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Transformational Leadership, Job Satisfaction, Organizational Culture and Organizational Commitment: A Study of Structural Equation Modeling (SEM)

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Abstract

This paper studies the relationships among transformational leadership, job satisfaction, organizational culture, and organizational commitment. The survey data of a sample of 413 teaching faculties from medical universities in Guangxi, China is analyzed by using the structural equation model (SEM). The results show that the transformational leadership of middle-level administrators from the medical universities in Guangxi has a significant positive effect on teachers' job satisfaction and university organizational culture, but has no significant positive effect on teachers' organizational commitment. It is also found that both teachers' job satisfaction and university organizational culture have a mediating role on the relationship between transformational leadership and organizational commitment. The research results suggest that middle-level administrators should improve their transformational leadership to improve teaching faculties' job satisfaction and eventually the organizational commitment.

Keywords: Transformational leadership, Job satisfaction, Organizational culture, Organizational commitment, SEM

Introduction

Transformational leadership and organizational commitment have long been studied in the literature for many industries. Burns (1978) holds the view that transformational leadership is a process in which leaders influence employees by virtue of personal power such as personality and charm, and make employees aware of the value and mission of their work by improving the needs and internal motivation of their employees, so as to motivate employees to constantly challenge and surpass themselves for higher goals.

Higher education sector is also one of the interested industries for researchers. Recently, it is argued that the modernization of university governance capacity must be promoted through university leadership transformation (Sui, 2021). Sui (2021) points out that leaders in universities influence the university organizations and their members in order to achieve university goals according to the university's organizational attributes by using personal characteristics and their legal powers and university resources. Among them, a more effective and lasting way is to change teachers' inner attitude towards their work and improve their attachment to the organizations, to stimulate their intrinsic motivation. At the same time, it helps to improve teachers' loyalty to the organization and strengthen their psychological contract with the universities. Employee's work attitude and behavior can be evaluated by job satisfaction (Aydogdu and Asikgil, 2011). Employees' affection and loyalty to the organization could be measured by organizational commitment (Kanter, 1968).

Organizational culture has been described as "the glue that unites organizations" (Goffee and Jones, 1996). It is made up by the core values and beliefs of its members within, which affects one's job attitudes and behaviors, and also affects the individual's emotion towards the organization. The middle-level administrators at universities are the bridge connecting the universities and teachers, the internal sides, and external ones of the organization, they are not only the strategic executors of the universities, but also the communicators and departments leaders. Therefore, as the middle-level administrators at universities, their leadership plays an important role in stimulating teachers' job attitudes and behaviors. As a department leader, the middle-level administrators must also attach importance to the cultivation of teachers' values in university, which is the inner drive of human beings, for improving teachers' cognition of job satisfaction and teachers' emotion towards the organization (such as loyalty) through organizational culture.

Hence, the objective of this paper is to study the relationships among middle-level administrators' transformational leadership, teaching faculties' job satisfaction, organizational culture, and organizational commitment in the higher education sector in China. This paper will choose a sample of teaching faculties from medical universities in Guangxi, China. Therefore, the research question is whether there are relationships among middle-level administrators' transformational leadership, teaching faculties' job satisfaction, organizational culture, and

teaching faculties' organizational commitment. The benefit of this study is that management in medical universities in Guangxi will understand more insights regarding the relationships among middle-level administrators' transformational leadership, teacher's job satisfaction, organizational culture and organizational commitment; and the recommendations provided by this study would help the middle-level administrators to improve the transformation leadership and eventually the teachers' job satisfaction and organizational commitment.

Literature review

Transformational leadership (TL)

Transformational leadership (TL) is a style of leadership in which the leader recognizes the change needed, develops a vision to guide the change and conduct the change. This change is conducted through encouragement and inspiration, and with commitment of others. Actually, TL is about transformation and change. It focuses on changing the visions, missions, values, and performance to achieve effectiveness and quality in service delivery and product making (Gonfa, 2019). Gonfa (2019) indicates that TL could create a goal of future for the organization and affect its employees with strong emotions to support the goal. It requires the ability to inspire a common goal effectively and the leaders rally others around a common dream and enlisting others in seeing and moving toward the vision. Leadership, as a process of social influence, is indeed a common phenomenon in every country in the world, but its concept and composition may vary according to different national cultures (Hofstede, 1993). Therefore, Li and Shi (2005) establish a TL model, which is suitable to be used in the Chinese context, and includes four dimensions, namely morale modeling, charisma, articulate vision, and individualized consideration. It is found that the leadership process in China not only has something in common with the leadership process in western countries, but also has its own unique characteristics. For example, in terms of personalized care for employees, leaders in western countries mainly care about employees' work and personal development, whereas Chinese leaders also care about their employees' lives and families. Li and Shi (2005) state that TL in China also includes a unique dimension: morale modeling.

Job satisfaction (JS)

Barusman and Mihdar (2014) argue that job satisfaction (JS) refers to one's feelings, the negative and positive feelings towards work. Wright and Davis (2003) state that JS is someone's assessment of his work context which consists of work environment and job features. The above theoretical explanation suggests that Job Satisfaction is viewed as a positive or negative emotional state as a result of the employees' evaluation of the main characteristics of their job. When evaluating the level of JS, scholars and experts hold different views. Chen and Sun (1994) assess teachers' JS from two aspects: internal satisfaction and external satisfaction, among which internal satisfaction includes professional engagement, job nature and interpersonal

relationship, and external satisfaction includes satisfaction with policies, salaries, promotion and working conditions. Yuan, Xie and Xie (2006) divide teachers' Job Satisfaction into six areas, job nature, working environment and conditions, salary, further study and promotion, leadership and management, and interpersonal relationship. According to Li and Cheng (2007), JS consists of seven dimensions, job nature, job remuneration, promotion, interpersonal relationship, leadership behavior, organizational identity and work environment, and these seven dimensions are regarded as the basic structure to assess the JS of university teachers. Weiss et al. (1967) evaluate JS from intrinsic satisfaction and extrinsic satisfaction.

Organizational culture (OCul)

Organizational Culture (OCul) in management is to conduct the organizational rules for members of the organization to work together to achieve common goals (Nikpour, 2017). According to Lubis and Hanum (2020), Ocul is characterized by sharing of beliefs and values. It offers all employees in the organization with help and support. The reproduction of OCul is developed through the sharing of social knowledge in the organization, which is based on the norms, values, behaviors of the organizational members. OCul is influenced by a variety of social and personal factors and processes gradually over time and in relation to environmental uncertainties and differences. Sarros et al. (2005) adopt the following seven factors, supportiveness, innovation, competitiveness, performance orientation, stability, emphasis on rewards, and social responsibility, to measure the levels of Organizational Culture. According to Cameron et al. (2006), competing values framework (CVF) is employed to measure the OCul globally and is adopted in a wide variety of academic areas. CVF divides Organizational Culture into four types: clan, adhocracy, market, and hierarchy. Based on CVF framework, Denison and Mishra (1995) construct theoretical model of culture traits (TMCT), which can describe OCul traits. Denison's TMCT model reveals four cultural traits, namely involvement, consistency, adaptability, and mission.

Organizational commitment (OCom)

Kanter (1968) mentions that Organizational Commitment (OCom) is an individual's emotional loyalty to the organization and his intention to stay in the organization after weighing the benefits of staying in the organization and the costs of leaving the organization. Mowday, Steers and Porter (1979) define OCom as employees' recognition of organizational values and goals, which is an emotional dependence on the organization. It mainly includes the following three factors: (1) A strong belief and acceptance of organizational goals and values; (2) A willingness to make great efforts to achieve organizational goals; (3) A strong desire to remain a member of the organization. Meyer and Allen (1991) identify three dimensions of OCom: affective commitment (employees’ affection to stay with the organization), continuance commitment (employees weigh up the pros and cons of leaving the organization), and normative

commitment (employees feel a sense of obligation to the team).

Transformational leadership and organizational commitment (TL and OCom)

Allozi et al. (2022) argue that OCom is directly associated with the leadership capabilities that create a sense of recognition among employees, and the leadership also promotes a culture that aligns employee goals and perspectives with regard to the workplace. Therefore, TL is integral to employee retention as it generates a sense of belonging. Almutairi (2016) studies the relationship between TL and OCom. The results show a significant positive relationship between TL and OCom. Eliyana and Ma'arif (2019) focus on the antecedent variable of TL with its effect on work performance of the middle-level administrators at the organization of Pelabuhan Indonesia III Inc. It is revealed that organizational leadership style strongly affects employees' OCom. Jabbar, Mahmood and Qambar (2020) find that the TL has a positive impact on OCom of university teachers.

Following these research results, the first hypothesis can be written as follows:

H1: TL has a positive effect on OCom.

Transformational leadership and job satisfaction (TL and JS)

Atmojo (2015) finds that TL significantly affects JS. Liu，Dou and Sun (2014) show that the positive correlation between the two variables is significant. For the managers of enterprises, adopting the TL could certainly improve the JS of their employees (Shi, 2011). Zhao and Xi (2018) find that TL has a direct impact on teachers' JS. The teachers' satisfaction depends on the leadership of the principal to a great extent, and TL has a stronger influence on the teachers' satisfaction. Therefore, the following hypotheses can be drawn:

H2: TL has a positive effect on JS.

Transformational leadership and organizational culture (TL and OCul)

According to Stålhammar and Pedersen (2017), OCul should be changed according to the changes of internal and external environment of the organization, which is also the adaptability requirement of organizational culture. When the adaptability of OCul begins to weaken, leaders should strengthen or recreate OCul through changes according to the changes of the context. The context determines the culture that needs to be maintained or changed, but the strategies adopted are largely determined by the paradigm and perspective subscribed to by the change agent or the manager (Willcoxson and Millett, 2000). Leadership has an important impact on the creation, management and change of the OCul (Zhang, 2018). Once the leader's influence spreads, it means that the group has formed the will to obey the leader, and has identified and followed the leader's values, and then evolved into the common values of the group, with which the group behavior shows a high degree of convergence, and the OCul is created. The leaders' influence, the ideas

and behaviors of the individual together create the OCul. Therefore, the leadership style is closely related to the formation of OCul. Tipu, Ryan and Fantazy (2012) conduct the study on TL in Pakistan. The findings show that TL could predict OCul significantly. Cheng and Yu (2018) conduct a survey through 224 employees from enterprises and find out that TL has a significant positive impact on OCul.

Based on these results, the following hypothesis can be proposed:

H3: TL has a positive effect on OCul.

Organizational culture and job satisfaction (OCul and JS)

Many research papers have demonstrated the relationship between OCul and JS. For instance, Mansoor and Tayib (2010) indicate that there is a definite correlation between OCul and JS , and the employees' JS is negatively related to the hierarchical culture. According to Belias and Koustelios (2014), JS can be predicted by the employees' perception of OCul. Ilham (2018) finds that OCul significantly affects the JS. Soomro and Shah （2019) show that OCul has a significant and positive effect on JS. Therefore, another hypothesis can be drawn below:

H4: OCul has a positive effect on JS.

Job satisfaction and organizational commitment (JS and OCom)

The relationship among JS, OCom, and turnover intention are investigated by Aydogdu and Asikgil (2011). The results of the study support that (1) Affective commitment (dependent variable) is positively correlated with both internal JS and external JS; (2) Continuous commitment (dependent variable) is positively correlated with both internal JS and external JS; (3) Normative commitment (dependent variable) is positively correlated with both internal and external JS. Therefore, JS has a significant and positive relationship with OCom. Purnama (2013) believes that if JS is met, the employees will be more committed to the organization. The empirical study conducted by Ćulibrk, et al. (2018) finds that JS has a positive relationship with OCom. Based on these results, the following hypothesis can be proposed:

H5: JS has a positive effect on OCom.

Organizational culture and organizational commitment (OCul and OCom)

Purnama (2013 and Carvalho et al. (2018) prove that OCul influences the OCom positively and significantly. Aranki, Suifan and Sweis (2019) examine the relationship between OCul and OCom in IT Companies in Jordan. The research findings support a positive relationship between OCul and OCom. Therefore, organizations that attempt to improve their employees' commitment need to make extra effort to build a strong organizational culture. Azadi et al. (2013) study the relationship between OCul and OCom based on Denison's organizational culture model. The results show that there are significant positive relationships between OCom and all components of OCul including adaptability, involvement, adjustment,

and mission. Therefore, another hypothesis can be proposed as:

H6: OCul has a positive effect on OCom.

The mediating role of job satisfaction and organizational culture

Podsakoff et al. (1990) find that JS mediates the effects of TL on employee outcome variables, including organizational citizenship behavior. Shim, Lusch and O'Brien (2002) believe that leadership styles influence the managers' intrinsic and extrinsic JS, which ultimately influenced their OCom. Mohamad (2012) reveals that the relationship between perceived TL style and OCom is mediated by employee s' Job Satisfaction. Nguni, Sleegers and Denessen (2006) find that JS plays a mediating role in the effects of TL on OCom of teachers.

Berson, Da'as and Waldman (2015) suggest that learning atmosphere, shared vision and team trust play a complete mediation role between charismatic leadership and organizational performance. Burton and Peachey (2014) find that TL behavior can affect employees' emotional commitment to the organization through group culture. Shim, Jo and Hoover (2015) also confirm that the TL-commitment is fully mediated by group culture.

Based on the above literature results, two hypotheses can be proposed as follows:

H7: There is a significance mediating effect of JS on the relationship between TL and OCom.

H8: There is a significance mediating effect of OCul on the relationship between TL and OCom.

Conceptual framework

To summarize, there are four variables in this paper: TL, JS, OCul, and OCom. TL has four dimensions as propose by Li and Shi (2005): morale modeling, charisma, articulate vision, and individualized consideration. JS has 2 dimensions following Weiss et al. (1967) as intrinsic satisfaction and extrinsic satisfaction. OCul has 4 dimensions following Dension's model: involvement, consistency, adaptability, and mission. OCom has three dimensions following Meyer and Allen (1991): affective commitment, continuance commitment, and normative commitment.

All of the 4 variables and 8 hypotheses are displaced in Figure 1.

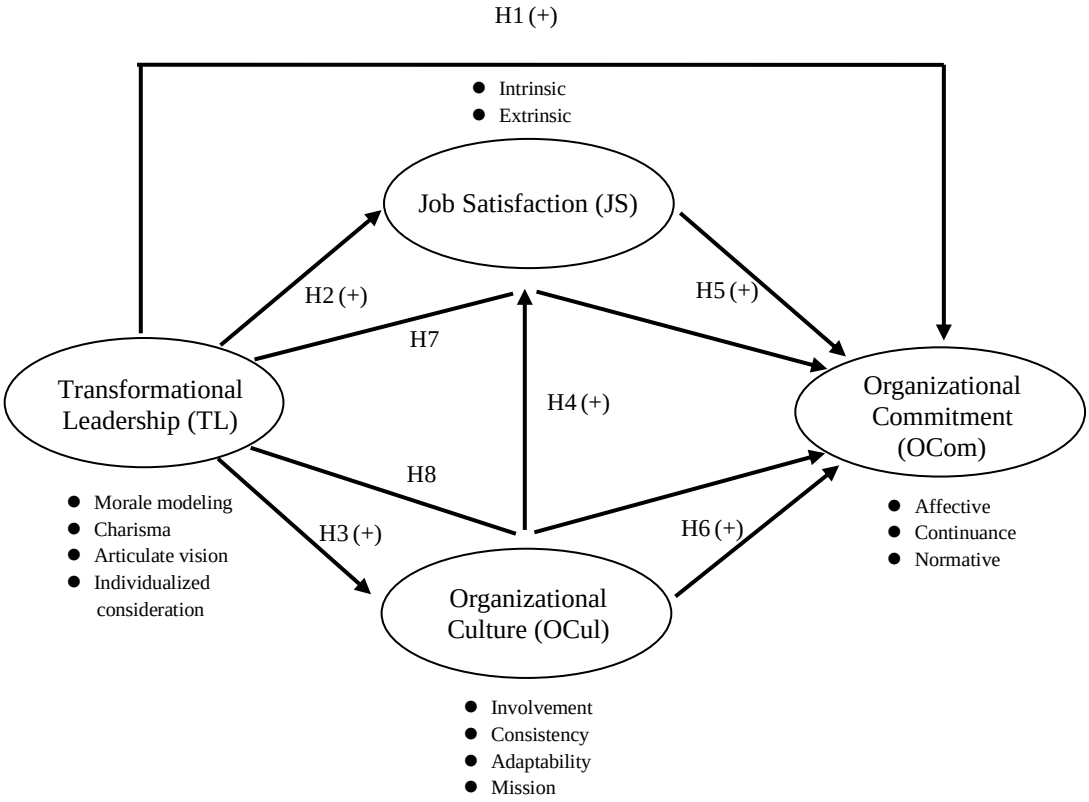


Figure 1 Conceptual framework

Research methodology

Research design

This paper employs the quantitative approach to study the relationships among TL, JS, OCul, and OCom of teachers at medical universities in Guangxi, China. Questionnaire is developed to collect the primary data. Hypotheses are tested by using structural equation modeling (SEM).

The target population of the study is the teaching faculties from all medical universities in Guangxi, China. There are total three medical universities in Guangxi: Guangxi Medical University, Guilin Medical University, and Youjiang Medical University for Nationalities. According to the Human Resources Departments of the three universities, there are total 2990 teaching faculties in record when the research is conducted.

Data collection

Following the Slovin's formula (Tejada and Punzalan, 2012), if the sampling error is chosen to be 5%, then the sample size should be minimum 353 (=2990/(1+2990*0.05^2). The data

collection was conducted online. First, letters of requesting the questionnaire survey were sent to the directors or deans of the three medical universities to get the approval. Then the questionnaire link was distributed through email and WeChat application to all teaching faculties in 3 medical universities. The participation of the respondents was on a voluntary basis and there were a total of 551 responses collected. After deleting 138 invalid responses, there were 166, 129, and 118 valid questionnaires collected form Guangxi Medical University, Guilin Medical College, and Youjiang Medical University for Nationalities, respectively. Thus, the final sample size is 413 for this study.

Empirical results

Confirmatory factor analysis

Table 1 shows the brief results of the confirmative factor analysis. TL, OCul, and OCom are second-order factors, it can be seen from Table 1 that standardized factor loading of each dimension is significant at 1% level after deleting the items with standardized factor loading lower than 0.5. JS is the first order variable, the standardized factor loading of each item is greater than the critical value of 0.60 and significant at 1% level.

Reliability test

It can be seen from the Table 1 that the Cronbach's α coefficients of TL, OCul, JS and OCom are 0.981, 0.963, 0.955 and 0.907 respectively. All Cronbach's α coefficients of four variables and their dimensions are greater than 0.8, which indicates that the questionnaire has high level of internal consistency following Nunnally (1978). The internal consistency of latent variables is evaluated by combined reliability. It can be seen from Table 1 that the composite reliability (CR) of each variable and dimension in this study is greater than 0.7, which shows that each variable in this study has high level of internal consistency according to the standard set by Fornell and Larcker (1981).

Table 1 Brief results of CFA, reliability and convergent validity

Variable and Dimensions	Standard factor loading	Cronbach's α	CR	AVE
Transformational Leadership (TL)		0.981	0.952	0.834
Morale modeling (TL_M)	0.88***	0.958	0.957	0.761
Charisma (TL_C)	0.96***	0.948	0.945	0.741
Articulate vision (TL_A)	0.91***	0.957	0.955	0.781
Individualized consideration (TL_I)	0.90***	0.966	0.966	0.827
Organizational Culture (OCul)		0.963	0.935	0.781
Involvement (OCul_I)	0.89***	0.893	0.889	0.617
Consistency (OCul_C)	0.89***	0.891	0.895	0.552
Adaptability (OCul_A)	0.94***	0.877	0.868	0.523
Mission (OCul_M)	0.82***	0.949	0.947	0.664
Job Satisfaction (JS)		0.955	0.963	0.610
Intrinsic (JS_I)		0.936	0.969	0.546
Extrinsic (JS_E)		0.866	0.904	0.611
Organizational Commitment (OCom)		0.907	0.782	0.571
Affective (OCom_A)	0.96***	0.869	0.785	0.542
Continuance (OCom_C)	0.89***	0.834	0.846	0.586
Normative (OCom_N)	0.80***	0.868	0.872	0.536

*Note: *** indicates significance at 1% level.*

Validity test

The average variance extracted (AVE) is used to measure the convergent validity of each variable. As shown in Table 1, the AVE values of each variable and dimension are between 0.523 and 0.834, i.e. all of them are greater than 0.5, which means that the convergent validity of the questionnaire is acceptable (Fornell and Larcker, 1981). The discriminant validity of the questionnaire is also tested. As shown in Table 2, the AVE arithmetic square root of each variable is greater than the correlation coefficient between this variable and other variable. Similar results can be seen in Table 3 that the AVE arithmetic square root of each dimension is greater than the correlation coefficient between this dimension and other dimension. Thus the questionnaire used in this study has good discriminant validity.

Table 2 Correlations and square roots of AVE of variables

Variable	TL	JS	OCul	OCom
TL	(0.913)			
JS	0.756**	(0.781)		
OCul	0.758**	0.755**	(0.884)	
OCom	0.660**	0.686**	0.751**	(0.756)

Note: 1. The diagonal value and the number in parentheses are the arithmetic square root of the AVE value.

*2. ** stands for $p < 0.01$.*

Table 3 Correlations and square roots of AVE of dimensions

	TL_M	TL_C	TL_A	TL_I	OCul_I	OCul_C	OCul_A	OCul_M	JS_I	JS_E	OCom_A	OCom_C	OCom_N
TL_M	**(0.872)**												
TL_C	0.743**	**(0.861)**											
TL_A	0.816**	0.814**	**(0.884)**										
TL_I	0.756**	0.788**	0.833**	**(0.909)**									
OCul_I	0.517**	0.590**	0.548**	0.560**	**(0.785)**								
OCul_C	0.706**	0.687**	0.692**	0.644**	0.697**	**(0.743)**							
OCul_A	0.518**	0.583**	0.554**	0.545**	0.745**	0.716**	**(0.723)**						
OCul_M	0.620**	0.701**	0.652**	0.608**	0.640**	0.708**	0.689**	**(0.815)**					
JS_I	0.602**	0.639**	0.638**	0.641**	0.566**	0.621**	0.601**	0.669**	**(0.739)**				
JS_E	0.642**	0.687**	0.711**	0.780**	0.600**	0.714**	0.583**	0.592**	0.757**	**(0.782)**			
OCom_A	0.438**	0.465**	0.480**	0.427**	0.546**	0.536**	0.491**	0.580**	0.567**	0.506**	**(0.736)**		
OCom_C	0.544**	0.630**	0.532**	0.514**	0.364**	0.625**	0.372**	0.501**	0.415**	0.493**	0.407**	**(0.766)**	
OCom_N	0.483**	0.528**	0.515**	0.507**	0.616**	0.605**	0.566**	0.608**	0.596**	0.564**	0.681**	0.376**	**(0.732)**

Note: 1. The diagonal value and the number in parentheses are the arithmetic square root of the AVE value.

*2. ** stands for $p < 0.01$.*

Correlations among four variables

It can be seen from Table 2 that the positive correlations between each pair of the 4 variables are all significant at 1 percent level. Therefore, the results can be stated that TL has a significant positive relationship with JS (0.756), OCul (0.758), and OCom (0.660); JS has a significant positive relationship with Ocul (0.755) and OCom (0.686); and OCul has a significant positive relationship with OCom (0.751).

Hypothesis testing

In this study, SEM is used to test the hypotheses among the four variables. The initial model can't fit the data well based on the indexes of fit. Thus, the model is modified by adding covariant relationship among error variables. It can be seen from Table 4 that all measured values of the modified SEM are satisfied by comparing to the reference values of all 6 different indexes of fit, i.e. χ^2/df, GFI, AGFI, NFI, CFI and RMSER (Medsker, Williams and Holahan, 1994). Then this modified SEM will be used to test the hypotheses.

Table 4 Matching results of modified SEM

Index of fit	χ^2/df	*GFI*	*AGFI*	*NFI*	*CFI*	*RMSEA*
Reference value	≤5	＞0.90	＞0.80	＞0.90	＞0.90	≤0.10
Measured value of the modified SEM	4.83	0.91	0.85	0.95	0.96	0.09

Table 5 Results of Hypotheses Testing

Hypothesis	Path	Path Coefficient	Standardized Path Coefficient	*P* value	Results
H1	TL→OCom	-0.070	-0.084	0.350	Not supported
H2	TL →JS	0.295	0.428	＜0.001	Supported
H3	TL→ OCul	0.637	0.823	＜0.001	Supported
H4	OCul→ JS	0.462	0.518	＜0.001	Supported
H5	JS→ OCom	0.344	0.285	0.017	Supported
H6	OCul→OCom	0.738	0.683	＜0.001	Supported

The results of the first six hypotheses are shown in Table 5.

H1: In the modified structural equation model, the regression coefficient between TL and OCom is -0.070 (β) (P = 0.350 > 0.05), which means the relationship between TL and teachers' OCom is not significant. That is to say, improving TL of middle-level administrators in medical universities in Guangxi could not improve teachers' OCom. Therefore, H1 in this study is not supported.

H2: In the modified structural equation model, the regression coefficient between TL and JS is 0.295 (β) (P < 0.001), which means TL of middle-level administrators in medical universities in Guangxi could significantly positively affect teachers' JS. The higher the TL, the higher the JS of teachers. Therefore, H2 in this study is supported.

H3: In the modified structural equation model, the regression coefficient between TL and OCul is 0.637 (β) (P < 0.001). That is, the TL of middle-level administrators in medical universities in Guangxi could significantly positively affect teachers' evaluation of OCul. The higher the TL, the higher the teachers' evaluation of OCul. Therefore, H3 in this study is supported.

H4: In the modified structural equation model, the regression coefficient between OCul and teachers' JS is 0.462 (β) (P < 0.001). The higher teachers' evaluation of OCul, the higher teachers' JS. Therefore, H4 in this study is supported. OCul has a significant positive effect on JS.

H5: In the modified structural equation model, the regression coefficient between teachers' JS and teachers' OCom is 0.344 (β) (P < 0.001). The higher the teacher's JS, the higher the teacher's OCom. Therefore, H5 in this study is supported. JS has a significant positive effect on OCom.

H6: In the modified structural equation model, the regression coefficient between OCul and teachers' OCom is 0.738(β) (P<0.001). The higher teachers' evaluation of OCul, the higher teachers' OCom. Therefore, H6 in this study is

supported. OCul has a significant positive effect on OCom.

Mediating effect

Bootstrap method is used to further test the mediating effect. The results in Table 5 show that the mediating effect of OCul and JS is significant. The mediating effect value is 0.673 and 95% confidence interval indicated by Bootstrap did not contain 0. The direct effect value of TL on OCom was -0.070 and Bootstrap indicated that 95% confidence interval contained 0, which shows that the direct effect of TL is not significant.

As shown in Table 6, the mediating effect is produced through three mediating chains: First, indirect effect 1 (the mediating effect value = 0.102) is caused by TL → JS → OCom. 95% confidence interval in Bootstrap does not contain 0, indicating that the mediating effect of JS is significant. Secondly, indirect effect 2 (the mediating effect value = 0.470) is caused by TL → OCul → OCom. 95% confidence interval in Bootstrap does not contain 0, indicating that OCul has a significant mediating effect. Thirdly, indirect effect 3 (the mediating effect value =0.101) was caused by TL → OCul → JS → OCom. 95% confidence interval in Bootstrap does not contain 0, which indicated that Ocul and JS play a significant role in the chain mediating TL and OCom.

Therefore, H7 (JS has a significant mediating effect in the relationship between TL and OCom.) is supported. And H8 (Ocul plays a significant mediating role in the relationship between TL and OCom.) is supported.

Table 6 The mediating role of OCul and JS in the relationship between TL and OCom

	Effect value	Lower limit of Boot CI	Up limit of Boot CI	*P* value	Effect ratio
Indirect effect 1 (TL → JS → OCom)	0.102	0.008	0.245	0.035	15.15%
Indirect effect 2 (TL → OCul → OCom)	0.470	0.301	0.675	0.001	69.84%
Indirect effect 3 (TL → OCul → JS → OCom)	0.101	0.017	0.204	0.027	15.01%
Total indirect effect (TL → OCom)	0.673	0.509	0.906	0.001	

Conclusion and discussion

Conclusion

This paper attempts to study the relationships among TL, JS, OCul, and OCom using a sample of 413 teaching faculties in medical universities in Guangxi, China. The SEM results reveal the following conclusion: TL has a significant positive effect on teachers' JS; TL has a significant positive effect on OCul; OCul has a significant positive effect on teachers' JS; Teachers' JS has a significant positive effect on teachers'

OCom; OCul has a significant positive effect on teachers' OCom; TL has no significant positive effect on teachers' OCom; however, JS and OCul are playing significant mediating role in the relationship between TL and OCom. Thus, it can be concluded that TL of middle-level administrators in medical universities in Guangxi has a significant positive effect on teachers' OCom via teachers' JS and OCul of the university.

Discussion

This study shows that TL has a significant positive effect on teachers' JS. This result is consistent with the findings of Atmojo (2015), Allozi et al. (2022), Shi (2011), Liu, Dou and Sun (2014), and so on. It is suggested that TL of middle-level administrators in medical universities in Guangxi is an important factor to stimulate teachers' JS. TL is also found to have a significant positive effect on OCul. This is consistent with the findings of Jati et al. (2015) and Cheng and Yu (2018). It indicates that TL of middle-level administrators in medical universities in Guangxi is an important factor influencing the OCul of universities. Chinese individuals have a strong cultural tendency of collectivism, and Chinese people tend to establish a close relationship between their organizational life and their own personal life. The group they belong to is regarded as a necessary part of their individual life, rather than making a clear distinction, and they have a strong intention to share a common destiny with the organization (Lu, Li and Li, 2010).

The result that OCul has a significant positive effect on teachers' JS is consistent with the findings of Soomro and Shah (2019) and Li (2020). This conclusion further confirms the research results of scholars in China and abroad on the impact of OCul on JS. Therefore, universities can improve teachers' satisfaction on their work by improving their recognition of OCul.

Teachers' JS is found to have a significant positive effect on teachers' OCom. This result is consistent with the findings of Ćulibrk, et al. (2018), Chen and Liu (2021), and Zhang and Mao (2022). Zhang and Mao (2022) show that the higher the level of teachers' JS, the higher the teachers' recognition of their current job and their organization, and the stronger their willingness to stay in their university. OCul is found to have a significant positive effect on teachers' OCom. This is consistent with the results of Nikpour (2017), Lin, Zhang and Zhao (2021), Chen and Liu (2021), and Zhang and Mao (2022). This conclusion further confirms that university OCul is an important factor affecting the level of teachers' OCom. This study suggests that the influence of TL of middle-level administrators in medical universities in Guangxi on teachers' OCom works via the mediating role of JS and OCul. It suggests that improving teachers' JS can effectively improve teachers' OCom Meanwhile, building a good university OCul can also improve teachers' OCom. This result is consistent with the findings of Burton and Peachey (2014) and Shim, Jo and Hoover (2015.

However, the paper finds that the relationship between TL and OCom is not clear-cut. Although TL and OCom are significantly positively correlated as shown in Table 2, but the addition of the two variables, JS and OCul, could lead to insignificant effect of TL on OCom. This could be explained by the context of

Chinese culture. Xu (2012) finds that the antecedents of OCom include at least four categories: social factors, individual factors, work factors and organizational factors. Zhang, Fan and Yan (2013) propose that in the context of Chinese culture, the formation path of sensitivity of OCom is from “emotion, trust” to “satisfaction for need of relationship”, finally to “OCom”.

Managerial implications

Based on the result that transformational leadership of middle-level administrators in medical universities in Guangxi has a significant impact on building university organizational culture, improving teachers' job satisfaction and organizational commitment, it is suggested that middle-level administrators need to set a good morale model for teachers, care for teachers’ individualized needs in life and work, put forward a clear future goals or mission for teachers and let them feel the important influence of their work on the college or university. Middle-level administrators are recommended to develop their own charms of leadership, such as democratic thinking, innovation, outstanding ability, enthusiasm for work and continuous learning, which could provide positive incentives for teaching faculties.

Since organizational culture and job satisfaction are found to have significant mediating effects on the relationship between transformational leadership and organizational commitment, it is recommended that middle-level administrators with the value of transformational leadership could share university values, beliefs, ideals, and other spiritual forms with teachers and develop vision incentives for teachers. By doing so, teachers can increase their recognition of the organizational culture of their universities. On the other hand, it helps to improve teachers’ awareness of their work value and improve teachers' job satisfaction, and teachers with high sense of organizational culture identity and job satisfaction could show higher level of organizational commitment. Therefore, middle-level administrators should improve their transformational leadership, the embodiment of good university organizational culture, which eventually improves teaching faculties’ job satisfaction and organizational commitment.

Limitation and future research

Geographically, China is a large country with a vast territory. However, the sample in this study is only from the medical universities in Guangxi Province in western China, so the regional representation of the sample is limited. Moreover, since this study is only for the higher education industry, the conclusions of this study can’t be generalized. Therefore, in future research, it is possible to further expand the industry fields and samples to carry out confirmatory research.

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