The Influence of Innovative Teaching Effectiveness and Self-Regulated Learning Strategies on Music Learning Outcomes

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Abstract

Music is a common language in the world and an important way to cultivate people's sentiments. For art college students, teachers' teaching methods and students' learning strategies are likely to improve the effectiveness of music learning. For cultivating art college students' good personal character, aesthetic ability is of great significance and has a profound impact on the overall development of students. In order to improve the effectiveness of teaching, teachers need to innovate the content and form of music teaching, design from the aspects of students' learning reality and interest cultivation, enrich students' learning experience, and improve students' learning strategies and methods.

Taking cognitive development theory as the breakthrough point, this paper examines the influence of teachers' innovative teaching effectiveness and self-regulated learning strategies on music learning outcomes and discusses the moderating role of self-regulated learning strategies. A questionnaire survey method was used to investigate the students of two art colleges, and a total of 619 valid questionnaires were finally obtained. The statistical results supported the research hypotheses by using confirmatory factor analysis, multiple regression analysis, and moderating models. The research results show that innovative teaching effectiveness and self-regulated learning strategies have a significant positive effect on music learning outcomes; self-regulated learning strategies moderate the effect of innovative teaching effectiveness on music learning outcomes. The higher the self-regulated learning strategies, the stronger the positive effect of innovative teaching effectiveness on music learning outcomes.

Keywords: Innovative teaching effectiveness; Self-regulated learning strategies; Music learning outcomes

Introduction

Being at the front line of teaching, teachers should not only possess sufficient professional competence, but also pay attention to the individual differences of students to meet the learning needs of all students (Belyaeva et al., 2019). Innovative teaching is synonymous with educational renewal and performance responsibility. The American futurist Harkins (2008) puts forward the concept of education 4.0, stating that education 1.0 belongs to memory experience, education 2.0 is based on the Internet, education 3.0 is knowledge generation education, and the era of education 4.0 is education with innovation output as the core. Miranda et al. (2021) point out that the education 4.0 generation must be the era of technology and innovation. To achieve the function of talent cultivation and drive technology and innovation, the basic power still comes from school educators, especially teachers play a key role in it, as the acquisition of students' technological literacy and innovation ability depends on teachers' teaching. Therefore, in the context of education 4.0, it is very important that teachers have the professional quality and innovation ability.

Self-regulated learning is a concept first proposed by Bandura in 1977. In addition to emphasizing the impact of cognitive factors expected by personal efficacy on behavioral motivation, it also proposes active goal building, self-evaluation, and self-enhancement. The motivation to establish and maintain behavior is necessary(Zimmerman & Schunk, 2011), that is, if students think that the goal is valuable, it can stimulate personal motivation to pursue it, and evaluate whether the goal is achieved according to self-defined standards. Risemberg and Zimmerman (1992) believe that self-regulated learning is a learning process and response in which students effectively set goals for themselves, use strategies to achieve their goals, and pay close attention to their learning outcomes. In order to graduate successfully or acquire superb performance skills, they need to be proficient in learning to achieve their goals. Costa et al. (2018) find in a follow-up study that college students will use twelve self-regulated learning strategies in four kinds of learning tasks, such as listening to lectures, writing assignments or reports, reading textbooks, and preparing for exams. There are four types of self-regulated learning strategies, including motivational strategies, information processing strategies, metacognitive strategies, and

action control strategies. Therefore, the researchers want to investigate whether the self-regulated learning strategies used by music teachers and students in academic subjects affected learning outcomes.

The effect of innovative teaching is to cultivate students' creativity. The open teaching mode includes improving students' thinking skills, stimulating students' creativity, and enhancing students' learning outcomes (Chowdhury et al., 2019). Therefore, Innovative teaching has become an important factor in exploring education. If teachers can use an open teaching method, cooperate with the implementation of the curriculum, create innovative teaching situations, provide opportunities for students to think proactively, increase students' learning behaviors, and give students feedback and affirmation in a timely manner, it will be possible to improve the performance of students' learning outcomes (Brandt et al., 2019), learning strategy is a goal-oriented learning process, which is not only the explicit behavior shown by the learner, but also must go through the internal thinking and psychological operation process of the learner, and the use of it is sequential and systematic. Comprehensive performance with organization can perform learning tasks (Shin & Kang, 2019). In the process, it can promote learners' learning effectiveness and generate organized thoughts or behaviors to achieve learning goals (Winne, 2022).

At this stage, there are many discussions about cooperative learning, but the specific application exploration in music teaching is not enough. Therefore, relying on the existing research basis of cooperative learning, the author explores the influence of teachers' teaching innovation and teachers' professional quality on cooperative learning, and the moderating effect of teachers' professional quality on the effectiveness of teaching innovation and self-regulated learning strategies. The new teaching model from the teacher level to the student level has made some contributions to music teaching.

Research Objectives

In summary, this paper proposes the following research objectives:

1: To explore the relationship between innovative teaching effectiveness and music learning outcomes.

2: To explore the relationship between self-regulated learning strategies and music learning outcomes.

3: To explore the moderating effect of self-regulated learning strategies.

Literature Review

The Relationship Between Innovative Teaching Effectiveness and Music Learning Outcomes

Teachers have a profound impact on students' learning outcomes, and perhaps just one sentence can help students develop their effectiveness. According to Burnard (2007), students with high creative self-efficacy will respond to teachers' feedback on creativity, that is, whether the teacher can tell students that they are very creative promptly, so as to enhance students' confidence and learning effectiveness. Moreover, Kivunja (2014) explain the learning effectiveness from the perspective of system theory, emphasizing that the occurrence of learning effectiveness is the result of the interaction of three sub-systems, namely individual, field, and discipline, and believes that if schools and teachers can encourage and support students' learning, students will have better learning performance.

According to Hennessey (2003) explaining the environment and student performance with the social psychology of learning effectiveness, teachers play a key role in the process of improving student effectiveness (Csikszentmihalyi & Wolfe, 2000). However, if schools and teachers fail to support the performance of students' learning outcomes, it will result in deteriorating students' learning outcomes. Lee et al. (2011) point out that school education does not help much or even hinder it. The school emphasizes high logic but reduces creativity with age. Therefore, the environment is an important pillar of learning effectiveness. Even if a person already has the internal resources of creative thinking, if the environment is lacking and the appropriate support is not available, the learning effectiveness can not be presented.

Susanto et al. (2020) argue that teachers must evaluate creativity for their students, and emulate it when it is strange, odd or different, and instruct it openly in the classroom, so that it becomes an important learning element for students. It also means that when students have special and distinctive creative expressions in the classroom, teachers should be able to record them imitating these creative expressions, and guide them in a supportive and open way, give them appropriate assessment, so that students can gain important learning experiences.

Many scholars believe that school is the most important learning environment for students, which can cultivate and support the development of students' learning effectiveness, and the teaching methods in the classroom have the most direct impact on students. They point out that creative teaching is based on cultivating students' learning effectiveness. Teaching methods, with

an open teaching mode, including teaching of creative thinking skills, stimulating students' creativity, and helping students to create behaviors (Button, 2010; Edward et al., 2018), so creativity teaching becomes an important factor in the discussion of learning effectiveness education.

The combination of creative teaching situations and open-ended approach to teaching helps to stimulate students' imagination and creative talents, it will improve their learning outcomes when they demonstrate their unique and innovative behaviour in practice and receive more positive feedback. (Burnard, 2007; Millar & Dahl, 2011; Zhao et al., 2021), that is, teachers' creative teaching methods such as improving creativity intention and increasing creativity skills, contribute to enhance student learning outcomes.

In summary, the following research hypothesis is put forward:

H1: Innovative teaching effectiveness has a positive impact on students' music learning outcomes

The Moderating of Teacher Professionalism

Self-regulated learning refers to the behavior process in which learners actively manipulate action strategies, motivation, and metacognition, so as to give personal behavioral direction and achieve learning goals in the learning process of dealing with specific situations (Vladimirovich et al., 2020). Self-regulated learning is mainly based on social learning theory, which proposes that individual learning is the result of the interaction with individual, environment, and behavior, and then affects learners' self-regulated learning, in other words, the learning process under the influence of learners' self-enhancement, self-teaching, self-efficacy, and self-assessment has an impact on learning outcomes (Barni et al., 2019; Mustafa et al., 2019; Vladimirovich et al., 2020).

Kim and Kim (2021) believe that self-regulation will be adjusted according to personal observation or external experience, because individuals can direct themselves, control and guide their actions, thoughts, and emotions through the results. When individuals carry out learning activities, in addition to self-awareness, they are also affected by the learning environment, and their learning behaviors are different. Zelenak (2020) responds to the interaction of individual (self), environment, and behavior, in his view, the learning effectiveness is affected by the individual's self-regulated efforts, environmental adjustments, and behavioral outcomes, and the interaction of feedback leads to a model of self-learning and adaptive learning. Bandura's learning process is divided into three processes: self-observation, judicial process and self-response. Self-

observation means that individuals are aware of their behavior, perceive their behavior performance, set self-goals, and evaluate the resources needed, which is an important basis for self-adjustment and learning. Judicial process means that individuals can judge their current performance according to the judging criteria. The judging criteria can be set by themselves or refer to other people's behavior and social norms. Self-response refers to the behavioral response made after the observation and judgment of personal behavior.

Self-regulated learning is the behavior of learners in terms of personal motivation, cognitive patterns, and behavioral patterns to achieve learning goals, including cognitive initiative, self-control, and goal orientation (Wong et al., 2019; Albelbisi & Yusop, 2019; Carter Jr et al., 2020). Anthonysamy et al. (2020) argue that self-regulated learning is a planned and continuous cycle mode. Yan (2020) proposes the "Self-Regulatory Cycle", which is divided into four processes: self-evaluation and monitoring, goal setting and strategy planning, strategy implementation and monitoring, and strategy outcome monitoring.

In summary, the following research hypotheses are put forward:

H2: Students' self-regulated learning strategies have a positive impact on music learning outcomes

H3: Students' self-regulated learning strategies can promote the positive relationship between teachers' innovative teaching effectiveness and students' music learning outcomes

Conceptual Framework

This research is a research study. The researcher defines the research conceptual framework based on the theory of cognitive development theory together with examines the influence of teachers' innovative teaching effectiveness and self-regulated learning strategies on music learning outcomes, and discusses the moderating role of self-regulated learning strategies. The details are as follows.

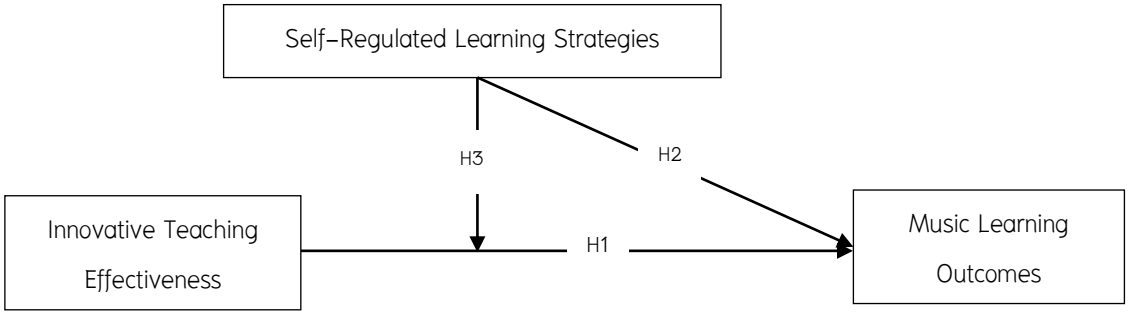

Fig.1 Conceptual Framework

Research Methodology

Research Object

This study is a sample questionnaire survey that does not need to collect all purpose samples, to the extent, using the formula proposed by Dillmann (2000):

$$N_s = \frac{(N_p)(p)(1-p)}{(N_p-1)(B/C)^2+(P)(1-P)}$$

Among them, Ns is the number of samples to be completed; N_p is the parent group size; (p) (1–p) is the parent group heterogeneity; B is the tolerable sampling error, usually 0.05 (positive and negative 5%); C is the tolerance trust interval (confidence level), usually 1.960 (the Z score corresponding to 95% of the acceptable trust interval). Therefore, the minimum sample number is $N_s \approx 612$. When the Ns is at least of 612, the sampling error is ± 5% and the credibility is 95%.

In this study, students from two general art colleges in Jiangxi Province were selected as the research objects. A total of 647 questionnaires were distributed and 619 were recovered, with a recovery rate of 95.67%. Excluding the subjects with incomplete information reporting on demographic variables, regular answers, and missing values exceeding 5%, a total of 585 valid questionnaires were obtained, with an effective rate of 94.50%. Among them, there are 143 male students, accounting for 24.44%, 451 female students, accounting for 77.09%; 249 urban students, accounting for 42.56%, and 336 rural students, accounting for 57.44%; the average age of students is 19.57–21.73 years old.

Research Tools

1. Innovative teaching effectiveness: Using the scale of Zhu et al. (2013) creativity teaching scale. The scale is divided into two aspects, including enhancing creativity intention and enhancing creativity skills, with a total of 14 items. The operational type of innovative teaching in

this study is defined as "teachers think through the essence of creativity, cooperate with the implementation of courses and the use of creative thinking strategies, enhance students' creative intentions and cultivate students' creative thinking skills, so as to stimulate students' creativity and promote the development of students' creativity". The measurement method adopts a five-point Likert scale, and the higher the score, the better the teacher's creative teaching method, which can explain 65.62% of the overall variance, and the factor load of each item is between 0.76–0.84, the alpha coefficient is 0.82.

2. Self-regulated learning strategies: Using the scale of Costa et al. (2018), a total of 24 measurement items, including the three dimensions of "cognition", "motivation" and "action", the components with eigenvalues greater than 3 are extracted by factor analysis, which can explain 71.28% of the overall variance, the factor load of each item is between 0.75–0.84, and the alpha coefficient is 0.89.

3. Music learning outcomes: Using the scale of Özmentes and Gürgen (2010), a total of 8 measurement items, the components with eigenvalues greater than 1 are extracted by factor analysis, which can explain 69.35% of the overall variance, and the factor load of each item is between 0.78–0.82, and the alpha coefficient is 0.91.

Research Results

Common Method Bias Test

In this study, measures such as anonymity are used to control the test (Zhou & Long, 2004). In the process of data analysis, the Harman factor test is used to examine the common method biases. All observational variables are put together for exploratory factor analysis. The first principal component obtained without rotation is 22.78%, which is far less than the critical value of 40%. Therefore, the homology deviation problem in this study is not serious.

Confirmatory Factor Analysis

As the three variables in this study are measured by questionnaire, confirmatory factor analysis is used to examine the discriminatory power of variables before further analysis.

In this study, SPSS Amos 24.0 software is used to test the structural validity of each variable adopting confirmatory factor analysis. Firstly, a three-factor model is set up; Then, χ^2, RMSEA, CFI, GFI, NFI and other indicators are used to illustrate the fit of the model (see Table 1). It can be seen from table 1 that the fitting index $\chi^2(662) = 1982.36$ ($p > 0.05$), RMSEA = .06, CFI = .96, GFI = .90, NFI = .94 in the three-factor model, which shows that the model fits quite

well. This study also validates four alternative models simultaneously: Model 2, combining self-regulated learning strategies and music learning outcomes into one factor; Model 3, combining innovative teaching effectiveness and self-regulated learning strategies into one factor; Model 4, combining innovative teaching effectiveness and music learning outcomes into one factor; and model 5, combining all variables into one factor. According to the comparison of the fitting indices of the five models, model 1 fits the data better than the other four models. Burnham et al. (2010) propose the exponents in model comparison and model selection: $\triangle AIC = AIC - AIC_{min}$, AIC_{min} in the formula is the smallest of the different AIC values for a range of related models. This transformation shows that the best model has a $\triangle AIC$ value of 0 and all the other models are positive. In a range of relevant candidate models, the $\triangle AIC$ can provide sufficient evidence for comparison between models. The rules for interpreting AIC are as follows: support is highest at $\triangle AIC \leq 2$; support for the model is lower at $4 \leqslant \triangle AIC \leqslant 7$; and no longer supported at $AIC \geqslant 10$. The $\triangle ACI$ value of model 5 is 0. Thus, the uniqueness of the three variables in this study is well supported (Burnham et al., 2010).

Table 1: Results of Confirmatory Factor Analysis

M	Factor	χ^2	df	RMSEA	CFI	GFI	NFI	ΔAIC
1	Three factors (ITE, SLS, MLO)	1982.36	662	.06	.96	.90	.94	0
2	Two factors (ITE, SLS+MLO)	2473.40**	664	.06	.95	.88	.87	42.17
3	Two factors (ITE +SLS, MLO)	2799.82***	664	.11	.87	.83	.85	85.83
4	Two factors (SLS, ITE +MLO)	2698.15***	664	.09	.90	.87	.80	14.51
5	Single factor (ITE +SLS+MLO)	3227.76***	665	.09	.86	.85	.83	12.57

Notes: **p<.01, ***p<.001 (two-tailed tests); ITE=Innovative Teaching Effectiveness; SLS=Self-Regulated Learning Strategies; MLO=Music Learning Outcomes

Descriptive Statistics

The results of the correlation analysis table of the research variables are shown in Table 2. It can be seen from the table that there is a significant positive correlation between innovative teaching and self-regulated learning strategies (r = 0.33, p < 0.01), and a significant positive correlation with music learning outcomes (r = 0.241, p < 0.01). There is a significant positive correlation between self-regulated learning strategies and music learning outcomes (r = 0.38, p < 0.01).

Table 2: Descriptive Statistical Analysis and Correlation Analysis of Variable

Variable	Mean	SD	1	2	3	4	5	6
1 Control variable	1.76	0.43	–					
2 Gender	3.76	0.94	0.01	–				
3 Student source	2.30	1.17	−0.03	0.04	–			
4 ITE	3.69	0.52	−0.01	0.07	0.04	–		
5 SLS	3.88	0.61	0.33	0.17	0.31**	0.33**	–	
6 MLO	3.63	0.49	0.41	0.14	0.43**	0.41**	0.38**	–

Note: *p<0.05; **p<0.01; ***p<0.001; ITE=Innovative Teaching Effectiveness; SLS=Self-Regulated Learning Strategies; MLO=Music Learning Outcomes

Hypothetical Test

Hypotheses for moderator variables are examined using the hierarchical regression method recommended by Baron and Kenny (1986). In order to test the moderating effect of self-regulated learning strategies between innovative teaching effectiveness and music learning outcomes, the variable data is first standardized, and then the hierarchical regression method is used to test. The results are shown in Table 3. In Model 2, innovative teaching effectiveness has a significant impact on music learning outcomes (β = 0.39, p < 0.001), indicating that the higher the innovative teaching effectiveness, the higher the students' music learning outcomes, so hypothesis 1 is supported. self-regulated learning strategies have a significant effect on music learning outcomes (β = 0.22, p < 0.01), indicating that the higher the self-regulated learning strategy, the higher the students' music learning outcomes, so hypothesis 2 is supported. Model 3 shows that after controlling for the main effects of innovative teaching effectiveness and self-regulated learning strategies, the interaction term of innovative teaching effectiveness and self-regulated learning strategies has a significant impact on music learning outcomes (β = 0.20, p < 0.05), indicating that self-regulated learning strategies has a moderating effect on the relationship between innovative teaching effectiveness and music learning outcomes.

Table 3: Multiple Linear Regression

	Dependent variable: MLO		
	M1	M2	M3
Control variable			
Gender	−0.06	0.04	−0.04
Student source	0.01	0.02	0.05
Grade	−0.04	−0.05	−0.07
Main effect			
ITE		0.39***	0.28***
SLS		0.22**	0.19**
Moderating effect			
ITE×SLS			0.20**
R2	0.01	0.22***	0.25***
△R2	-	0.22***	0.03***

Note: *p<0.05; **p<0.01; ***p<0.001; ITE=Innovative Teaching Effectiveness; SLS=Self-Regulated Learning Strategies; MLO=Music Learning Outcomes

A moderating effect diagram of self-regulated learning strategies is drawn to clarify the direction and trend of the moderating effect according to the method recommended by Aiken and West (1991). Figure 2 shows that the effect of innovative teaching effectiveness on music learning outcomes is enhanced when teachers have a high level of self-regulated learning strategies. To further investigate the moderating effect, a simple slope analysis is performed. The results show that when the self-regulated learning strategies literacy level is lower than 1 standard deviation, the regression slope of innovative teaching effectiveness on music learning outcomes is 0.20, p<0.001; When the self-regulated learning strategies literacy level is higher than 1 standard deviation, the regression slope is 0.48, p<0.001. Therefore, H2 is supported.

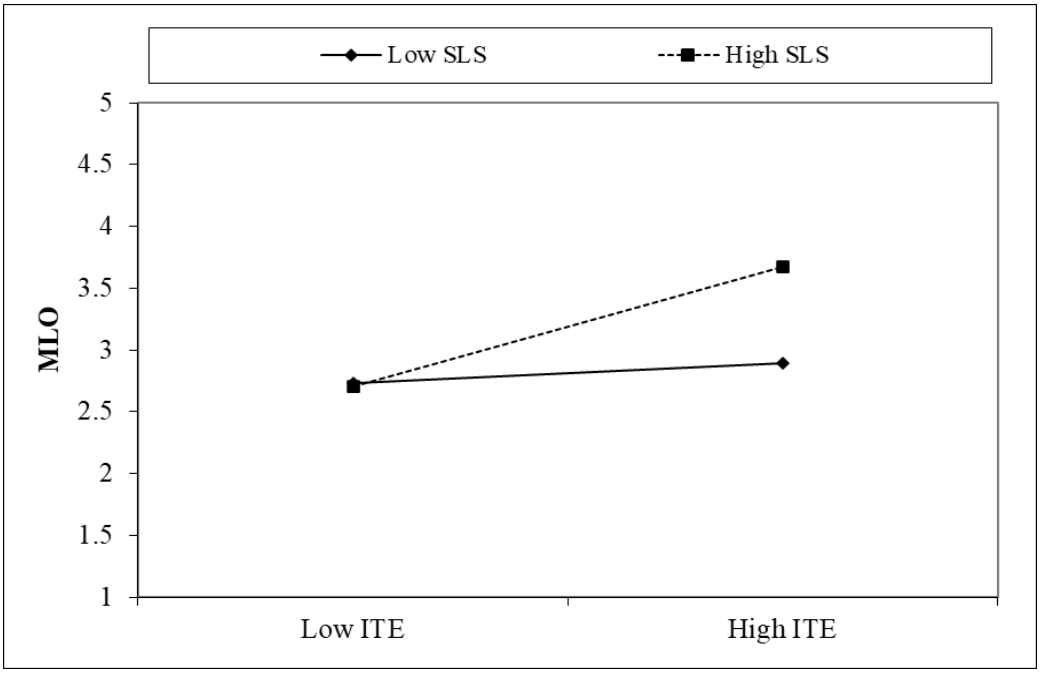

Fig.2 Interaction Diagram of Self-Regulated Learning Strategies

Discussions

According to the results, innovative teaching positively affects students' music learning outcomes, consistent with the conclusions of Burnard (2007), Millar and Dahl (2011), Zhao et al. (2021). Students' self-regulated learning strategies positively affect music learning outcomes, the higher the degree of students' self-regulated learning strategies, the positive relationship between innovative teaching effectiveness and music learning outcomes will also increase, similar to the research conclusions of scholars Albelbisi and Yusop (2019), Wong et al. (2019), Anthonysamy et al. (2020), Zelenak (2020), Carter Jr et al. (2020), Kim and Kim (2021).

It is important to change the concepts of teaching, deepen the understanding of teaching, and enhance the effectiveness of teaching innovation. According to the results of this study, it is found that there is a positive correlation between the effectiveness of teaching innovation and the outcomes of music learning. It can be seen that the higher the effectiveness of teaching innovation, the higher the degree of students' music learning outcomes. Therefore, in the face of the ever-changing educational environment and technological development, teachers must continue to grow professionally and learn throughout their lives to innovate and meet the challenges. Teachers should also have the connotation of "cross-field, international vision", demonstrating the ability to work across professional domains and have a macro international

perspective to achieve educational innovation in different areas such as organizational innovation, curriculum planning and cross-field learning.

It also makes sense to stimulate teachers' teaching innovation ability. Teachers design the teaching sessions in an interesting and innovative way so that students will have a strong interest in learning. Such a classroom will trigger students' enjoyment. Only when students learn actively can they significantly improve their music learning outcomes.

Conclusion

This study find that teachers' innovative teaching effectiveness can significantly improve the music learning outcomes of art students. The development of teachers' professional role awareness is the basis for their professional image building and the basis for innovative teaching. Therefore, colleges must require teachers to adapt to the changing social situation and the corresponding changes in role transformation to improve the status quo of innovative teaching. Students' self-regulated learning strategies can not only directly improve music learning outcomes, but also promote the positive relationship between teachers' innovative teaching effectiveness and students' music learning outcomes. Therefore, colleges and parents should help students to develop their self-regulated learning strategies, so as to actively acquire knowledge and skills. In order to achieve learning goals, some special self-regulated learning strategies can be flexibly applied to facilitate music learning and improve music learning outcomes based on self-efficacy.

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