 3.

In order to solve the above problems, this paper uses a business flow chart based on functional requirements analysis to find out whether the data relationship between entities

in the business process is one-to-one or one to many through the analysis of data relationship.

Table 2 Class information data sheet

Name	*Data type*	*Length*
Classid	Varchar(50)	50
Userid	Varchar(50)	50
Course	Varchar(50)	50
Department	Varchar (50)	50
Classname	Varchar(50)	50
Classinfo	Varchar (50)	50
Count	Int	25
Classno	Int	25

Table 3 Course information data sheet

Name	*Data type*	*Length*
Course	Varchar (50)	50
Userid	Int	25
Coursename	Varchar(50)	50
Courseinfo	Varchar(50)	50
Content	Text	0
Score	Float	50
Studyprocess	Varchar (50)	50

The system employs strong privacy protection measures to ensure the security of student data. All personal information stored in the database, including user credentials and learning records, is encrypted using the AES-256 standard to prevent unauthorised access. The platform implements strict access controls, anonymises data for analytical purposes, and allows users to view or delete their data upon request. The system maintains an audit log to track data access and modifications, further enhancing accountability. These measures comply with international data protection frameworks while maintaining the performance and availability of the system.

3.3 Algorithm analysis based on mobile intelligent information system

3.3.1 Logistic regression model

3.3.1.1 Model introduction

Linear regression (LR) is to multiply each feature or attribute in the training sample set by the parameter, and add the results as the output result. Logical regression is the linear regression of fitting a data point from a straight line, which is called linear regression (Aghajani and Mahsa, 2018). The general form of the model is:

$$h(x) = w_0 x_0 + w_1 x_1 + w_2 x_2 + \ldots + w_m x_m \tag{1}$$

It is expressed as:

$$h(x) = w_T x \tag{2}$$

Therefore, namely:

$$g(z) = \frac{1}{1 + e^{-wx}} \tag{3}$$

The logistic regression model's probabilistic formulation directly addresses key educational prediction tasks. Student engagement levels serve as the binary outcome variable, with platform interaction metrics as predictor features. The sigmoid transformation maps raw activity scores to engagement probabilities, enabling early identification of at-risk learners. Feature weights quantify the relative importance of different learning behaviours, with time-on-task and resource access frequency emerging as dominant predictors. The model's additive property allows combining heterogeneous data sources while maintaining interpretability. Regularisation terms prevent overfitting to sparse educational data, ensuring generalisability across student cohorts. Decision thresholds are calibrated to institutional retention standards, balancing intervention sensitivity with resource allocation efficiency. This mathematical framework supports data-driven pedagogical adjustments while preserving transparency for educational stakeholders.

3.3.2 Model training

Assume there are i preparing tests, and the likelihood of event of each example adjusts to Bernoulli appropriation, $p(y_i = 1|x_i)$ represents the likelihood of event of positive class, then the likelihood of event of negative class is $1 - p(y_i = 1|x_i)$, and the back likelihood of each example is:

$$p(y|x, w) = p\left(y_i = 1|x_i\right)^{y_i} \left(1 - p\left(y_i = 1|x_i\right)\right)^{1-y_i} \tag{4}$$

Then the maximum likelihood function of the sample is the posterior probability product of each sample, namely:

$$L(w) = \prod_{i=1}^{m} p\left(y_i = 1|x_i\right)^{y_i} \left(1 - p\left(y_i = 1|x_i\right)\right)^{1-y_i} \tag{5}$$

Logarithmic likelihood function:

$$l(w) = \sum_{i=1}^{m} \log p\left(y_i = 1|x_i\right)^{y_i} + \log\left(1 - p\left(y_i = 1|x_i\right)\right)^{1-y_i} \tag{6}$$

It is expanded and solved, and the derivative of w is obtained:

$$\frac{\partial l(w)}{\partial w} = \sum_{i=1}^{m} \left(y_i - g(z)\right) x_i \tag{7}$$

If the differential is 0, it cannot find w, so it must use the optimal algorithm to find w. In data mining, regression analysis is a common data mining method. At present, regression

model technology has been widely used in various industries, such as internet education, internet finance, advertising and recommendation, medical care, telecommunications and other industries. For example, for online learning in MOOC schools, using relevant data and mathematical models to predict the dropout rate of students, teachers can make decisions or take measures to make students go to class as much as possible (Ebadi and Saba, 2018). The regression model can also predict students' learning performance from relevant materials of classroom and after-school behaviours.

3.4 Platform maintenance and update mechanism

The platform adopts a cloud-based deployment model to optimise maintenance costs, with infrastructure expenses scaled dynamically according to user load. A dedicated technical team monitors system performance through real-time dashboards that track server health indicators and usage patterns. Version updates follow a quarterly release cycle, with each iteration undergoing rigorous testing in a staging environment before production deployment. The modular architecture enables component-level updates without full system downtime. Maintenance windows are scheduled during low-usage periods to minimise disruption. Automated rollback procedures ensure system stability if updates encounter critical issues. All technical documentation undergoes biannual review to align with operational requirements.

4 Multi-objective test construction of English autonomous learning platform based on mobile intelligent information system

4.1 System test

In order to find out the problems in the development process of the English autonomous learning platform, and timely find and correct these problems before application, so as to improve the overall level of the system, this paper would use software testing methods and principles to test the English autonomous learning platform. With the development of software testing technology, there are many kinds of testing methods, and their characteristics are increasingly diverse. Therefore, using appropriate testing methods can improve the efficiency of testing work.

- Unit test: unit test is a minimum scale test method, which can be used to test a certain function of English online autonomous learning system and the use of its code. This test is generally performed by programmers rather than testers, because programmers can test the code of each functional module separately to verify whether each program block can perform the corresponding function.
- Integration test: integration test is to put all parts of the software together and conduct common tests to judge the conflicts between functional parts. Integration test is a logical unit test. Comprehensive testing usually takes a simple way. It combines two units that have passed the unit test to form a component, and tests it to determine whether there are contradictions. In the integration test, the fusion degree of each functional module, the compatibility degree between each functional module and the connection of each functional module can be detected.

- System test: system test is a black box test based on the overall system requirements, which must cover all components. In order to determine whether the system meets the requirements and there is no discrepancy with the requirements and specifications, the system test should conduct corresponding tests on the entire product system.

The performance evaluation was conducted in a standardised test environment configured with a 6248R processor (clocked at 3.0 GHz), 256 GB of DDR4 memory, and 1 TB of NVMe SSD storage. Network connectivity was maintained over a 10 Gbps fibre backbone with latency less than 1 millisecond. The software stack consisted of the CentOS 7.9 operating system, Nginx 1.20 web server, MySQL 8.0 database, and PHP 7.4 runtime environment. Load balancing was implemented using HAProxy 2.4 and a round-robin scheduling algorithm. Virtualisation was enabled via Docker 20.10 containers with resource limits of 8 CPU cores and 32 GB of memory per instance. Network bandwidth was throttled using the tc command to simulate various connection conditions from 1 Mbps to 100 Mbps. This configuration was kept consistent across all benchmarks to ensure comparability of results.

4.2 Test contents and results

The main goal of this test is to test the function, interface, security and other aspects of the completed Moodle English autonomous learning platform, and compare it with the development requirements document to find the existing problems and deficiencies.

4.2.1 Security test

In security testing, testers use different identities of authorised and unauthorised users to enforce different permission requirement functions to check whether their permissions and data are normal.

Table 4 Safety test results

Test category	*Vulnerability type*	*Test method*	*Risk level*	*Mitigation status*
Injection	SQL injection	Automated penetration testing	High (CVSS 8.2)	Patched
Cross-site scripting	Stored XSS	Payload injection verification	Medium (CVSS 6.1)	Resolved
Cross-site request forgery	CSRF	Token validation testing	Medium (CVSS 5.9)	Implemented
Authentication	Brute force	Credential stuffing simulation	High (CVSS 7.5)	Lockout enforced
Data exposure	Sensitive data leak	Directory traversal attempts	Critical (CVSS 9.3)	Encrypted
Access control	Privilege escalation	Role switching experiments	High (CVSS 8.1)	Audited

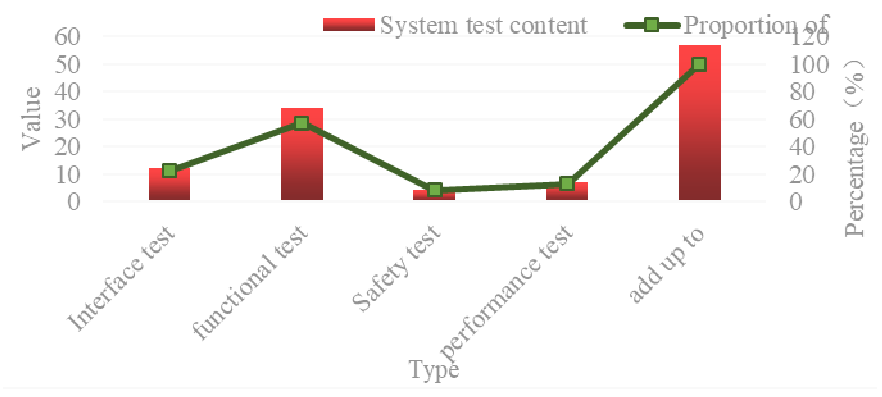
In the wake of finishing the fundamental capability test, this paper would direct comparing security tests for normal security weaknesses, including normal capability

modules, getting to the relating content through the program, and acquiring higher consents through the program. The experimental outcomes are displayed in Table 4.

4.2.2 Performance test

In this test, a sum of 57 experiments were planned, including connection point test, useful test, security test, execution test, and so forth. Use case content distribution is shown in Figure 5:

Figure 5 Test case distribution diagram (see online version for colours)



It can be seen from Figure 5 that the most content of system testing is function testing, with a peak value of 34, accounting for 57%, while security testing is the lowest, with a value of 4, accounting for 8%.

The original purpose of the English online autonomous learning platform is to make it popular across the country and let more students learn English. Therefore, this platform must be targeted at the vast number of users and tested in concurrency, stability and other aspects.

In execution testing, client equal testing incorporates two stages: load testing and stress testing. Its job is to ceaselessly increment clients, so the framework load is expanding until unsuitable, which could test the simultaneousness of common clients and cut off the simultaneousness of users is typically essential.

Capability: clients can get to the site from various locales simultaneously to guarantee that the site can be gotten to typically.

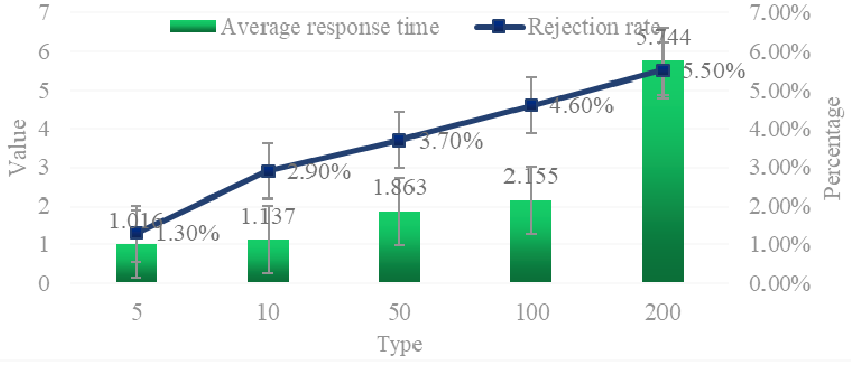
The object is to test whether it is typical for 200 clients to get to the English web-based independent gaining stage from various locales simultaneously.

Techniques: the Apache seat test site in the Wamp climate was utilised for simultaneous admittance to test the typical time and transmission capacity expected for access, and the presentation of the site was examined utilising test information. The integration test results are shown in Figure 6.

In execution testing, server execution testing is an exceptionally basic connection, including load testing and stress testing. It mostly reproduces the utilisation of numerous clients together until the framework has deficient execution or bottlenecks. It generally tests ordinary use and outrageous use.

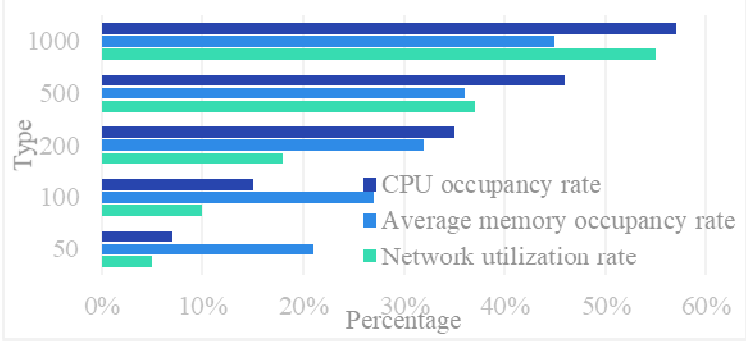
Capabilities: clients utilise different capabilities to guarantee ordinary capabilities.

Figure 6 Integration test results (see online version for colours)



The design is to test whether it is typical for 200 clients to get to all pages of the entire English internet-based independent gaining stage from various districts simultaneously.

Figure 7 Concurrency test results (see online version for colours)



Technique: it utilises anychat to get to the site with high simultaneousness, tests the central processor use rate and memory usage pace of the server during the visit, and examines the activity of the site through the test information. The concurrency test results are shown in Figure 7.

As can be seen from Figure 7, when the number of concurrent clients reaches 1,000, the network utilisation rate of the system increases from 5% to 55%, which has occupied 50% of the network utilisation rate. The average memory usage and CPU usage reached a peak of 45% and 57% on the basis of 1,000 ports. The research work of this paper is implemented on the Moodle platform. It realises the functions of the English autonomous learning platform in terms of function, interface, security, performance, etc., and has been tested in terms of function, performance, etc. The results show that the English online autonomous learning platform meets the design requirements in terms of interface and function, and has strong practicability.

The performance of the proposed mobile intelligent information system is further evaluated by comparing it with traditional education platforms based on non-B/S architectures. Traditional systems typically exhibit lower network utilisation rates and higher resource consumption under similar concurrent user loads. For instance, when handling 1,000 concurrent users, non-B/S systems often experience network utilisation

rates exceeding 70%, significantly higher than the 55% observed in the proposed system. Additionally, traditional platforms frequently require dedicated client installations and maintenance, leading to increased operational complexity and reduced scalability. In contrast, the B/S architecture adopted in this study eliminates the need for client-side software, simplifying deployment and reducing hardware dependencies. The modular design of the proposed system also ensures better resource allocation, as evidenced by the optimised memory and CPU utilisation rates of 45% and 57% respectively. These results demonstrate the efficiency and practicality of the mobile intelligent information system in supporting large-scale English autonomous learning.

4.2.3 Long-term learning behaviour analysis

This longitudinal study adopted a cohort-tracking approach with standardised data collection procedures. The selection of participants followed stratified random sampling across four academic grades to ensure demographic representativeness. Baseline measures recorded initial proficiency scores, previous English learning experience, and digital literacy levels. Data were collected through platform interaction logs that recorded the frequency, duration, and pattern of system access. The analysis phase applied mixed-effects models to account for individual differences while identifying overall trends. Performance indicators were standardised based on baseline measurements to calculate progress indices. Statistical significance was tested using repeated measures analysis of variance and post hoc comparisons.

Table 5 shows that key learning indicators have continued to improve over the past six semesters. User retention and course completion rates have continued to grow, while interaction frequency and knowledge retention are positively correlated with platform usage time.

Table 5 Longitudinal learning behaviour analysis

Metric	*Term 1*	*Term 2*	*Term 3*	*Term 4*	*Term 5*	*Term 6*
Active user retention	72%	75%	78%	81%	83%	85%
Course completion rate	62%	68%	73%	77%	81%	84%
Weekly access frequency	3.2	3.5	3.7	3.8	4.1	4.3
Vocabulary retention	68%	72%	75%	78%	82%	85%
Assignment submission rate	75%	78%	81%	84%	86%	88%

4.3 User feedback analysis

User feedback was collected using a mixed method of quantitative surveys and qualitative interviews. The sample range included active platform users from six different geographical regions. Stratified random sampling was used to ensure demographic representativeness.

Table 6 presents the quantitative results of the platform user satisfaction evaluation. The technical indicators (stability, interface usability) performed best, while the teaching-related dimensions (content quality, learning effect) were slightly lower but still in the positive range.

Table 6 User satisfaction metrics

Evaluation dimension	*Mean score*	*Standard deviation*	*Positive response rate*
Interface usability	4.2	0.3	85%
Content quality	4.1	0.4	83%
Learning effectiveness	4.0	0.5	79%
Technical stability	4.3	0.3	88%
Recommendation willingness	4.0	0.4	81%

5 Conclusions

The times are advancing, and education will never stop. Educational content and methods must keep pace with the times. When such data management covers all aspects of daily life, training should also be achieved through countless educational experts. In addition, event shifting and the use of online self-directed learning phases are also unavoidable. For teachers and students, the organisation is always close at hand, and the education in the self-study room has also become the classroom of the organisation. Indulging technology in information teaching is gradually legalised and becomes an independent learning mode, where students face the learning subject completely. Web-based self-directed learning of English is also at the nexus of this important change, and it is particularly critical in recognising all things are equal. This paper puts forward the idea of network classroom teaching through the comprehensive analysis of modern teaching methods. After understanding the status quo of independent online learning, it made corresponding adjustments according to the actual situation in China, transforming the independent learning mode into the main learning mode for students. Aiming at the current situation of English self-learning, this paper puts forward the suggestion of using the English self-learning platform for secondary development. The English online self-learning platform is redeveloped on the basis of the mobile intelligent information system, and there are still many problems in the realisation of personalisation and compatibility. In the future, the English online learning platform should be further improved to improve the quality of the software.

Declarations

The author declares that she has no conflicts of interest.

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