

A Study on College English Precision Teaching Model Based on Micro Lecture and Network Self-study Platform

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Abstract: *The precision teaching is originated from America in the 1960s, applying operant conditioning reflex into human learning and then educational problems. With the rapid development of computer science and information technology, precision teaching attains to its new level of study. The paper firstly elaborates the theoretical analysis of precision teaching from the concept, features and comparison with direct instruction. And then it explores the practice of college English precision teaching including two steps: step one, precision pre-learning through micro lectures and data collection of pre-learning effects supported by information technology; step two, precision classroom teaching plan and practice according to precision analysis and orientation. Three dynamic precision teaching strategies to meet different pre-learning circumstances are creative highlights of the paper; they are Directive Instruction, Group Cooperative Learning, and Individual Exploratory Learning.*

Keywords: *Precision teaching, direct instruction, micro lecture, network self-study platform*

I. Introduction

The precision teaching originated from America in the 1960s, initiated by O. R. Lindsley who applied operant conditioning reflex into human learning. [1] Later, the experimental research turned to applied situation and the scientific products were put into the educational study, establishing the formal project on the basis of the previous research and experiments. However, many behaviorists gave up frequency of response, but instead, adopted percentage correct considered as the traditional measurement pattern in educational evaluation. In general, precision teaching follows three principles [2]: (1) The child knows best, which means the learners know best when we are discussing learners. Precision teachers should assume the students can always respond to the environmental variable appropriately. If the students behave badly, precision teachers are responsible for adjusting variable until the students produce the expected outcomes. (2) Daily measurement of performance. Precision teachers record students' daily performance to make precision teachers and students distinguish and fully apply relevant variables. (3) Self-recording by students and sharing of results among teachers and students. This is an analytical method deriving from experimental behavior. The standard variable chart can help teachers make comparisons with chart among different individuals and various interventions, which is the highly efficient communicative tool between precision teachers and students.

Lindsley, as the initiator of precision teaching, explained that when the science was put on the hands of teachers and students, they would find which process and teaching materials could improve their learning and performance as to each learning individual. In the process of precision teaching, Lindsley stressed the systematic educational assessment and error correction, and he also encouraged the teachers and students to determine precision behavior, record times and length of the behavior, drawing the chart for daily performance for each student and keep trying and trying again. [3]

II. Theoretical Analysis of Precision Teaching in Concept, Features and Comparison

2.1 The conceptual analysis of precision teaching

According to Wikipedia, precision teaching is a precise and systematic method of evaluating instructional tactics and curricula. It is one of the few quantitative analyses of behavior forms of applied behavior analysis. It comes from a very strong quantitative scientific basis and was pioneered by Ogden Lindsley in the 1960s based largely on Skinner's operant conditioning. Precision teaching is a type of programmed instruction that focuses heavily on frequency as its main datum. By focusing on fluency, the teacher can then adjust the curricula for each learner to maximize the learning based on the learner's personal fluency measurements. The instruction can be by any method or approach. For example, the most effective applications of precision teaching have been when it is combined with Direct Instruction. [4] Children as young as five have charted their fluency measurements and utilized precision teaching to increase their learning. According to Owen White [5], precision teaching "has been used successfully to teach the progress of learners ranging from the severely handicapped to university graduate students, from the very young to the very old.

On studying precision teaching, it's necessary to understand the following terms from the professional perspective. The standard celebration chart, created by Lindsley, is the chart with x-axis (an add scale to

accommodate a full school semester) and y-axis (on a multiply scale accommodating frequencies ranging from 1 per day to 1000 per minute). It turns out that this new chart can realize this function that different students being charted by different teachers will have detailed pictures of progress which can be compared and evaluated. The learner knows best, the slogan coined by Lindsley, means that if a student is progressing according to plan, the program is good for the student. If not, the program is flawed, and needs to be changed. As a result, there is no failure by the student as a product of the student, but rather as a product of the teaching. The good or bad performances of the students tend to be determined by the suitable or unsuitable teaching strategy or method.

2.2 The main features of precision teaching

American psychologist B. S. Bloom established Mastery Learning Theory in the 1970s, believing that if given adequate time and proper teaching, nearly all the students can attain the mastery degree for almost all of the learning materials (the general requirement is to attain the mastery degree of 80% or 90% for evaluation items). The precision teaching applies the main concept of mastery learning theory, advocating the judgment of students' learning conditions more correctly and more precisely. Based on this idea, the precision teaching assists teachers in determining teaching decision and realizes precision teaching help through implementing the decision of precision teaching. As a result, the students' learning must have a condition for ending, which is the mastery degree of the knowledge. And that also reflects the characteristics of precision teaching.

Focus on objectives: We classify focus, contrast and polarization as the main methods of positioning in marketing. The positioning theory considers that the sole hope for achieving success is to have selectivity which is to focus on the limited objective and subdivide the market. [6]The revelation gain from precision marketing is that teaching decision and teaching instruction need precision and focus. Under the big data and more advanced technology of learning analysis, precision teachers can obtain students' learning data more conveniently. However, the teachers cannot be deceived by the big data, and they should fully utilize that valuable information on the basis of precision data models to assist positioning of precision teaching so as to render teaching decisions and instructions precise and focused.

Problem solving: At present, the main stream of teaching mode is like this: students finish the studies of some topic or concept in the fixed teaching hours, and if the presupposed teaching hours are over, students are required to turn to the subsequent topic or concept. The main problem for this teaching mode lies in the fact that the student cannot master the basic knowledge, which leads to more problems in the follow-up learning. According to the concept of precision teaching, the key point of teaching is to totally solve the students' problems in each teaching and learning node, helping them accomplish their learning tasks.

2.3 The comprehensive comparison between precision teaching and direct instruction

Direct instruction (DI) is a general term for the explicit teaching of a skill-set using lectures or demonstrations of the material to students. A particular subset of direct instruction refers to a specific example of the approach developed by Siegfried Engelmann and Wesley C. Becker. They advocated that it was of importance to maximize the students' class time, developing "common scenarios" as teaching materials in order to realize teaching objectives effectively and efficiently. DI includes tutorials, participatory laboratory classes, discussion, recitation, seminars, workshops, observation, active learning, practica or internships. DI relies on a systematic curriculum design, delivered by implementation of a prescribed behavioral script. On the premise that all students can learn and all teachers successfully teach if given effective training in specific techniques, teachers may be evaluated based on measurable student learning. The focus of this highly-efficient teaching is to choose or make the appropriate "common scenarios". At present, flipped classroom model generally selects or makes first-class and suitable micro lectures as the main teaching materials for students to preview and this teaching model has a lot of similarity with direct instruction. In our teaching process, the instructors tend to combine precision teaching and direct instruction, taking advantage of different features and methods. According to some recent researches, instructors can utilize DC to fulfill basic teaching tasks, such as the illustration of the concepts, theoretical analysis, and text understanding. On the hand, they can utilize precision teaching to help students to attain the higher teaching objectives, such as the fluency and proficiency of the new knowledge, and the development of critical thinking and creative thinking abilities. So we can come to such a conclusion that DC applies to pre-learning based on micro lectures, and Classroom Teaching based on pre-learning effects belongs to precision teaching. Table 1 illustrates the differences of these two teaching methods from various perspectives, giving us a very clear picture to understand their features and purposes.

	Direct Instruction	Precision Teaching
Time, place and initiator	1964, America, Siegfried Engelmann and Wesley C. Becker.	1960s, America, O. R. Lindsay
purpose	To identify teaching methods that would accelerate the progress of historically disadvantaged elementary school students	To adjust the curricula for each learner to maximize the learning based on the learner's personal fluency measurements
elements	Tutorials, participatory laboratory classes, discussion, recitation, seminars, workshops, observation, active learning, practica or internships	Standard Celeration Chart, percent correct
features	Explicit, systematic instruction based on scripted lesson plans, ability grouping, emphasis on pace and efficiency of instruction, frequent assessment, embedded professional development or coaching	Focus on directly observable behavior, focus on fluency, focus on solving the problem, and focus on accomplishing teaching objectives
Case study	Micro lecture in flipped classroom	Classroom teaching after preview of micro lectures

Table 1: A comparative study between direct instruction and precision teaching

III. Practical Experiment of College English Precision Teaching Model Based on Micro Lectures and Network Self-study Platform

3.1 The 1st step of college English precision teaching: precision pre-learning through micro lectures and data collection of pre-learning effects supported by information technology

College English precision teachers firstly make high-quality college English micro lectures including not only short-term essential lectures with teaching focus and difficult points by means of direct instruction but also the formal tests or exams following each micro lecture. The students fulfill their pre-learning on network self-study platform, watching micro lectures uploaded by English teachers and finishing those matching tests to examine the effects of pre-learning. At the same time, the software for inspecting pre-learning circumstance is applied. How many times do the students watch video? On which point do they stop to watch video again? What are their scores? All these performance can be recorded and collected to be taken as each individual's daily measurement of performance. These recordings are not only the students' learning recordings, but also the first proofs to help precision teachers to prepare for their teaching strategies, teaching plan, and teaching materials. As a matter of fact, if the precision teachers want to give students the first-rate lecture in class, they must analyze all data collected from network self-study platform recording every detail of students' pre-learning. This is the essence of precision teaching which comes from precision pre-learning, precision analysis of pre-learning situations, and precision decision of teaching plan.

In the process of E-learning and educational reform, high-efficiency precision teaching can help teachers and students fulfill the effective recording and intelligent analysis of learning behavior (including learning process and effects). Through the proper division of work of man and machine, we can realize effective and precision knowledge learning. Big data, Cloud Computing, and Internet of Things can be used to analyze different levels of data in regions, classes, learning process and effects. To realize precision orientation by means of a series of models, strategies, and methods under the support of brand-new information technology can help us make precision teaching decision more scientifically, technologically, and convincingly.

3.2 The 2nd step of college English precision teaching: precision classroom teaching plan and practice according to precision analysis and orientation

Precision analysis of pre-learning circumstances and precision orientation is the premise of precision classroom teaching plan which is the focus of precision teaching. According to the frequency of watching micro lectures, we can judge the degrees of difficulties of micro lectures; according to the percent correct, we can judge the degrees of mastery of micro lectures. As a result, our teaching plan should focus on the difficult points with high frequency of errors, skimming those easily-understood points, which can improve teaching efficiency and concentrate on the focus of students' concerns.

Error correction: as to the link of error correction, on one hand, the students do the exercises embedded in micro lectures or finish the comprehensive exam after watching video, which can remind their attentions or check their learning effects. Network self-study platform requires students to return to the beginning of video to learn micro lecture again to do the exercise similar to the previous one in order to help the students really grasp the new knowledge. On the other hand, the students can finish all the other questions relevant to the micro lecture in order to remove all the errors.

Dynamic selection of precision teaching decision: in precision teaching classroom, the selection of teaching strategies is dynamic, which can be directive instruction, group cooperative learning, and individual exploratory learning.

Directive instruction: according to the web-based analysis of pre-learning effects, if more than 80% or 90% of students are confronted with learning difficulties, precision teachers are suitable to adopt the strategy of direct instruction putting emphasis on detailed illustration of new knowledge including concept, principle and reasoning process with some additional questions. This teaching method can maximize lecturing time and make most of students to attain teaching objectives, solving their questions and problems totally and comprehensively. Teachers collect major problems and summarize the structures and levels of new knowledge, which provides the students with a clearer roadmap of learning new knowledge.

Group cooperative learning: if some students (20% to 30%) meet with learning difficulties on pre-learning process, teachers can adopt the strategy of group cooperative learning which encourages the group of students to discuss and explore the main themes and language points of the new text by means of heterogeneity grouping. Through group exploration, the students with learning difficulties find the solution to the problems through group discussion and exploration, and the excellent students find their levels of solving problems improved to a higher degree. After group cooperative learning, the group leaders or representatives will make presentations to express their group learning outcomes, and these communication activities contribute to the improvement of divergent thinking and cooperative learning.

Individual exploratory learning: if a minority of students meet with difficulties, it is necessary to adopt the strategy of individual exploratory learning. Teachers needn't repeat lecturing part in micro lecture, and they need formulate progressive learning tasks for majority of students who can fulfill their respective tasks according to their learning abilities and degrees. For the small part of students with some learning difficulties, teachers can offer face-to-face individual attention to help them grasp basic knowledge and improve their learning skill. This personalized and prevision teaching strategy relies heavily on teaching experience and degree of familiarity for teaching objects. The multi-level teaching tasks designed by attentive teachers can render all the students to improve their abilities in different levels.

IV. Conclusion

Precision teaching, supported and promoted by information technology, provides powerful teaching tool for college English flipped classroom model on the basis of micro lectures and network self-study platform. The students fulfill their pre-learning based on micro lectures, and all of their learning process and effects are recorded and collected by learning platform. By fully utilizing these information recordings, analyzing and exploring these effective digital learning data, precision teachers make precision orientation and realize precision teaching decision. This college English precision teaching on the basis of micro lectures and network self-study platform can take full advantage of classroom teaching and maximize the benefits of college English teaching.

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References

- [1] Lindsley, O. R., & Skinner, B. F. A method for the experimental analysis of the behavior of psychotic patients. *American Psychologist*, (9), 1954, 419-420.
- [2] Lei Yunhe, Zhu Zhiting. Precision Instructional Decision-making based on Data Analysis form Pre-learning. *China Educational Technology*, (6), 2016, 27-35.
- [3] Lindsley, O. R. From Skinner to Precision Teaching. In J.B. Jordan & L. S. Dobbins (Eds.), Let's try doing something else kind of thing. *Arlington, VA: Council on Exceptional Children*, 1972, 1-12.
- [4] Lindsley, O. R.. Precision Teaching's Unique Legacy from B. F. Skinner. *Journal of Behavioral Education*, 1991, 1 (2): 253-266.
- [5] White, O. R.. Precision teaching—Precision learning. *Exceptional Children*, 1986, (52): 522-534.
- [6] Lei Yunhe, Zhu Zhiting. Precision Instructional Decision-making based on Data Analysis form Pre-learning. *China Educational Technology*, (6), 2016, 27-35.