

RESEARCH ON STRATEGIES TO IMPROVE STUDENTS' SELF-EFFICACY IN MATHEMATICS LEARNING

Yuanyuan Li¹ & Linan Zhong^{1*}

Department of Mathematics, College of Science, Yanbian University, Yanji 133002, CHINA

* Corresponding author: Linan Zhong, E-mail:lnzhong@ybu.edu.cn

ABSTRACT

In the teaching process, the “active” Classroom atmosphere is a stimulant for a class. The implementation of the teaching link is also inseparable from the help of the atmosphere, but in the current classroom, the phenomenon of "Silence" can be seen everywhere. From the perspective of self-efficacy, the reason for silence in class is closely related to the lack of self-efficacy. Improving students' self-efficacy plays an important role in students' development, teachers' teaching and the improvement of overall education quality.

Keywords: Classroom silence; self-efficacy; mathematics learning.

Statement of Problem

In our current classroom, there will be classroom silence for various reasons. The phenomenon of classroom silence is very detrimental to students' learning, and it is also detrimental to the implementation of teaching. So why do students stay silent in class? From the analysis of Bandura's self-efficacy theory, it can be found that most students keep silent in class because of fear of wrong, fear of being criticized, think you cannot do it. This points to the problem of insufficient self-efficacy of students. Therefore, in the education teaching process, improve the self-efficacy is worthy of our attention.

Definition of Self-Efficacy

In Bandura's Self-efficacy theory, the definition of self-efficacy refers to "people's confidence in whether they can use their skills to complete a certain work behavior". After this concept was put forward, a great deal of research began in the fields of psychology, sociology, and organizational behavior. Bandura believes that due to certain differences between the fields, there is a certain difference in all aspects of literacy required. A person's sense of self-efficacy is different in different fields. Therefore, the general sense of self-efficacy does not exist. Whenever we talk about self-efficacy, it refers to the sense of self-efficacy related to a specific field.¹This paper defines self-efficacy in mathematics learning as the degree of confidence that people can use their existing knowledge, skills and experience to solve a mathematical problem.

Questions About Self-Efficacy in Mathematics Learning

(1) Students' emotions are negative. In the process of learning, students will inevitably encounter confusion, and then have a certain sense of frustration. A large number of students are reluctant to ask others for advice, or put them aside for other reasons, so the accumulated problems will be more and more, less and less confident, gradually immersed in the negative emotions, and the sense of self-efficacy will be lower and lower.

¹ [Zhang Dingkun, Fang Liluo, Ling Wengen. Theory and research status of self-efficacy [J]. Psychological Dynamics, 1999 (01): 39-43 + 11.]

(2) The lack of effective persuasion.² Studies have shown that when students face difficulties, most teachers fail to give them timely and effective persuasion to student, weakening their motivation to learn, affecting students' attitudes and behaviors in facing difficulties, and reducing their sense of belief. That is to say, it reduces students' sense of self-efficacy.

(3) Educational objectives is not clear. Due to the pressure of further education, some teachers will use "test score" and "student promotion rate" as the main teaching tasks, while ignoring the development of students' mental health. Students with low self-efficacy have not been concerned by teachers. After shelving, the accumulation becomes more and more serious, even leading to the initiative to give up and start decadent. This issue is not to be underestimated. Our educational task should not only be used to impart knowledge and solve confusion, but also to educate people. Students' self-efficacy affects the growth of students. The improvement of self-efficacy helps to improve the phenomenon of classroom silence. The students' anxiety will also be reduced, and their performance will naturally be improved.

(4) The teaching model is single and lacks the formation of habits. In today's mathematics teaching, the majority of students still adopt the mode of explanation and communication, the mode of guidance and discovery, the mode of self-study guidance the mode of activity participation and the mode of discussion and communication are not widely used, and students do not develop good learning habits and have poor ability of regulation. Some students will obey the teacher's arrangement in the classroom, and study after class with the goal of completing homework. Lack of the desire to explore knowledge, the initiative of self-study, and the consciousness of actively trying to do experiments and build models.

Strategies to Improve Students' Self-Efficacy

(1) Teaching objectives should be feasible. When setting teaching objectives, teachers should analyze the learning situation in advance and set teaching objectives according to the situation of students. Teaching goals should be what students can achieve after a class, not far away. The teaching goal should be suitable for students. If it is too difficult, it will make students feel powerless and reduce their self-efficacy; if it is too simple, it will not be conducive to the improvement of students' ability, and students' attention will be easily distracted, resulting in poor teaching quality. Teaching objectives should be multidimensional. For example, when learning "power function", emphasis should be placed on images and properties. When learning exponential function and logarithm function, it is also important to learn inverse function while learning basic graph and properties. The teaching goal set in this way is to promote students' self-efficacy.

(2) Make full use of the demonstration role. In Bandura's theory of self-efficacy, it is pointed out that the factors that influence the formation of self-efficacy include the success or failure of an individual's own behavior, vicarious experiences or imitation, verbal persuasion, emotional arousal, and situation conditions. Among them, "vicarious experiences or imitation" is actually: many of human performance expectations are derived from observing the vicarious experiences of others. A key point here is the consistency of the observer and the role model, that is, the situation of the role model is very similar to the observer. In the process of teaching, teachers can choose students with similar cognitive level to answer questions, or do questions, and give praise. This way can encourage other students to refer to it. Students see that they are similar to their own, or they are not as good as their own students can do, they will think they can also. Thus, they will improve their sense of self-efficacy and gradually start to speak up and do things they dare not do.

(3) Conduct the necessary attribution training. The so-called attribution training is individual

² niu yuxia. Cultivation of self-efficacy in high school students' whole book reading learning [D]. Liaoning normal university, 2019.

causal cognition about the behavior exist some attribution bias, through attribution training, individuals can obtain the feedback information of various forms of attribution, then eliminate the deviation, form the positive emotions and expectations, is to enhance achievement motivation, correct inferiority mentality, the effective ways and methods to promote the development of students' physical and mental health. Through attribution training, if the reason for students to complete something is attributed to their own ability, this conforms to Bandura's theory of self-efficacy, which is conducive to enhancing students' self-efficacy.

(4) Create the right environment. Engels said that "people create the environment, and the environment also creates people".³To build right environment, we should pay attention to the following points: ① Establish a harmonious and equal relationship between teachers and students. Harmonious and equal teacher-student relationship can facilitate students to communicate with teachers, avoid the fear caused by too much authority. At the same time, such teacher-student relationship is conducive to teachers' education, teaching and feedback information. ② Democratic and open classroom. The classroom is the prime time for students to concentrate, and the democratic classroom can effectively find students' problems, and correct them in time, to promote students' acquisition of knowledge and skills. ③ Positive and healthy class collective. Class collective is a powerful force of education, which makes "collective drive individual, individual achievement collective".

(5) Education in appreciation and love. The so-called appreciation of love education is to appreciate education and love education. Appreciation education is to discover the advantages of students and appreciate the advantages of students. Caring education means caring for students, using the love of teachers to gain students' trust, and encouraging students to be positive. Students' sense of self-efficacy needs emotional arousal. When students are faced with something, students' physical and mental reactions and intense emotions affect students' sense of self-efficacy. By loving appreciation education teachers, it allows students to learn mathematics is not exclusion, disgust, and even some interest when such emotions will help improve self-efficacy. Therefore, when getting along with students, teachers should be good at appreciating the advantages of students, more care for students.

CONCLUSION

People with a high sense of self-efficacy are stable in situations and willing to face challenges. They can effectively adjust themselves and give full play to their personal wisdom and skills. In the teaching process, we should strengthen the emphasis on students' self-efficacy, improve students' self-confidence, and establish a vivid classroom to make students love learning.

REFERENCES

- [1] zhuang yonghua. Cultivating students' self-efficacy and changing passive learning into active learning [J]. China off-campus education, 2010 (S1) : 229.
- [2] Zhang Xing. Research on the relationship among classroom silence, self-efficacy and anxiety of junior middle school students [D]. Mudanjiang Teachers College, 2019.
- [3] gu hongxia. On the cultivation of students' self-efficacy [J]. China off-campus education, 2012 (17) : 8 + 27.
- [4] Jiang Kaizhen. On the cultivation of students' sense of self-efficacy [J]. Reading and writing (Journal of Education and Teaching), 2012, 9 (05): 19 + 22 + 4.

³"Marx and Engels Collection" Volume 1, People's Publishing House, p. 243

- [5] ge hui. Strategies for improving students' self-efficacy [J]. *Art education research*, 2012 (16) : 123.
- [6] yuan jing. Creating effective English teaching classes to stimulate students' learning motivation -- cooperative learning based on cultivating students' self-efficacy [J]. *Jiangsu education research*, 2013 (21) : 53-55.
- [7] zhang wei. Research on the correlation between junior three students' self-efficacy and mathematics academic performance [J]. *Journal of nanchang institute of education*, 2013,28 (03) : 109-110.
- [8] shi dongpo. Discussion on how to cultivate students' self-efficacy [J]. *Science and education guide (the first ten-day issue)*, 2014 (01) : 213-214.
- [9] liu jinyu. Discussion on the improvement of self-efficacy of students with learning difficulties [J]. *China electric power education*, 2010 (24) : 171-173.
- [10] bai xiaoyun. Improving students' self-efficacy and arousing their enthusiasm for learning [J]. *Popular literature and art (theory)*, 2009 (11) : 181
- [11] Zhang Dingkun, Fang Liluo, Ling Wenzhen. Theory and research status of self-efficacy [J]. *Psychological Dynamics*, 1999 (01): 39-43 + 11.
- [12] Li Jie. A study on the relationship between academic self-efficacy, teacher self-support and academic procrastination of elementary school senior students [D]. Harbin Normal University, 2019.
- [13] Niu Yuxia. Research on the cultivation of self-efficacy in reading and reading for high school students [D]. Liaoning Normal University, 2019.
- [14] Shi Xiaohong, Xu Shijun, Xiao Hongbo, Jia Xinjuan, Lv Mao. Teaching strategies to enhance students 'self-efficacy [J]. *Journal of Weinan Teachers College*, 2015, 30 (08): 35-38 + 52.
- [15] Wang Xueqin. On the cultivation of self-efficacy of science and engineering students [J]. *Journal of Jixi University*, 2011,11 (10): 35-36.
- [16] Yu Jing. Research on the influence of different forms of school physical activity on self-efficacy of junior high school students [D]. Hebei Normal University, 2019.
- [17] Cai Hongjuan. Research on Strategies for Improving Students' Self-efficacy in Physics Teaching [D]. Nanjing Normal University, 2017.