

# Architecture and Implementation of Dynamic Assessment Software for Internship Teaching Students' Abilities Based on Practical Teaching Feedback

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**Abstract:** In response to the problems of lagging feedback, strong subjectivity, and insufficient process guidance in traditional internship teaching support assessment, this article designs a set of ability dynamic assessment software system based on practical teaching feedback. The system has constructed a three-dimensional assessment system covering teaching design, classroom implementation, and professional development, tracking the process from three dimensions: teaching behavior, language expression, and teaching content. This system focuses on key indicators such as teacher-student interaction, questioning level, language clarity, and knowledge logic. By integrating multiple sources of data such as classroom videos, lesson plan texts, and online behavior, the system achieves continuous analysis and correlation mining of teaching performance, and generates personalized feedback reports containing ability weakness identification, specific improvement suggestions, and growth trajectories. The experiment shows that the system can significantly shorten the feedback cycle, reduce assessment errors by about 65%, and form a closed-loop support mechanism of "collection analysis feedback improvement". In the 12 week teaching practice, the key indicators such as classroom interaction quality and teaching reflection depth of the internship teaching students improved by an average of 1.4-1.7 points, promoting their teaching behavior improvement and continuous development of professional abilities.

**Keywords:** Practical teaching feedback, Internship teaching support for students, Dynamic assessment of abilities, Software architecture, Teaching performance assessment

## 1. Introduction

Teaching practice is an important measure to alleviate the shortage of teachers in remote areas [1]. The quality of teaching reflects whether the teaching process and its effectiveness meet the established requirements [2]. The quantitative assessment of the teaching activities of practice teaching students is helpful to objectively test the teaching effect, verify the achievement degree of goals, provide effective supervision basis for educational management institutions, and then comprehensively improve the practical ability level of normal students [3].

Traditional classroom assessment mostly relies on manual viewing of teaching videos for behavior judgment, which has a large workload and poor feedback timeliness, and it is difficult to achieve normal application [4]. With online teaching becoming an important direction of education development, its quality assessment can not simply apply the index system and methods of traditional classroom [5]. By analyzing the multidimensional factors that affect the teaching quality through educational data mining technology, a more targeted assessment model can be constructed [6].

At present, the assessment practice of teaching practice still faces many challenges. Most assessment methods focus on the result score, and lack of continuous tracking of behavior details such as the frequency of teacher-student interaction, the level of questioning language and the timeliness of feedback in the teaching process [7]. Some studies try to extract teaching feedback information from students' teaching assessment texts, but the recognition of language expression quality, emotional tendency and fine-grained improvement suggestions is still insufficient [8]. The research on teaching support for English and other subjects in rural areas, although focusing on resource coordination, rarely involves the dynamic diagnosis of teaching behavior of teaching students themselves [9]. The existing assessment

system is easily influenced by subjective experience in the setting of index weights, and the quantitative analysis of the dimensions such as the logic of teaching content and the strategies for dealing with important and difficult points is relatively weak [10]. Although some studies have tried to construct an online assessment model by integrating multi-source data, the correlation analysis among classroom behavior, language expression and teaching content is still insufficient [11]. Although some methods integrate the information of teachers, students and teaching environment for feature screening, they fail to effectively establish the process mapping relationship between teaching behavior performance and ability growth [12].

In order to solve the above problems, this article designs a set of dynamic assessment software system for practical teaching feedback. The system constructs a three-dimensional assessment index system covering teaching design, classroom implementation and professional development, and carries out process assessment from three core dimensions: teaching behavior, language expression and teaching content. This system integrates multi-source data such as lesson plans, classroom videos and online behaviors, continuously identifies and analyzes key teaching behaviors, and generates personalized feedback reports, covering short-board diagnosis, improvement suggestions and growth trajectory records. Through the closed-loop mechanism of "data collection-behavior analysis-accurate feedback-practice improvement", it provides timely, objective and operable process guidance for students who practice teaching.

## 2. Method design

The dynamic assessment system of students' ability in teaching practice constructed in this study adopts three-tier design. It focuses on the observable behavior and analyzable content in the teaching practice, forming a closed-loop feedback mechanism. The data acquisition layer regularly obtains three types of core teaching evidence through mobile terminals, network platforms and video recording equipment: teaching plan texts, 1080P classroom recording videos, and online learning platform behavior logs.

As the core of the system, the data analysis layer establishes an assessment framework around three dimensions: teaching behavior, teaching content and teaching organization. The dimension of teaching behavior focuses on the characteristics of language expression and nonverbal behavior. In terms of language, the system recognizes the hierarchy of questions, the pertinence of feedback language and the clarity of explanation language. Non-verbal behavior focuses on quantifiable indicators such as the frequency of teacher-student interaction, the openness of body language, and the structural degree of blackboard writing. The dimension of teaching content focuses on the logic and appropriateness of knowledge presentation. These include the coherence of knowledge point connection, the depth of dealing with important and difficult points, and the degree of life-oriented case selection. The system judges whether the teaching design conforms to the students' cognitive law by analyzing the text of the teaching plan and comparing the video content. The dimension of teaching organization evaluates the rationality of classroom time allocation, the fluency of teaching link transformation and the application of differentiation strategies.

To ensure the objectivity and operability of the assessment, the system processes multi-source data in a structured manner. The teaching plan text extracts indicators such as clarity of teaching objectives and hierarchical activity design through semantic analysis. The classroom video adopts keyframe sampling and behavior encoding techniques to divide the 45 minute course into several teaching segments, and annotate behavioral characteristics such as teacher-student interaction types and student participation status in each segment. Online logs record the depth of students' and teachers' reflections after class, as well as their targeted resource searches and other professional development behaviors. Three types of data are aligned in time series to form a complete chain of evidence from design, implementation to reflection, avoiding the limitations of a single data source.

The assessment results are presented in the form of a diagnostic report, highlighting the corresponding relationship between specific behavioral descriptions and improvement suggestions. For example, when the system recognizes that a student teacher's waiting time for questioning in three consecutive classes is less than 2 seconds, the report will clearly indicate that the average waiting time is 1.3 seconds, which is lower than the 3-second threshold required for effective thinking, and suggest pausing appropriately after key questions to observe student reactions and judge their thinking status. Regarding the dimension of teaching content, if there is a significant deviation between the explanation of knowledge points and the design of lesson plans, the system will prompt that the time allocation deviates from the preset goals by

47%. It is recommended to supplement examples to demonstrate and strengthen understanding.

The visualization layer transforms the analysis results into three types of interfaces adapted to different users: a personal ability radar chart for students and teachers, which intuitively displays the current level and development trajectory of each dimension; A class analysis panel for guiding teachers, used to identify common weak links and adjust the focus of collective training; A regional internship quality dashboard for university administrators to monitor the differences in ability development between different disciplines and teaching support points. All three types of interfaces support backtracking data on a weekly and monthly basis, forming a continuous tracking capability growth profile.

This study abandons the traditional static assessment model that relies on manual observation of lessons, and shifts the focus of assessment from result scoring to process diagnosis through structured collection of evidence from the entire teaching process. The system does not pursue absolute quantification of teaching ability, but focuses on identifying observable and modifiable specific teaching behaviors, so that feedback truly serves the improvement of practical ability. This precise intervention based on behavioral evidence reflects the practical value of assessment in supporting teaching improvement.

### 3. Analysis of teaching practice effectiveness and feedback strategies

To verify the application value of the dynamic assessment system in real teaching scenarios, this study selected 32 internship teaching students from 6 middle schools in the northern and southern Xinjiang regions to conduct a 12 week teaching tracking. The system automatically collects three types of teaching data every two weeks: lesson plan text, 1080P classroom videos, and online platform behavior logs. The system can generate diagnostic reports based on dimensions such as logical teaching design, effective classroom interaction, and clarity of knowledge explanation. Guide teachers to develop personalized improvement plans based on the report, forming a closed-loop feedback mechanism of "data collection behavior diagnosis precise intervention effect tracking".

#### 3.1 Multidimensional enhancement of teaching competence

Table 1 presents the changes in the abilities of intern students in key teaching dimensions. After 12 weeks of continuous feedback intervention, students showed the most significant improvement in the quality of classroom interaction and the depth of teaching reflection. These two abilities are often difficult to quantify in traditional assessments due to their strong subjectivity. The average number of open-ended questions per class for students has increased from 1.2 to 3.8, and the number of effective dialogue rounds between teachers and students has increased by 210%; The proportion of attribution analysis for "student cognitive impairment" in the teaching reflection log has increased from 28% to 76%.

Students from different disciplinary backgrounds exhibited distinct growth trajectories. Science students improved by an average of 1.6 points in the dimension of "instructional logic," primarily reflected in the coherence of knowledge transitions and the hierarchical structure of experimental design. In contrast, humanities students showed a 1.8-point gain in "teacher-student interaction effectiveness," demonstrated by more vivid contextualization and richer follow-up questioning techniques. This indicates that the system can recognize discipline-specific teaching competency requirements, thereby providing a basis for differentiated instructional guidance.

*Table 1 Comparison of Multi-dimensional Competency Assessment Results During Internship (N=32)*

Dimension	Week 2 Mean	SD	Week 12 Mean	SD	Mean Gain	Significance
Instructional Design Logic	3.2	0.42	4.3	0.31	1.1	**
Classroom Interaction Effectiveness	2.8	0.58	4.2	0.37	1.4	***
Clarity of Knowledge Explanation	3.5	0.39	4.4	0.28	0.9	**
Time Management	3.1	0.61	3.9	0.45	0.8	*
Teaching Reflection Depth	2.4	0.55	4.1	0.33	1.7	***
Multimedia Tool Application	3.8	0.44	4.2	0.36	0.4	ns
Emergency Response	2.9	0.67	3.7	0.52	0.8	*

Note: \*p<0.05, \*\*p<0.01, \*\*\*p<0.001; ns = not significant.

### 3.2 Role of precision feedback in improving teaching behaviors

The system has achieved micro recognition and accurate diagnosis of teaching behavior through multimodal data cross validation. For example, video analysis found that a math intern teacher's actual teaching time accounted for 87% of the classroom. The system generates specific improvement suggestions based on this. Two weeks later, the teacher's classroom students' active speaking frequency increased from an average of 3.2 times per class to 8.7 times, and the classroom participation index increased from 2.3 to 3.8.

Based on the diagnostic results, supervising teachers implemented a tiered intervention strategy: for 12 students scoring below 3.0 in "classroom interaction effectiveness," the "3-5-3 questioning method" was mandatorily introduced; for 18 students with insufficient "teaching reflection depth," structured reflection templates were provided to guide them toward analyzing students' cognitive difficulties. As shown in Table 2, The precision intervention group (Group A), which combined system-generated feedback with targeted training, achieved an average improvement of 1.9 points in teaching competence within eight weeks—significantly higher than the 0.8-point gain observed in the traditional empirical guidance group (Group B). Moreover, individual variability within Group A markedly decreased, indicating that the data-driven feedback mechanism effectively reduced the randomness in teaching competence development.

Table 2 Comparison of Teaching Behavior Improvement under Different Intervention Strategies

Intervention Group	N	Baseline	Week 4	Week 8	Gain	Sustained Improvement	Regression
Precision Intervention (System Feedback + Targeted Training)	16	2.6	3.5	4.5	1.9	14	2
Empirical Guidance (Traditional Observation + Comments)	16	2.7	3.2	3.5	0.8	8	5
Control Group (No Intervention)	8	2.5	2.7	2.8	0.3	3	3

Table 3 shows the quantitative changes of three typical behaviors before and after intervention. The system feedback has increased the frequency of behavior and optimized the quality of behavior: for example, "questioning behavior" has shifted from simple repetitive questioning to progressive questioning at the cognitive level.

Table 3 Comparison of Typical Teaching Behaviors before and after Intervention (N=32)

Behavior Type	Pre-intervention	Post-intervention	Quality Improvement Manifestation
Proportion of open-ended questions	22%	68%	Question types shifted from closed ("Yes/No", "What") to cognitively demanding ("Why", "How")
Effective wait time (seconds)	1.8	4.3	Significant increase in students' depth of cognitive processing
Structured blackboard presentation	31%	79%	Transition from linear listing to logically organized framework diagrams
Specificity of immediate feedback	45%	82%	Shift from generic praise ("Good job") to descriptive feedback targeting specific student behaviors

### 3.3 Limitations of system application and directions for optimization

In practical applications, the system has an accuracy rate of 91.2% in recognizing teaching behaviors in theoretical disciplines, but in arts and sports disciplines, the accuracy in recognizing the standardization of body demonstrations is only 78.3%. This is mainly due to the high difficulty of feature extraction for unstructured movements in art and physical education teaching. Subsequently, the behavior recognition rule library will be optimized based on the characteristics of the discipline. The system demonstrates unique value in identifying students' language quality: by analyzing the three sub dimensions of teacher questioning language openness, feedback language specificity, and instruction language clarity, it effectively avoids vague expressions such as "good language expression" in

traditional assessments.

This system continuously collects and analyzes multidimensional teaching behavior data, shifting the focus of assessment from result scoring to process diagnosis, transforming feedback content from general suggestions to actionable instructions, significantly improving the pertinence of teaching reflection and the effectiveness of behavior improvement for intern teachers.

#### 4. Conclusion

Aiming at the problem that the traditional assessment of teaching practice pays more attention to the results than the process, a dynamic assessment system of ability is studied and constructed to promote the teaching assessment from empirical judgment to data-driven process guidance. The system continuously tracks and diagnoses teaching behavior, language expression and teaching content around three dimensions: teaching design, classroom implementation and professional development. The system integrates multi-source data such as lesson plans, classroom videos and online logs to realize normalized analysis. It can accurately identify specific teaching characteristics, such as automatically detecting the proportion of teachers' actual teaching time and giving targeted suggestions, thus reducing subjective deviation and improving the pertinence of guidance.

The 12-week teaching practice shows that the closed loop of "data collection-behavior analysis-accurate feedback-practice improvement" formed by the system can significantly shorten the feedback period. The average score of interns in key dimensions such as classroom interaction and teaching reflection increased by 1.4 to 1.7 points. Through the establishment of personalized growth files, the system supports hierarchical intervention, such as the implementation of "3-5-3 questioning method" for students with weak interaction, which makes the promotion range of the precise intervention group (1.9 points) significantly higher than that of the traditional group (0.8 points).

Follow-up research will enhance the adaptability of the system to different disciplines, and explore a lightweight deployment scheme suitable for remote areas, so as to reduce costs, promote large-scale application, and continue to help improve the quality of teaching.

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