

Study and Practice of Formative Assessment Based on Metacognitive Strategy

Qiaomei Zhao

Xi'an Peihua University

Xi'an, 710125, China

Abstract—Chinese students have long been under the pressure of exam-oriented education. Although summative assessment are highly reliable, it can't help students become self-monitoring, self-motivated and self-improving autonomous learners. At the same time, summative assessment suppresses students' initiative of autonomous learning and innovation. This paper designs formative assessment items guided by metacognitive strategy, including: students' self-monitoring and evaluation, and teachers' evaluation and study efficiency evaluation. Formative assessment pays more attention to caring for students' individual differences, dynamic and diversified development. The purpose is to improve students' metacognitive level, making learners rethink and optimize their own learning process.

Keywords—*Metacognitive; Formative assessment; Individual differences; Rethink*

I. INTRODUCTION

In china, passing examinations has been the ultimate goal of study for a long time. Examination score is considered a single dimension as the ultimate criterion. Summative assessment has high reliability. It has played a positive role in fair selection of talents in China, which has a large population and relative small resources. But the shortcoming of oriented-examination education is obvious, students only focus on learning a large number of knowledge but ignoring the cultivation of ability. And oriented-examination will suppress students' consciousness of innovation, it is difficult for teachers to know the individual differences of students. For example, students' learning motivation, learning attitude, learning methods, the main problems and barriers in learning, the competence of communication and cooperation, the spirit of hardworking, the ability of solving problems. These are the important factors that affect students' lifelong learning and autonomous learning, the important factors that affect students' lifelong development and healthy personality. The purpose of this paper is to study how to cultivate students' metacognitive, autonomous learning ability and improve their learning efficiency through formative assessment.

With the expansion and popularization of higher education, private education has been booming and formed considerable scale. The gaokao exam scores of students in private college students are much lower than that of students in public college. Most of them lack strong basis in study, who are not active in learning, have strong dependence on their teachers, and haven't formed good learning habits and methods. Especially under the influence of exam-oriented education for many years, students in class are used to receiving knowledge passively, lack of active thinking, lack of teacher-student

interaction and communication and lack of participation in class. Little by little, students lose their interests in study and the whole class is short of vigor. Therefore, it is necessary to change summative assessment into formative assessment, which is a new perspective and method to cultivate students' initiative and autonomous learning ability. Although the concept of formative assessment frequently appears in teaching training and teachers' discourse system, a rational understanding of formative assessment and the practice in class is far from being accepted and popularized. The purpose is to provide cases and references. This is the practical significance of this thesis.

II. METACOGNITIVE & FORMATIVE ASSESSMENT

In 1976, this higher-level cognition was given the label metacognition by American developmental psychologist John H. Flavell(American Stanford University) based on the concept of "meta". Since then, the research and practice of metacognition theory have been carried out rapidly all over the world with great influence. A large number of researches show that: if people have a higher level of metacognition, they can monitor and self-regulate their own learning process, and improve the effect of learning. The term metacognition literally means 'beyond cognition', and is used to indicate cognition about cognition, or more informally, thinking about thinking. Flavell defined metacognition as knowledge about cognition and control of cognition[1](1976). Metacognition is classified into three components: Metacognitive knowledge (also called metacognitive awareness) is what individuals know about themselves and others as cognitive processors. Metacognitive regulation is the regulation of cognition and learning experiences through a set of activities that help people control their learning. Metacognitive experiences are those experiences that have something to do with the current, on-going cognitive endeavor[2](1979). Metacognition helps people to perform cognitive tasks more effectively.

The author believes that formative assessment in teaching process is the good way to cultivate students' metacognition and autonomous learning ability. In the process of assessment, learning process is more important than the result, learning ability is more important than scores. In 1930, Ralph Tyler, the founder of modern education assessment, proposed that the key of the assessment is to evaluate the completion of teaching purpose, pay more attention to the process of the teaching implementation, instead of only being used to distinguish and select students. Students' learning process should be evaluated comprehensively, objectively, scientifically, exactly and dynamically, emphasizing on students' self-reflection and

self-improvement in their autonomous learning, and urging teachers to adjust their teaching methods actively.

The author refers to the article of Wang Hua “An applied research review of formative assessment in foreign language

teaching” [3](2006) and combines a large number of teaching practices to summarize the specific differences between formative assessment and summative assessment.

TABLE I THE DIFFERENCES BETWEEN FORMATIVE ASSESSMENT AND SUMMATIVE ASSESSMENT

	Formative assessment	Summative assessment
Purpose	adjust, promote teaching development of teachers and students	distinguish and select students
Time	in the whole process of teaching	after teaching process
Setting	Is closely relative parts in teaching process	test results which are disconnected from teaching process
Emphasis	elements in teaching process: teaching content and methods. Students learning attitude, learning strategies	test scores
Participant	students and teachers	teachers
Result form	multiple written comments, private conversations, scores or grades	test scores (a score or grade)
Effect	diagnosis, dynamic and positive effects	distinctive, selective and static

In 1960s, formative assessment was applied to teaching in foreign countries, and was booming rapidly in 1980s. Chinese scholars began to research in this field in the early twenty-first century. After searching in CNKI, the author found there are 1502 articles about formative assessment in national Chinese periodicals from 2000 to 2018. Although the research in this field are increasing year by year, most of the researches belong to non-material study which are theoretical introduction and discussion, formative assessment’s design principles. There are only 10 papers about the implementation of formative assessment through the perspective of metacognition since 2000 and short of feasible evaluation model. This paper focused on the secondary universities in China (students’ enrollment score is low, their foundation of study is poor and have no good habit of learning and living), designed the relevant formative assessment model, and experimented the feasibility in Xi’an Pei Hua University(a private school in Xi’an). This is the innovation point of my paper.

III. THE PRINCIPLE OF FORMATIVE ASSESSMENT GUIDED BY METACOGNITION

A. Dynamic development principle

The core of formative assessment is “What are you doing now?”, “How to do it? (What kind of method and strategy you will use?)”, formative assessment occurs in every part of the teaching process, which is good for teachers to observe students’ dynamic development process, know students’ weakness well, especial is helpful for students who have difficulty and obstacle in learning[4]. In practice, teachers should pay more attention to students who are weak in study, try not to use uniform criterion. Instead of comparisons with top students, teachers should compare these students’ present progress with their past performance. Through the process of dynamic development, it is beneficial for teachers to find their problems in teaching, rethink their teaching content, quality, methods and adjust their own teaching methods. What’s more, it is beneficial for students to adjust their learning methods, attitude and learning habit. In the whole formative assessment, the process of gaining knowledge and solving problems is much more important than results.

B. Multiple evaluation principle

Howard Gardner, a psychologist in Harvard University proposed multi-intelligence theory. He proposed that each person’s intelligence is a combination of 10 interconnected but independent abilities. According to the theory of multi-intelligence, every student will have their own advantage type of intelligence and their weak intelligence. So the methods of assessment should be innovated, the purpose is to discover and motivate students’ advantages and potentials, caring about their differences, so as to facilitate students to know themselves better, increase their self-confidence and make them get great progress.

C. Encouraging principle

It is important for teachers to ensure the formative assessment item objectivity and fairness. In teaching process, some teachers often praise students blindly whatever they do. It is difficult for students to know their shortcoming, of course students can’t rethink and improve themselves. So teachers should encourage students based on their true performance. And encouraging principle should include criticism, let students know their shortcomings and weaknesses is good for their awakening and progress. So the formative assessment items’ objectivity and equality is the premise of encouraging principle.

D. Subjectivity principle

Students should participate in the whole process of formative assessment, students are not only the assessed but also the assessors, which is the obvious difference from the summative assessment. The formative assessment will include: teachers’ assessment for students, self-assessment by students, students’ assessment each other and students’ assessment for teachers’ teaching process. So the subjectivity principle is helpful both students and teachers to rethink their learning and teaching process and regulate their strategy. It is a good way to motivate students and teachers’ initiative and cultivate the ability of rethinking themselves.

IV. THE EXPERIMENT OF FORMATIVE ASSESSMENT IN PRIVATE COLLEGE IN CHINA

The experiment of formative assessment in private college in China

A. Object of Study

The experiment is organized and implemented in Xi'an Peihua University. In 2017 76 teachers in the whole school took part in the formative assessment innovation attempt, in 2018 one-third teachers in school took part in formative assessment experiment.

B. Research Method

Writing teaching notes after class, the content should include two parts: one part is the main contents of the class, the key and difficult points, gains, faults and rethinks; Another part will include the real record of typical students, for example "today ×××(student's name) played smart phone in class, after class talked with the student, the student said he was weak in English, he was lack of interest and confidence.", "today ×××(student's name) didn't finish his homework, after class

talked with the student, she said she couldn't do the homework because she couldn't understand the contents of last class." and so on. Through writing teaching notes, teachers can rethink the gains and faults in their teaching consciously. What's more, formative assessment is a dynamic evaluation, the propose is to motivate each student to surpass and break through themselves, especially it is a good way to cultivate students' metacognitive competence.

Formative assessment will include three parts: students' self-monitor and assessment (make study plan, write learning notes, rethink their study); teacher's assessment (homework correcting, class activity and performance, tests, reading reports); learning effect assessment (students' self-assessment, peer assessment, teacher's assessment).

V. CASE ANALYSIS

Take the School of Foreign Language and Culture where the author works for example, the items of college English formative assessment are shown in the following.

TABLE II THE ITEMS OF COLLEGE ENGLISH FORMATIVE ASSESSMENT

Class attendance (10%)	Class notes (10%)	Homework 20%					Group cooperation and discussion 20%				Oral test (10%)	Listening Test (10%)	Autonomic learning (10%)	Total score (110%)
		1	2	3	4	5	total score	1	2	3	total score			

(10 scores in the second class are additional points)

Item 1: class attendance (20 scores), checking-in at least 10 times a term; Item 2: class notes (10 scores), refers to take notes in class and learning, many students only listen in class instead of taking notes. During one semester, students feel they have learned nothing. Therefore it is important to have a good habit of taking notes; Item 3: homework (20 scores), includes exercises after class, writing, translation, reading reports and so on. There are five assignments in the whole semester; Item 4: group cooperation and discussion (20 scores), teachers can design activities of group cooperation according to teaching contents, combine independent learning with group activities. Take one reading text in comprehensive course of college English as an example, the title of the reading comprehension is "Urbanization", which is about the social problem caused by the urbanization process, teachers can let students cooperate to make PPT, search the top ten happiness cities in China, the top 10 richness cities in the world, and explain the reasons. Or make students discuss the advantages and disadvantages of urbanization in your hometown. Item 5: oral tests (10 scores), two oral tests in a term, ten topics will be given to students, students can choose one of them, 5 minutes for preparation, then communicate with teachers about the topic they choose. Students can express their viewpoint clearly and make reasonable argument; Item 6: listening tests (10 scores), two listening tests in a term. Item 7: autonomic learning (15 scores), students will practice their listening, speaking, reading and writing on-line in autonomic classroom, every students' on-line learning time is no less than 15 hours (every students' on-line learning time is recorded by computer and fed back to teachers in time). Item 8: the second class (10 scores), refers to take part in school's English contests and win a prize. For example,

English speaking contest, English opera contest, English reading and writing contest and so on. It is additional scores, only a few excellent students will gain scores in this item.

For another example, if teaching students whose major is English, the requirement of formative assessment will be higher, teachers can design recitation and retelling texts. In this way students can learn a lot of idioms and sentence patterns effectively, in their process of imitation learners are able to output foreign language more fluently and naturally; Or dictation of words, vocabulary and sentences, in this way students can master the spelling of English words which is an important basis. In the teaching activities, it is found that many students do not pass the spelling of words, less than one or two letters or more than one or two letters is common. So the design of the project can help students lay a solid foundation in language; There is a theme in each unit, for example, how to protect wildlife animals, protect environment, etc. So students can write articles according to different themes. In addition, we should combine autonomic learning and cooperative learning, such as brain-storming, autonomic reading, communication between teachers and students, building up QQ group or WeChat group online. In a word, different disciplines should design their own reasonable, scientific and feasible formative assessment items according to their own features.

VI. THE RESULT OF THE EXPERIMENT

The formative assessment has implemented for one year, combining online student assessment and interview, the author finds: both teachers and students are influenced by formative assessment positively. The specific performances are the follows:

A. Teachers

Formative assessment can motivate teachers to improve their teaching ability actively. Firstly, the number of people using multi-media is much higher than before the formative assessment. Before experiment, the number of people using multi-media is only 25%. After one year's experiment, about 80% of teachers use multi-media, and prepare their lessons more sufficiently. Secondly, by writing teaching notes and students' feedback information, teachers can realize their shortcomings, and rethink on how to improve their teaching level and their professional level. In this way, teachers can have a sense of crisis awareness and enterprising spirit. Thirdly, teachers will not repeat what the book says in class, they can regulate their teaching contents according to students' actual level. And the teaching contents are not confined to the textbooks, students' extracurricular reading, reading notes and writing will be infused into teaching contents, especially teachers can select the latest cases into class, focus on hot spots of society, increase the amount of information in every class. In this way, teachers improve their professional level quickly.

B. Students

Firstly, before formative assessment, students are slack and unstructured, ask teachers to scope test coverage and remember standard answers before examination. Through the implementation of formative assessment, students' learning attitude has changed greatly; Secondly, students begin to rethink their shortcoming consciously through self-assessment and feedback, they try to improve their learning method and realize that the ability to analyze and solve problems is much important than the acquisition of knowledge, strive to develop good learning and living habits; Thirdly, students implement their learning tasks and activities more actively. They build up learning groups. In group cooperation, students can consult with each other and share resources. In this way, their sense of cooperation improved greatly. Fourthly, students consciously combine the textbooks with extracurricular reading. No longer achieve high scores by rote learning, no longer blindly accept knowledge, can they think actively, pay more attention to the process of analyzing and solving problems rather than just getting answers. In a word, through formative assessment, students' autonomic learning and metracognitive competence improved rapidly, especially the ability of self-reflection and self-regulation.

C. Interview

The author interviewed with some students and tried to know their feedback.

S1: Though the group activity I learned much knowledge that I couldn't learn from textbook. In the past I ignored the communication with others. I had thought that learning is everyone's business. Now I am aware that cooperation and resource sharing are really very important.

S2: I learned the significance of cooperation. In the past I feared to open my mouth to speak English. Through a term of study, especially taking part in English Corner and performing English play, I find to speak English is not very difficult. Now I can communicate with others in English and I know my classmates better than before.

S3: In formative assessment, teachers asked us to watch some English films and discuss with others, such as "Bicentennial Man", "Jurassic Park" and "Harry Potter" in English. Since we watched these films in our extracurricular time, I understood the textbook better. I can understand the differences of value system between China and the English-speaking countries. For example, in some western countries, people like adventure, they advocate individualism, considering individual as the center of the world. So they focus on striving by themselves, enjoying their private life. However, Chinese pay more attention to collectivism. It is a concept and it influences people's behavior and thinking patterns.

VII. CONCLUSION

On one hand, formative assessment has been implemented for a year, students and teachers have changed positively, whatever their learning and teaching attitude or metracognitive competence. On the other hand, there are still some limitations, for example, some items in formative assessment are difficult to measure, subjectivity and arbitrariness are difficult to be avoided. And whether the formative assessment items are scientific is uncertain. In addition, too many and too trivial assessment items cause psychological pressure on students. All of these problems are going to be improved in the following formative assessment innovation.

REFERENCES

- [1] Flavell, J. H. "Metacognitive aspects of problem solving"[J], In L. B. Resnick (Ed.), *The nature of intelligence*, 1976, pp. 231-236.
- [2] Flavell, J. H. "Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry". *American Psychologist*, v34 n10, 1979, pp.906-11.
- [3] Wang Hua, Fu Changhong, "An applied research review of formative assessment in foreign language teaching"[J]. *Foreign Language World*, 2006,(4), pp. 67. (In Chinese)
- [4] Xiao Wuyun, "Metracognitive & Foreign Language Study"[M], Shanghai: Shanghai Jiao Tong Press, 2011, pp. 51-56. (In Chinese)