Research on Relations between Teachers' Teaching Efficacy and Job Burnout Based on Meta-analysis

Yuyan Luo[1, 2, a], Ting Deng[1, b], Siqi Liao[1, c], Yong Liu[1, d, *], and Zerui Su[1, e]

[1] *College of Management Science, Chengdu University of Technology, Chengdu 610059, China;*
[2] *Post-doctorate R & D Base of Management Science and Engineering, Chengdu University of Technology, Chengdu 610059, China.*
[a] *luoyuyan.cdut@qq.com,* [b] *dengtingcd@qq.com,* [c] *kylinliao@foxmail.com,* [d] *liuyong1@cdut.cn*
[e] *zoeee_98@qq.com*
**corresponding author*

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Abstract: Based on previous thoughts and research results, this paper analyzes the relations between teachers' teaching efficacy and job burnout with meta-analysis. According to domestic and international scholars, the teachers' burnout is divided into three dimensions, emotional exhaustion, non-human tendency and personal low sense of achievement. Similarly, teachers' teaching efficacy is divided into two dimensions, general teaching efficacy and personal teaching efficacy. A correlation analysis is conducted between two dimensions of teachers' teaching efficacy and job burnout. It shows that the three dimensions of job burnout are negatively correlated with the two dimensions of teaching efficacy, that is, job burnout is observably negatively correlated with teaching efficacy, and moreover, teachers' job burnout and teachers' teaching efficacy can be mutual predicted, so as to better understand the teaching state of teachers in a better and timely manner.

1. Introduction

Education is a top priority for every nation and even the whole country. As a group closely related to education, teachers have always attracted much attention. Generally, teachers are thought to be under high pressure and high intensity. However, high pressure always leads to low working efficiency [1-2]. If the pressure is not alleviated for a long time, it will tend to reduce the happiness of working teachers, hinder their professional development, and finally form the job burnout. As a result, the teachers will lose their appetite for the job and muddle through it. To prevent this problem, scholars have conducted a series of studies on teachers' job burnout, among which the teachers' teaching efficacy is partly involved [3-5]. Leiter's study in 1992 concludes that burnout is a crisis of efficacy; Fricdman and Farber's study in 1992 shows that the teachers with poorer management skills in class tend to have higher job burnout; Also, Chawlisz, Altsaiwer and Russell's study in 1992 thinks that teachers with lower teaching efficacy usually have higher burnout [6-8]. In China, Liu's study in 2004 has pointed out that teaching efficacy is negatively correlated with job burnout, and teachers with lower teaching efficacy show more serious emotional exhaustion and dehumanization (non-human tendency); In 2005, Xu and Zhu found that teaching

efficacy had a conspicuous negative predictive effect on the three dimensions of teachers' burnout; Li, Yang and Shen's research in 2007 has pointed out that teachers' general teaching efficacy has a prominent predictive effect on the emotional exhaustion of job burnout, and teachers' personal teaching efficacy has a prominent predictive effect on dehumanization(non-human tendency) and low sense of achievement [9-11].

Most of the previous studies used questionnaires to collect data, and the results were more or less affected by the way of questionnaire distribution and geographical limitations. Meta-analysis is a new method of quantitative literature research, but it is not often used. Therefore, based on the previous research results, this paper uses meta-analysis to further analyze the relationship between teachers' teaching efficacy and job burnout.

The statistical method of meta-analysis used in this paper is to reorganize the statistics of existing empirical literatures and collect the data. Then, by using the corresponding statistical formula, the statistical indicators are used to carry out the statistical analysis again. Consequently, the statistical significance gained in the analysis is used to analyze the real correlation between the two variables to exclude research error as far as possible. We're willing to find the correlation between the two and predict teachers' job burnout by teaching efficacy [12].

2. Literature Review

2.1 Teaching Efficacy

The teaching efficacy is derived from the self-efficacy theory proposed by Bandura in 1977 [13-14]. Then, Gibson and Dembo designed the teaching efficacy scale. They used the method of factor analysis and have pointed out that teachers' teaching efficacy consists of general teaching efficacy and personal efficacy; general teaching efficacy refers to the general view and judgment of teachers on the role of education in students' development, and the personal teaching efficacy refers to their evaluation of teaching effect.

2.2 Job Burnout

The concept of job burnout is originated in 1973 from Freudenberger, a famous American psychologist and alienist. He thinks that job burnout is engaged in the individual in helping industry who cannot handle the excessive demands of personal energy and resources from the outside and produce the psychological consumption from various dimensions. The most cited definition of job burnout at the moment is proposed by Maslach and Jackson. They think that job burnout is a syndrome formed by emotional exhaustion, dehumanization and low sense of achievement, usually happening among individuals of the helping industry [15-20]. Also, as for the teaching occupation, in 2014, the scholar Jiang thought that teachers' job burnout was an abnormal psychological behavior with a high level of mental fatigue and tension in emotion, cognition and behavior, referring to the constant exhaustion formed in the long-term working pressure and the extreme frustration caused by the contradictions and conflicts with others; the scholar Wang has pointed out in 2017 that teachers' job burnout refers to the extreme reaction shown when teachers cannot cope with working pressure effectively and a state of exhaustion of emotion, attitude and behavior formed in their experience of long-term pressure[21-22].

3. Research Hypothesis

3.1 The Relationship between Teaching Efficacy and Emotional Exhaustion

Teachers' efficacy refers to teachers' subjective judgment of their effects on the students' learning behavior and ability, which will tend to affect teachers' cognitions and behaviors. Also, the emotional exhaustion refers to their emotional fatigue and lack of passions. The study conducted by scholar Liu in 2004 has pointed out that teachers' emotional exhaustion will be more serious if the teaching efficacy gets lower. Meanwhile, the study done by Li has found that teaching efficacy has a dominant predictive effect on the emotional exhaustion dimension of job burnout. Therefore, we made hypotheses as follows:

Hypothesis 1a: The general teaching efficacy is negatively correlated with emotional exhaustion.

Hypothesis 1b: The personal teaching efficacy is negatively correlated with emotional exhaustion.

3.2 The Relationship between Teaching Efficacy and the Tendency of Dehumanization

The non-human tendency refers to the phenomenon that individuals in groups lose their identity and responsibility. Referring to the definition of efficacy, the results of Chinese scholar Liu's study in 2004, that is, teachers with lower teaching efficacy show more serious emotional exhaustion and dehumanization, and the results of scholar Li, Yang and Shen's research in 2007, that is, teachers' teaching efficacy has a prominent predictive effect on dehumanization and low sense of achievement, we made hypotheses as follows:

Hypothesis 2a: The general teaching efficacy is negatively correlated with the tendency of dehumanization.

Hypothesis 2b: The personal teaching efficacy is negatively correlated with the tendency of dehumanization.

3.3 The Relationship between Teaching Efficacy and Low Sense of Achievement

The sense of achievement is an indicator to measure the satisfaction of individuals after completing a task. The lower sense of achievement they have, the harder they will obtain satisfaction. Scholar Xu has pointed out that the efficacy has a prominent negative predictive effect on low sense of achievement, and the above three scholars have also pointed out that the teaching efficacy has a conspicuous predictive effect on the low sense of achievement. Therefore, we made hypotheses as follows:

Hypothesis 3a: The general teaching efficacy is negatively correlated with the low sense of achievement

Hypothesis 3b: The personal teaching efficacy is negatively correlated with the low sense of achievement.

4. Research Methods

4.1 Data Sources

The metadata of this meta-analysis comes from published papers. This study conducted a comprehensive retrieval of relevant Chinese and English literatures. Databases including Elsevier Science Direct, Web of Knowledge, Springer, Google Scholar, the CNKI database, the CSSCI and

the VIP database were used for the retrieval. The terms, teaching efficacy, general teaching efficacy, personal teaching efficacy, job burnout, non-human tendency, low sense of achievement and emotional exhaustion were chosen as titles, keywords, abstracts to search for relevant literatures.

The retrieval time is due in 2017. The standards of the retrieval are as shown below.

A.　Focus on the relations between teachers' teaching efficacy and job burnout.

B.　Have integral data or calculable data.

C.　Have a clear sample size.

After the screening, there are 14 papers reaching the standards.

4.2 Statistical Analysis

The statistical tool used in this study is Comprehensive Meta-Analysis software, which can obtain the analysis results of fixed effect model and random effect model. These two effect models differ in the use of weights when calculating weights. "The former calculates the weights through the variation in one group, while the latter calculates the weights through the variation between groups. In general, it is based on the results of homogeneity test to choose the appropriate analytical method, that is, when the effect value is heterogeneous, the random effect model is selected, otherwise the fixed effect model is selected." [23].

5. Results

This study reflects the relationship between teachers' teaching efficacy and job burnout through funnel chart at first, and then for the homogeneity test of related research results.

5.1 Effect Value Distribution and Homogeneity Test

Fig. 1 reflects the distribution of the effect values of general teaching efficacy and emotional exhaustion. Fig. 2 shows the distribution of the effect values of general teaching efficacy and non-human tendency. Fig. 3 reflects the distribution of the effect values of general teaching efficacy and personal low sense of achievement. Fig. 4 reflects the distribution of the effect values of personal teaching efficacy and emotional exhaustion. Fig. 5 reflects the distribution of the effect value of personal teaching efficacy and non-human tendency. Fig. 6 reflects the distribution of the effect value of personal teaching efficacy and personal low sense of achievement.
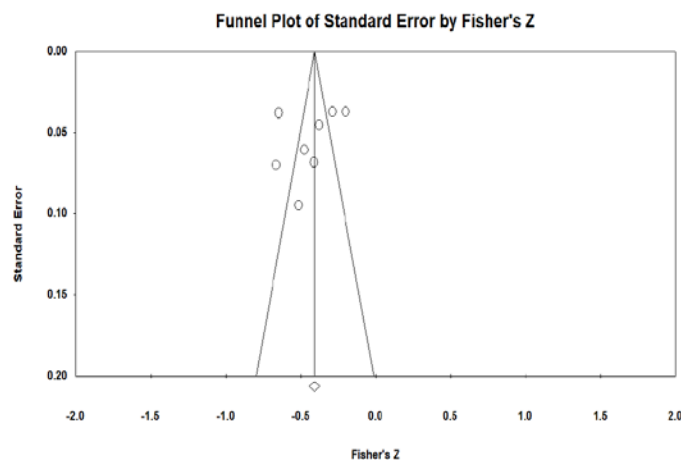

Fig. 1 Funnel plot of general teaching efficacy and emotional exhaustion.
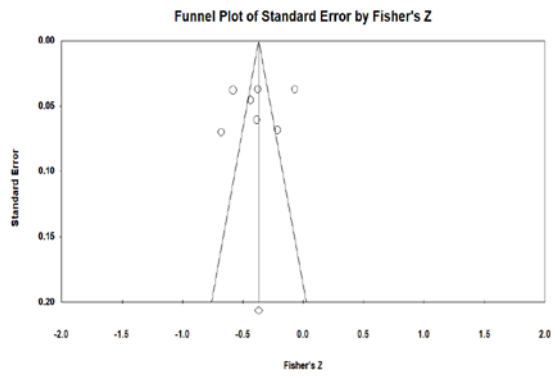
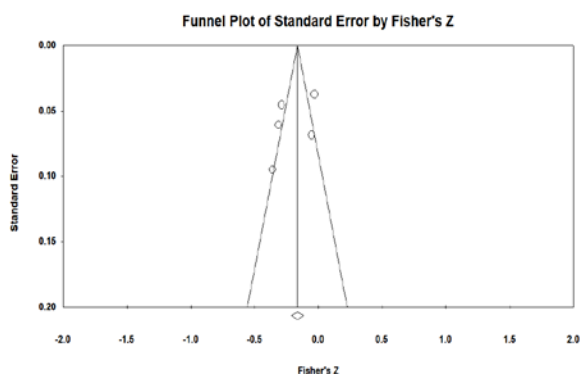Fig. 2 Funnel plot of general teaching efficacy and non-human tendency.

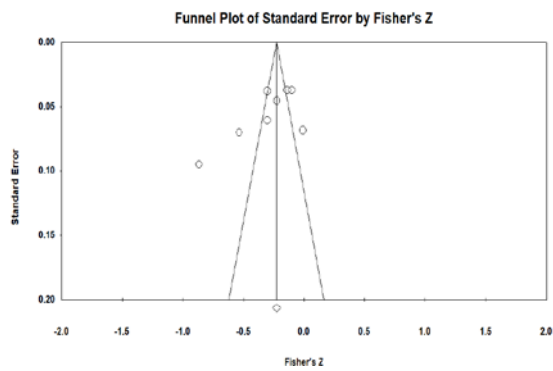Fig. 3 Funnel plot of general teaching efficacy and low sense of achievement.

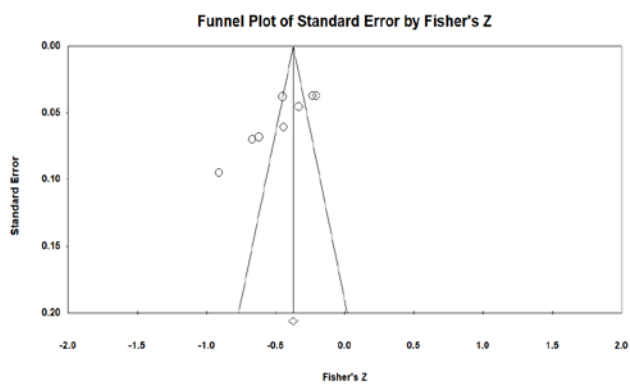Fig. 4 Funnel plot of personal teaching efficacy and emotional exhaustion.

Fig. 5 Funnel plot of personal teaching efficacy and non-human relation tendency.
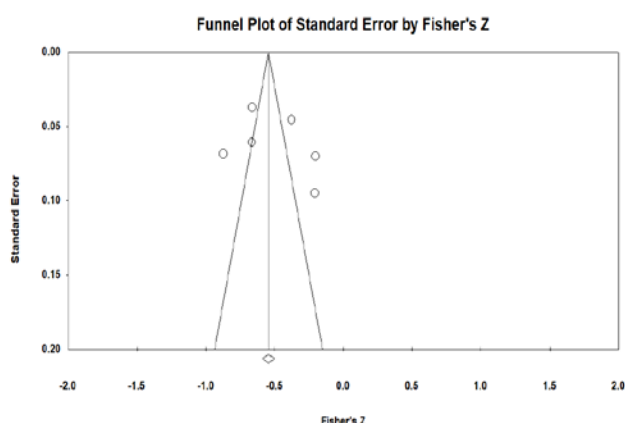
Fig. 6 Funnel plot of personal teaching efficacy and low sense of achievement.

The horizontal axis is the transformed Fisher's Z effect value, and the vertical axis is the standard deviation of Fisher's Z effect. The horizontal axis is the transformed Fisher's Z effect value, and the vertical axis is the standard deviation of Fisher's Z effect. Each point is above the funnel chart and near the average effect value, which shows that the possibility of publication bias is very small.

The results of homogeneity test are shown in Table 1 and 2. Among them, Q value and the significance test reflect the heterogeneity degree of each effect value. I-squared indicates how much variation is due to the real differences in the effect values; Tau squared represents how much variation in the research can be used to calculate weights. The effect value homogeneity test results show that the Q value is 95.947 (p<0.001), indicating that there is heterogeneity among the literatures, which may be caused by the sample difference and measurement difference of the literatures. The value of Tau-squared is 92.704, which means that 92.704% of the observed variation is caused by the real difference of the effect value, and 7.296% of the observed variation is caused by random error. The value of Tau-squared is 0.031, indicating that 3.1% of the variation in the study can be used to calculate the weights. In Table 1 and 2, the effect value homogeneity test results show that the correlation between teaching efficacy and job burnout is the heterogeneity in the selected study.

Table 1. Effect value homogeneity test results (Q statistics) (general teaching efficacy).

Model	Heterogeneity				Tau-saquared		
	Q	df(Q)	p	I-saquared	Tau-saquared	SE	Variance
Random	95.947	7	<0.001	92.704	0.031	0.02	0
Random	122.845	6	<0.001	95.116	0.043	0.028	0.001
Random	33.327	4	<0.001	87.998	0.022	0.02	0

5.2 Test Results

According to the data encoding, eight studies (N=3444) record the emotional exhaustion , general teaching efficacy and personal teaching efficacy coefficient of correlation and the correlation coefficient of non-human tendency and personal teaching efficacy; Seven studies (N=3230) record the correlation coefficient between non-human tendency and general teaching efficacy; 6 studies (N=2025) record the correlation coefficient between personal low sense of achievement and personal teaching efficacy; 5 studies (N=1818) record the correlation coefficient between personal low sense of achievement and personal teaching efficacy (Table 3, Table 4).

Table 2. Effect value homogeneity test results (Q statistics) (personal teaching efficacy).

Model	Heterogeneity				Tau-saquared		
	Q	df(Q)	p	I-saquared	Tau-saquared	SE	Variance
Random	97.566	7	<0.001	92.825	0.032	0.021	0
Random	102.946	7	<0.001	93.2	0.034	0.022	0
Random	87.422	5	<0.001	94.281	0.053	0.04	0.02

Table 3. The stochastic effect model of job burnout and general teaching efficacy.

Job burnout	Model	Sample size	Effect values and 95% confidence intervals			Two-tailed test	
			Point estimation	lower limit	Upper limit	Z	P
Emotional exhaustion	Random	3344	-0.415	-0.5	-0.304	-6.729	<0.001
Non-human tendency	Random	3230	-0.371	-0.5	-0.227	-4.823	<0.001
Low sense of achievement	Random	1818	-0.163	-0.2	-0.06	-6.977	<0.001

Table 4. The stochastic effect model of job burnout and personal teaching efficacy.

Job burnout	Model	Sample size	Effect values and 95% confidence intervals			Two-tailed test	
			Point estimation	lower limit	Upper limit	Z	P
Emotional exhaustion	Random	3344	-0.255	-0.402	-0.165	-4.478	<0.001
Non-human tendency	Random	3344	-0.438	-0.54	-0.325	-6.914	<0.001
Low sense of achievement	Random	2025	-0.461	-0.601	-0.301	-5.127	<0.001

The results show that the correlation coefficient of emotional exhaustion and general teaching efficacy is -0.415(p<0.001); the correlation coefficient of emotional exhaustion and personal teaching efficacy is -0.255(p<0.001); The correlation coefficient of non-human tendency and general teaching efficacy is -0.371 (p<0.001); the correlation coefficient of non-human tendency and personal teaching efficacy is -0.438 (p<0.001); The correlation coefficient of personal low sense of achievement and general teaching efficacy is -0.163 (p<0.001); the correlation coefficient of personal low sense of achievement and personal teaching efficacy is -0.461 (p<0.001). The results of meta-analysis show that there is a significant negative correlation between the three dimensions of job burnout and the two dimensions of teaching efficacy. As a result, Hypothesis 1a, 1b, 2a, 2b, 3a, 3b are all supported.

6. Discussion and Conclusion

This paper studies on the relationship between teachers' teaching efficacy and teachers' burnout, using the meta-analysis. The study covers 14 literatures and 20 studies, with 5,369 samples in total. The results show that teachers' teaching efficacy is negatively correlated with job burnout.

6.1 Discussion

The relationship between teachers' teaching efficacy and job burnout. It can be concluded from the study that there is a significant negative correlation between teachers' efficacy and job burnout. The relationship between general teaching efficacy and emotional exhaustion (r=-0.415, p<0.001) is the most significant; the relationship between general teaching efficacy and non-human tendency (r=-0.371, p<0.001) comes next; and then it is the relationship between general teaching efficacy and personal low sense of achievement (r=-0.163, p<0.001). In terms of personal teaching efficacy, non-human tendency's (r=-0.461, p<0.01) is the most significant; personal low sense of achievement's (r=-0.438, p<0.001) is the next; and the emotional exhaustion (r=-0.255, p<0.001) is the smallest.

6.2 Publication Bias Analysis

Publication bias is an important issue to be considered in meta-analysis. For now, the published papers may overstate the real correlation between variables, and the unpublished papers may provide more accurate estimates. Therefore, in order to reduce the publication bias effect, all available studies should be taken into account, which will make the results of meta-analysis more representative.

In general, the publication bias of the study can be observed by funnel plot. Based on the distribution of the effect values in the funnel plot, the probability of publication bias in this study is very small. According to the above results, there is no publication bias in this study.

Insufficient research

A.   There are other possible dimensions of job burnout, which may influence the results.

B.   There is still some samples' size less to a certain extent, which may also affect the outcomes.

To sum up, this study has concluded that there is a significant negative correlation between teachers' teaching efficacy and job burnout in China. It shows that teachers' job burnout can be predicted by teaching efficacy, and teachers' teaching efficacy can be improved to reduce teachers' job burnout or enhance their sense of teaching efficacy according to the dimensions of job burnout.

In these ways, we can arouse teachers' teaching enthusiasm, improve their work efficiency, promote their' professional development and contribute to the cause of education in our country.

Acknowledgments

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