

Explore the relationship between middle school teachers' self-efficacy and collaborative lesson planning through a questionnaire method

Fangyu Liu^{1,*}

¹ Department of Psychology, Beijing Normal University, No.19, Xijiekouwai St, Haidian District, Beijing, 100875, P.R.China

Abstract. In Chinese schools, teachers usually gather together to prepare lessons and discuss teaching goals, methods, progress, and so on, in order to achieve better teaching results. This is called "Collective Lesson Preparation", abbreviated as CLP. Several researchers have studied the relationship between self-efficacy and various teaching practices, yet less attention has been given to the specific relationship between teachers' self-efficacy and CLP. Therefore, this study explored the relationship between CLP and self-efficacy by designing and distributing questionnaires and conducting Pearson correlation analysis on the questionnaire data. Research has found that there is a highly significant positive correlation ($r=0.296$, $p=0.000$) between middle school teachers' involvement in CLP and their self-efficacy. Specifically, out of the seven dimensions of CLP, only CLP topic and content showed no significant correlation, while the other 5 dimensions, CLP environment, team, process, guidance, and mechanism, all have an extremely significant positive correlation with self-efficacy. This indicates that when middle school teachers participate in CLP, the environment, team, process, leadership, and mechanism of CLP are all correlated with their high self-efficacy. In the future, schools and teachers can focus on improving the CLP method, which may not only enhance teaching effectiveness but also improve teachers' self-efficacy.

1 Introduction

The Ministry of Education in China encourages the creation of Teaching Research Groups, where teachers collaborate to create lesson plans and instructional materials using their combined expertise and resources [1]. Teachers in such a group decide together on the finest techniques that could lead to fruitful educational outcomes. This is in contrast to the technique of designing individual lessons, where a teacher works alone to create a sequence of learning delivery components for the pupils [2]. Teachers preparing lessons together in such a group is also known as Collaborative Lesson Planning (CLP). And now, CLP is becoming increasingly popular among teachers as a way to enhance student learning outcomes and improve teachers' professional development.

Self-efficacy is the term used to describe people's perceptions of their skills to successfully complete a certain course of action [3]. Currently, many researchers have paid attention to the relationship between self-efficacy and teachers or teaching. In educational research, it has been found by researchers that teachers with low self-efficacy encounter greater difficulties in teaching, have higher work pressure [4], and lower job satisfaction [5]. Additionally, several researchers have studied the relationship between self-efficacy and various teaching practices. A study by Liana T. Hill et al. found that

increasing teacher self-efficacy is related to positive educational practices. They discovered that the higher the teacher's self-efficacy, the more likely they are to use positive classroom management strategies, provide support and feedback, and use multiple teaching strategies [6]. A study on middle school math teachers found that attending professional development activities can improve their self-efficacy beliefs and such improvement can lead to better teaching quality [7]. In summary, with the increase in a teacher's self-efficacy, teaching effectiveness can also be significantly improved. Yet less attention has been given to the specific relationship between teachers' self-efficacy and CLP. In China, there is a relative lack of research focusing on the relationship between these two factors.

This study aims to explore the relationship between middle school teachers' self-efficacy and CLP through a questionnaire method. It will examine the effects of the completeness and effectiveness of the CLP system on middle school teachers' self-efficacy, and will also examine whether there are differences in the performance of middle school teachers with different self-efficacy levels participating in the CLP. A questionnaire containing basic information, CLP participation status, and the Chinese adaptation of the General Self-Efficacy Scale was developed in this study [8]. During the questionnaire administration phase, some middle school teachers in Fengnan District, Tangshan

* Corresponding author: 202011061093@mail.bnu.edu.cn

City, Hebei Province, China participated in the study. By conducting a series of data analyses on their questionnaire results, the final research findings can be obtained, which can not only provide a new perspective for improving middle school teachers' CLP but also offer a new perspective for enhancing middle school teachers' self-efficacy.

2 Method

2.1 Questionnaire design

The process of this study includes designing a questionnaire, distributing it, collecting survey results, analyzing data, and drawing conclusions finally. Among them, questionnaire design is a critical aspect of this study, aimed at measuring the self-efficacy and CLP of middle school teachers. Due to the fact that the survey participants in this study are Chinese citizens, the language of the survey questionnaire is Chinese.

The survey questionnaire consists of three parts: basic information, a CLP survey, and a self-efficacy scale. The basic information section includes gender, age, teaching experience, subject taught and level of education. It is worth noting that the survey in this study is completely anonymous. The CLP survey section includes seven questions, investigating the CLP situation of middle school teachers from seven dimensions: CLP environment, topic, content, team, process, guidance, and mechanism. Each dimension has three options to choose from: "yes", "no", and "uncertain". The questionnaire has explanations and definitions for each dimension. For example, in the dimension of CLP environment, the question is "Does the CLP you participate in have a harmonious environment?" Below the question, there is an explanation and definition of what a harmonious environment means, such as "A harmonious CLP environment includes a good communication atmosphere, harmonious and democratic interpersonal relationships, as well as mutual respect and tolerance." By this way, it enables the respondents to have a clearer judgment while answering the questionnaire. The Self-efficacy Scale section of the questionnaire directly quotes the Chinese adaptation of the General Self-Efficacy Scale [8]. This study recognizes the reliability and validity of the GSE questionnaire designed by Ralf Schwarzer & Matthias Jerusalem [9], and believes that it will provide valuable data for this research. Therefore, this study has used the GSE questionnaire in this research.

Finally, the research questionnaire was created in an electronic version on the Qualtrics platform, and participants answered it on their mobile phones by scanning the QR code. The electronic version of the questionnaire was distributed in the WeChat group chat of middle school teachers in Fengnan District, Tangshan City, Hebei Province. Middle school teachers in the group chat voluntarily filled out the questionnaire without any time restriction. If exit the questionnaire filling interface due to some reasons, respondents can scan the QR code again to continue answering the

remaining questions, and the previously filled answers will not disappear. This can avoid some unnecessary troubles, such as network interruption interrupting the questionnaire filling process, or respondents forgetting or changing their answers to previous questions. In the end, all the questionnaire data filled out by the participants were recorded on the Qualtrics platform, which facilitates subsequent data export and analysis.

2.2 Participants

The participants in this study are middle school teachers from Fengnan District, Tangshan City, Hebei Province, China. During the study period, a total of 303 questionnaires were received, of which 288 were valid. There were 15 questionnaires with missing data and therefore were not included in subsequent statistical analysis. Of the 288 participants, male participants accounted for 14% and female participants accounted for 86%. The age of the participants was most concentrated in the 41-50 age group, accounting for 47.22% of all participants. The teaching subjects of the participants included Chinese, mathematics, English, physics, biology, history, politics, and geography. Among them, participants teaching mathematics accounted for the largest proportion, at 40.28%. From the descriptions of the participants in the experiment, it can be seen that 46.53% of the teachers have been teaching for 21-30 years. 92.36% of the participants have a bachelor's degree, followed by 5.21% with an associate degree or lower, and 2.43% with a master's degree. Among these participants, no one has an education level exceeding a master's degree.

3 Results

When conducting data analysis, this study quantified the CLP survey section with a total of seven questions, corresponding to the seven dimensions. For each question, "yes" was scored 2 points, "uncertain" was scored 1 point, and "no" was scored 0 points. Finally, the scores of the seven questions were added together to obtain the total score for measuring the effect of CLP, which is used for subsequent data analysis. Through Pearson correlation analysis of the received questionnaire data, the study found that there is an extremely significant positive correlation between the level of participation of junior high school teachers in CLP and their level of self-efficacy. The results of data analysis using SPSS showed that the correlation coefficient between the two variables was 0.296, and the p-value was less than 0.01 (Table 1). This means that when junior high school teachers have a higher level of participation in CLP, their level of self-efficacy will also increase, and vice versa. When junior high school teachers participate in a more complete and effective CLP environment, they will gain more from the process, which is beneficial for enhancing their self-efficacy. On the contrary, when junior high school teachers have a higher level of self-efficacy, they tend to invest more actively in their work, thereby promoting the formation

of a good CLP environment and mechanism, which is beneficial for making the effects of CLP better.

Table 1. Pearson correlation analysis results

		Total score of GSE questionnaire	Statistical score of CLP condition
Total score of GSE questionnaire	Pearson correlation	1	.296**
	Sig. (two-tailed)		.000
	Number of cases	282	282
Statistical score of CLP condition	Pearson correlation	.296**	1
	Sig. (two-tailed)	.000	
	Number of cases	282	285

** . The correlation is significant at the 0.01 level (two-tailed).

Specific to the seven dimensions of CLP surveys, the analysis results show that only CLP topic and content showed no significant correlation, while the other 5 dimensions, CLP environment, team, process, guidance, and mechanism, all have an extremely significant positive correlation with self-efficacy (Table 2). This result can be explained by the fact that compared to the other five dimensions, the CLP theme and content are more rational and less vivid. The psychological activities and changes of teachers in CLP are difficult to be influenced by CLP themes and content. However, this is not the case for the other five dimensions. A harmonious CLP environment includes a good communication atmosphere, harmonious interpersonal relationships, mutual respect, and mutual tolerance. If teachers are not in a harmonious environment during CLP, they are likely to encounter difficult interpersonal communication, which may change their self-evaluation and affect their level of self-efficacy. The other four dimensions are similar in that the CLP team, processes, leadership, and mechanisms all involve communication and interaction between people, making it easy to connect with changes in self-efficacy. These are different from rigid lesson preparation content and themes.

Table 2. Summary of the r-values and p-values of each dimension of CLP.

	<i>r</i>	<i>p</i>
environment	.200	.001
topic	.105	.077
content	.095	.113
team	.236	.000
process	.180	.002
guidance	.216	.000
mechanism	.219	.000

4 Discussion

The results of this study are similar to those of previous studies and can be mutually explained. Previous research has shown that teachers with low self-efficacy encounter greater difficulties in teaching, have higher work pressure [4], and lower job satisfaction [5]. The results of this study show that the higher the participation of junior high school teachers in CLP, the higher their self-efficacy level will be, and vice versa. Teachers with high levels of self-efficacy actively participate in CLP, which is a very important link in teachers' work. Therefore, teachers with high levels of self-efficacy have higher enthusiasm for their work. Bakker and Demerouti proposed the job demands-resources model, which suggests that work demands and resources interact to affect employee well-being and work engagement [10]. Workplace resources like autonomy and social support can counteract the detrimental impacts of workplace demands and result in better work outcomes, whereas workplace demands like workload and time constraints are linked to stress and burnout [11]. The same is true for teachers, who are highly motivated to work, which means that they encounter fewer difficulties in teaching, less work pressure and higher job satisfaction. This is consistent with the results of previous studies [6,7]. When teachers' participation in collective lesson preparation is high, they often gain something from it and improve their sense of accomplishment, thus improving their self-efficacy. When teachers' self-efficacy level is high, they tend to perform better in their work and devote themselves to collective lesson preparation with a more positive attitude, thus promoting the effect of collective lesson preparation (Fig. 1).

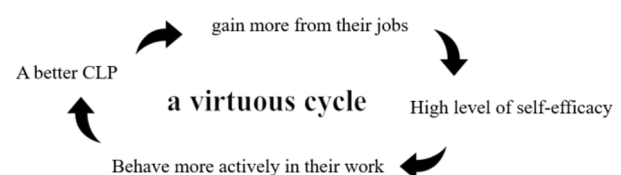


Fig. 1. Schematic diagram of the virtuous circle between CLP and self-efficacy

Photo/Picture credit: Original

The innovation of this study lies in selecting a specific teaching method, that is, CLP, to study its relationship with teacher self-efficacy. Previous educational psychology research had been quite broad and generalized in investigating the relationship between teaching and teacher self-efficacy but had not specifically studied the relationship between CLP and teacher self-efficacy. This study comprehensively summarized seven dimensions of CLP in a systematic manner. This provided clear evaluation criteria for participation in CLP and allowed for quantitative analysis. Moreover, during data analysis, the relationship between each dimension and teacher self-efficacy was specifically analysed.

However, there are still many limitations to this study. First of all, the participants recruited in this study were not evenly distributed in terms of gender and teaching subjects. In terms of gender distribution, there were

significantly fewer males than females. In terms of teaching subjects, the majority of participants taught mathematics, accounting for as much as 40%. It is precisely because the distribution of participants in terms of gender and teaching subjects is uneven that the study results may be affected. Follow-up studies could focus on a specific subject or further explore the influence of gender as a factor. In addition, the participants recruited for this study were concentrated in one region, which limited their representativeness. Different regions may have different teaching and CLP policies, which may also affect the study results. Second, the interpretation of the relationship between the seven dimensions of the CLP survey and the level of teacher self-efficacy still needs to be determined. Regarding the 7 dimensions of CLP, the analysis results show that only the dimensions of topic and content of CLP do not show a significant correlation, while the other 5 dimensions, namely environment, team, process, guidance, and mechanism, are all extremely positively correlated with the level of self-efficacy. Currently, the following explanations can be made for this result. Compared with the other five dimensions, the topic and content of CLP are more rational and lack variability. The topic and content of CLP are unlikely to influence the psychological activity and psychological changes of junior middle school teachers. However, this is not the case for the other five dimensions. A harmonious CLP environment includes a good communication atmosphere, harmonious interpersonal relationships, mutual respect, and tolerance. If teachers are not in a harmonious environment during classroom teaching, they may encounter problems in interpersonal communication, which may change their self-evaluation and affect their level of self-efficacy. The similarity of the other four dimensions is that the CLP team, process, guidance, and mechanism all involve communication and interaction between people, which can easily be related to changes in self-efficacy. These are different from relatively rigid lesson preparation content and topics. Follow-up studies could add an interview section on top of the questionnaire. Conducting interviews with the participating subjects can provide a clearer and more detailed understanding of more information. Future research can start from a broader theoretical framework, such as self-determination theory, capital theory, social cognitive theory, etc., to explore the internal mechanisms and influencing factors of CLP self-efficacy. Third, follow-up studies could use models or other techniques to conduct a more systematic data analysis, exploring the specific relationship between the participation of teachers in CLP and their level of self-efficacy.

In the future, the research conclusions of this study can be applied to specific teaching practices. From the perspective of the seven dimensions of CLP, teaching leaders can provide teachers with a harmonious CLP environment, equip a good and cohesive CLP team, improve the CLP process, provide authoritative CLP guidance and form a set of perfect CLP mechanisms. All these are beneficial to improve teachers' enthusiasm to participate in CLP, thus improving their self-efficacy,

and then further improving teaching quality and teachers' satisfaction.

5 Conclusion

The results of this study indicate that a good CLP environment, team, process, guidance, and mechanism can help enhance teachers' self-efficacy. Conversely, teachers with high self-efficacy are more likely to actively participate in CLP, thus promoting its effectiveness. Together, these factors form a virtuous cycle.

The results of this study have provided new insights into the factors that influence teachers' involvement in collaborative lesson planning and their attitudes towards it. Moreover, it will contribute to the understanding of how teachers' self-efficacy can be enhanced to improve their participation in collaborative lesson planning and ultimately support the development of effective teaching practices. Therefore, there is a recommendation that schools continuously improve CLP processes and mechanisms, provide good CLP leadership, and promote the formation of a harmonious CLP environment. This not only helps improve teaching effectiveness but also boosts teachers' self-efficacy.

References

1. R. Yuan, J. Zhang, *TAER*, **25**, 817-826 (2016).
2. S. B. Gutierrez, *TD*, **25**(1), 37-52 (2021).
3. A. Bandura, *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman and Company, (1997).
4. F. D. Betoret, *Educ. Psychol.*, **26**(4), 519-539 (2006).
5. R. M. Klassen, N. E. Perry, A. C. Frenzel, *J. Educ. Psychol.*, **104**(1), 150 (2012).
6. L. T. Hill, J. L. Degol, J. A. Christodoulou, S. Goldin-Meadow, *Dev. Psychol.*, **52**(9), 1435-1446 (2016).
7. E. Ozkan, C. Tekkaya, The effect of professional development activities on improving middle school mathematics teachers' self-efficacy beliefs. In Meletiou-Mavrotheris, M. & Kattou, M. (Eds.), *Mathematics Education in a Connected World* (pp. 393-405). Springer International Publishing, (2015).
8. J. X. Zhang, R. Schwarzer, *Psychologia*, **38** (3) 174-181 (1995).
9. R. Schwarzer, M. Jerusalem, Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 3537). Windsor, England: NFER-NELSON, (1995).
10. E. Demerouti, A. B. Bakker, F. Nachreiner, W. B. Schaufeli, *J. Manag. Psychol.*, **16**(3), 383-404 (2001).
11. A. B. Bakker, E. Demerouti, The job demands-resources model: State of the art. *Journal of managerial psychology*, **22**(3), 309-328 (2007).