Research on the relation the characteristics of the faculty and the commitment to continuous improvement of motivations and student study processes

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Abstract This study focused on China's higher education system and explored if personality traits were a mediator of the relationship between motivational mechanisms and continuous improvement, and further explored if leadership change was a moderator of the relationship between personality traits and continuous improvement of the motivations and student study processes. In this paper, partial least squares (PLS) was the primary methodology used to test mediation and moderation. This study analysed 350 samples even though a large sample may cause an evaluative error in the mediation effect when using PLS. For this reason, we further adopted the Sobel test to verify this effect. According to the test results, in addition to motivational mechanisms having a positive effect on continuous improvement of the motivations and student study processes, personality traits are a mediator that influences the effect of motivational mechanisms on the continuous improvement of the motivations and student study processes. Furthermore, we proved that leadership change is a moderator between personality traits and continuous improvement of the motivations and student study processes. In addition, we discussed the relationship between mediation and moderation effects of different personality traits and leadership change.

Keywords Higher education · Mediator · Moderator · Continuous improvement

Introduction

To support economic development, ensuring the talent output quality of higher education institutions has become an important national policy in China. To support this goal, higher education institutions are attempting to implement total quality management. According to Shhney et al. (2004) and Asif et al. (2013), the implementation of total quality has a positive effect on improving the motivations and student study processes. By ensuring the quality of the motivations and student study processes, the talent output quality should also be ensured.

Motivation means that students are motivated to pursue the goals they value (Reynolds et al. 2014; Moussa 2015); the student study process is a process of inputting student learning motives and situations, complex learning processes, and learning performance outcomes (Biggs 1987; Biggs et al. 2001). When students are motivated, they will inject strong learning motives into the study process, with the outcome being a great learning performance. However, how do motivated students generate strong motives? Actually, the continuous improvement for student study processes may be one solution. Vogel et al. (2009) and Mercado et al. (2016) indicated that the improvement of the student study process can motivate student learning participation and can maintain strong learning performance. Therefore, the continuous improvement of the motivations and student study processes is a critical factor in maintaining the talent output quality; therefore, college managers have attempted to design a system to continuously control and revise these processes. However, the effect is limited. The largest problem is focusing academics' attention on continuous improvement. Evaluating the work intention of academics will determine whether the motivations and student study processes can be

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continuously improved. Therefore, more college managers are designing motivational mechanisms to increase academics' intention to engage in continuous improvement. In the design of motivational mechanisms, academics receive awards, including bonuses, honorary titles, public praise, or training, if they make a research breakthrough. These rewards can be applied to improve the motivations and student study processes to innovate the course design and teaching or to identify problems in the motivations and student study processes that may be improved. In addition, college managers also announce these rewards and achievements to all academics instead of awarding these benefits privately. To pursue rewards and achievements, an increasing number of academics are addressing the continuous improvement of the motivations and student study processes. Solomon et al. (2012), José Tarí et al. (2013), and Yee et al. (2013) indicated that using a motivational mechanism has a positive effect on increasing academics' intention to engage in continuous improvement.

However, college managers also encountered unexpected strange reactions from academics. First, certain academics are independent. These managers may intend to implement continuous improvement, but they may cease to do so because they value independence more than obtaining honour and achievement. Second, over the long-term, the success of the motivational mechanisms of honour and achievement may gradually decrease, as certain academics may initially be interested but eventually lose interest. Third, few academics have been enticed to improve motivations and student study process quality. However, complaints have increased, and motivational mechanisms are being questioned for their fairness; certain academics require more praise from motivation mechanisms, so these mechanisms may finally stop being used. Fourth and worst of all, the motivation for certain academics may be simply to obtain honours and achieve recognition; however, they do poor work that somehow continues to appear to have a positive effect on the continuous improvement of the motivations and student study processes.

The problems shown above are usually ascribed to past motivational mechanism design errors; therefore, the related research such as that by Victor and Babatunde (2014) indicates that an improved motivational mechanism design can address these phenomena.

Although motivational mechanisms are repeatedly revised, the above phenomena always occur. Over time, an increasing number of college managers have begun to ask if the problem is caused by different personality traits, and they wonder whether personality traits are a mediator that affects the effect of motivational mechanisms on the continuous improvement of the motivations and student study processes. Actually, the impressions of the college managers may be correct. According to Harris et al. (2014),

Ameh and Odusami (2014), and Dedeoğlu and Demirer (2015), personality traits determine individual cognitive behaviour. Based on different personality traits, people may react differently when confronted with the same problem or situation. Therefore, personality traits may be a mediator that affects the relationship between motivational mechanisms and continuous improvement, although the existing research continues to lack an empirical test result to prove this relationship.

Additionally, if the effect of personality traits exists, college managers should consider how to decrease the impact of personality traits on continuous improvement. According to the relevant literature, a leadership change can be a moderator that decreases the effect of personality traits. Felfe and Schyns (2014) and Corr et al. (2013) indicated the existence of an interaction between leadership behaviour change and personality traits. This finding means that the managers should adopt a divergent attitude or different managerial behaviours based on different academics' personality traits to communicate and further ensure the positive effect of motivational mechanisms on continuous improvement. However, the existing studies lack an empirical test to prove whether a leadership change can moderate the effect of personality traits.

Based on the above discussion, this study focuses on China's higher education system to explore the mediation effect of personality traits on the relationship between motivational mechanisms and continuous improvement, and to further explore the moderation impact of leadership change on personality traits. Our research model is presented in Fig. 1.

Method

Research hypotheses

From Fig. 1, three hypotheses should be established and further explored:

H1 Motivational mechanisms are positively associated with the continuous improvement of the motivations and student study processes.

Fig. 1 Research model

H2 Personality traits positively mediate the improvement effect of motivational mechanisms on the continuous improvement of the motivations and student study processes.

H3 Leadership change positively moderates the effect of personality traits on the continuous improvement of the motivations and student study processes.

Improvement effect of motivational mechanisms on the continuous improvement of the motivations and student study processes

According to the relevant literature, we found that previous studies explored the effect of motivational mechanisms on the continuous improvement of motivations and student study processes in higher education and proved that motivational mechanisms do have an effect. However, why do motivational mechanisms have a positive effect on continuous improvement? De Lourdes Machado-Taylor et al. (2016) and Rikkerink et al. (2016) indicated that academics are a key resource in higher education, and a well-developed motivational mechanism can usually attract academics to contribute to an excellent teaching or research environment; thus, a motivational mechanism certainly has a positive effect on the continuous improvement of higher education quality. In addition, according to Asif et al. (2013), Aminbeidokhti et al. (2016), and Chen et al. (2014), a suitable motivational mechanism will improve the education process quality. Therefore, motivational mechanisms have a positive effect on the continuous improvement of higher education quality. Thus, we propose *H1*.

Personality traits positively mediate the effect of motivational mechanisms on the continuous improvement of higher education quality

According to Senler and Sungur-Vural (2013) and Xiao and Wilkins (2015), academics' personality traits in higher education can usually be measured by the big five personality traits. The big five personality traits described by Costa and McCrae (1992), Tupes and Christal (1992), Lounsbury et al. (2007), Salleh et al. (2014), DeYoung (2015), and DeYoung et al. (2016) include the following: neuroticism, which is the opposite of emotional stability and reflects academics' emotional reaction when they experience something positive or negative; extraversion, which describes academics who may tend to be sociable and strive to achieve high performance; openness, an attribute that shows an active imagination and independence; agreeableness, which describes academics who are characterised by trust, altruism, reputation, or modesty; and

conscientiousness, which describes academics who are fair, reliable, systematic, or dutiful.

People may appear to think differently based on different personality traits. Therefore, according to Komarraju et al. (2011), Bjørnebekk et al. (2013), Csikszentmihalyi and Wong (2014), and Bozanoğlu and Sapancı (2015), personality traits may mediate the improvement effect of motivational mechanisms on the continuous improvement of the motivations and student study processes. Academics may think differently about motivational mechanisms due to differences among their personality traits. Different thinking styles drive academics to have different attitudes about the motivational mechanism; therefore, they may exhibit different behaviours or reactions (Rahman 2014; Zhang 2015), which affects the improvement effect of the motivational mechanism. Thus, we propose *H2*.

Leadership change moderates the effect of personality traits on the continuous improvement of the motivations and student study processes

In this study, leadership change is defined as a leader adjusting management behaviour according to different situations to accommodate staff who have different personality traits (Tiernay 2015; Leo and Wickenberg 2013). However, why does a leadership change moderate the effect of personality traits? Different personality traits are a fact of life (Keogh 1992). Therefore, it is normal that academics have different opinions and needs with respect to motivational mechanisms (Murnieks et al. 2014; Song and Chathoth 2013). Occasionally, academics exhibit different attitudes and behaviours when college managers use the same communication approach to improve the motivational mechanism. Therefore, college managers should change their attitude or behaviour to guide, improve, and explain when interacting with academics with different personality traits. Related studies such as those by Xu et al. (2013), Khumalo (2015), and Danisman et al. (2015) proved that a leadership change based on different personality traits has a moderation effect on these traits. Thus, we propose *H3*.

Methodology

Questionnaire construction, data collection, and sample profile

To test the research model, this study attempted to develop an efficient questionnaire. We considered the research purpose, model, and hypotheses and cited related literature to design four constructs: motivational mechanism (MM), which uses seven items to assess the construct; personality trait (PT), which assesses the construct using five items;

leadership change (LC), in which we design four items to assess the construct; and continuous improvement of the motivations and student study processes (CI), in which we also design four items to assess the construct. Constructs,

citation sources for the design elements, operationalisation, and scale items are listed in Table 1. Data were collected using five-point Likert scales ranging from “strongly disagree” (1) to “strongly agree” (5).

Table 1 Constructs of the questionnaire

Constructs	Scale items	Citation source	Operationalisation
MM	Which motivational items would you work to achieve. M1. Material award M2. Given senior academy title M3. Given leader title M4. Given chance for advanced studies M5. Given sabbatical M6. Given praise and honour title M7. Given spiritual motivation	Akuoko (2012), Yuan et al. (2006), Chen and Li (2005), and Lanfen (2003)	Academics will work to improve student study quality to obtain honour and achievement.
PT	Evaluate your personality traits. P1. Have significant emotional reaction when faced with success or failure P2. Tend to be sociable and prefer to work positively to achieve high performance P3. Usually have an active imagination and independence P4. Am characterised by trust, altruism, reputation, or modesty P5. Adopt an attitude of being fair, reliable, systematic, or dutiful in my work	Komaraju et al. (2011), Senler and Sungur-Vural (2013), and Xiao and Wilkins (2015)	Academics’ personal attitudes, reactions, or characteristics.
LC	Do you agree the college managers should adopt the following attitude towards you? L1. Managers should be responsible individuals who care and encourage improvement of your research or teaching L2. Managers should be positive when describing and explaining management policy and should guide academics to understand the purpose of the policy L3. Managers should change their attitude when communicating with academics with different personality traits L4. Managers should not maintain a rigid style when encountering different situations, problems, or faculty	Xu et al. (2013), Khumalo (2015), and Danişman et al. (2015)	In this study, leadership change is identified as a leader adjusting management behaviour according to different situations and to communicate with staff with different personality traits
CI	Which one do you usually adopt for continuous improvement of student study process quality? C1. Respond and revise immediately when a problem in the student study process appears C2. At regular intervals, innovate the teaching approach C3. Think and discuss the student study process and keep exploring potential problems C4. Research results implemented for the student study process to improve student study quality	Shhney et al. (2004) and Asif et al. (2013)	Academics will adopt an improvement approach to maintain the total quality of higher education

During data collection, this study surveyed colleges in Zhejiang Province in China. In total, 74 colleges are established in the Zhejiang Province. Considering the research purpose, this study will investigate the vice president, dean of academic affairs, head of the teaching centre, and vice dean of teaching institutes. These academics total 500; therefore, the questionnaires were sent to these academics. However, to control the margin of error of investigating to below 3%, how many academics need to take this survey? Actually, the statistics field has provided a formula to calculate the minimal requirement of the sample size as follows.

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}.$$

At the confidence level of 0.95, the sample size should be over 345, which is suitable and reasonable. We received 350 responses, for a 70% response rate; thus, the sample size has satisfied the minimal requirement. In the sample profile, 9.4% are professors, and 32.3% are associate professors, 44.3% are assistant professors or senior lecturers, and 14% are teaching assistants. We used ANOVA to test for significant differences in the four sample groups. In the ANOVA, a significance level = 0.05 is usually adopted to measure significant differences. The concept of a significant level was from Fisher's publication in 1925; he believed that the significance level = 0.05 had robustness in the measurement of significant differences. With more researchers such as Nickerson (2000) and Berger (2003) attempting to argue the concept of Fisher, they all agree the usage of the significance level = 0.05 is reasonable. Therefore, when the significant difference is 0.05, the results of p value under a significance level of 0.05 mean a significant difference exists, whereas a result higher than 0.05 means no significant difference exists. The test results indicated a p value > 0.05, which is over the threshold; this means that there is no significant difference among the four sample groups.

Normality and research methods

To ensure the research quality and results, the samples should be tested and verified for normality. In this study, five methods, including mean, standard deviation, variance, skewness, and kurtosis, were adopted. The test results are shown in Table 2, and these samples match the requirement of normality. This finding also means that we will use seven items including "material award", "given senior academy title", "given leader title", "given chance for advanced studies", "given sabbatical", "given praise and honour title", and "given spiritual motivation" to assess the motivational mechanism (MM). Five items

including "have significant emotional reaction when faced with success or failure", "tend to be sociable and prefer to work positively to achieve high performance", "usually have an active imagination and independence", "am characterised by trust, altruism, reputation, or modesty", and "adopt an attitude of being fair, reliable, systematic, or dutiful in my work" are adopted to assess personality traits (PT); four items including "managers should be responsible individuals who care and encourage improvement of your research or teaching", "managers should be positive when describing and explaining management policy and should guide academics to understand the purpose of the policy", "managers should change their attitude when communicating with academics with different personality traits", and "managers should not maintain a rigid style when encountering different situations, problems, or faculty" are adopted to assess leadership change (LC), and four items including "respond and revise immediately when a problem in the student study process appears", "at regular intervals, innovate the teaching approach", "think and discuss the student study process and keep exploring potential problems", and "research results implemented for the student study process to improve student study quality" are used to assess the continuous improvement of the motivations and student study processes.

In the research method, we used partial least squares (PLS) to evaluate the relationship between the research model and hypotheses. Sosik et al. (2009) stated that PLS is an excellent method to evaluate mediation and moderation. Actually, PLS generates estimates of standardised regression coefficients for model paths, which can then be used to measure the relationship between latent variables (Wold, 1985). The PLS analysis was performed using SmartPLS 3.0. However, Hayes (2009) found that large samples may cause an error in evaluating the mediation effect when PLS is used for testing. For this reason, we used the Sobel test to further verify the results of PLS and to verify the mediation effect. In the Sobel test, a free tool from Preacher and Leonardelli was adopted. Preacher and Leonardelli designed a tool to easily calculate for the Sobel test and provided it on the World Wide Web (<http://quantpsy.org/sobel/sobel.htm>). Any researcher that have raw data from PLS can insert the data into the tool on the web for further calculations.

However, before using PLS to test the research hypotheses, we needed to test the constructs for validity and reliability. In the test, the construct validity, the composite reliability (CR), the average variance extracted (AVE), and Cronbach's α are the primary indices. The construct validity is the factor loading, and all factors loading from that same factor should exceed 0.5 (Hasan and Ali 2007). In addition, CR and AVE should exceed the

Table 2 The results of the normality distribution

Constructs	Scale items	Mean	Standard deviation	Variance	Skewness	Kurtosis
MM	M1	3.72	1.12	1.26	−0.560	−0.687
	M2	3.29	1.19	1.43	−0.193	−1.012
	M3	2.93	1.09	1.20	0.024	−0.675
	M4	3.34	1.15	1.33	−0.306	−0.772
	M5	3.28	1.13	1.28	−0.172	−0.775
	M6	3.38	1.11	1.24	−0.355	−0.565
	M7	3.60	1.06	1.12	−0.531	−0.346
PT	P1	2.61	0.63	0.39	−0.043	−0.079
	P2	3.14	0.49	0.24	0.002	−0.035
	P3	2.73	0.49	0.24	−0.102	0.336
	P4	3.91	0.56	0.32	−0.184	0.059
	P5	3.63	0.58	0.33	−0.117	0.681
LC	L1	4.01	0.84	0.71	−0.586	0.065
	L2	4.21	0.68	0.46	−0.375	−0.400
	L3	4.32	0.69	0.48	−0.803	0.505
	L4	4.39	0.68	0.46	−1.051	1.426
CI	C1	3.97	0.86	0.73	−0.734	0.371
	C2	4.02	0.84	0.70	−0.757	0.760
	C3	4.09	0.76	0.57	−0.848	1.366
	C4	4.12	0.82	0.67	−1.060	1.649

Table 3 Measurement of constructs' validity and reliability

Constructs	Scale items	Factor loading	AVE	C.R.	Cronbach's α
MM	M1	0.680	0.545	0.893	0.863
	M2	0.808			
	M3	0.692			
	M4	0.760			
	M5	0.696			
	M6	0.770			
	M7	0.772			
PT	P1	0.790	0.386	0.719	0.832
	P2	0.822			
	P3	0.779			
	P4	0.859			
	P5	0.567			
LC	L1	0.730	0.609	0.861	0.800
	L2	0.767			
	L3	0.856			
	L4	0.764			
CI	C1	0.683	0.632	0.872	0.778
	C2	0.849			
	C3	0.849			
	C4	0.791			

0.7 and 0.5 thresholds recommended by Hair et al. (2011), and Cronbach's α should exceed 0.7.

All test results are provided in Table 3. According to Table 3, factor loading from every construct exceeded 0.5.

Although the majority of AVE and CR values of these constructs satisfy the requirements of Hair et al. (2011), we continued to find that the AVE of the personality traits is smaller than 0.5. However, the CR exceeds 0.7; thus, the

measurement model possessed acceptable convergent validity. Regarding the reliability, Cronbach's α from every construct exceeded 0.7; thus, the reliability of 4 constructs is also accepted.

Results

We used PLS to test our research hypotheses. Hair et al. (2011) recommend using 5000 sub-samples and the bootstrapping procedure to test the statistical significance of each path coefficient. Using the path coefficient, we can verify the mediating effect of personality traits. In addition, the product-indicator approach was adopted to detect the moderating effect of leadership change. To judge the significant differences for the path coefficient, we use the significance level of 0.05 to measure.

Based on the above, this study obtained the results shown in Fig. 2. According to Fig. 2, hypothesis 1 was supported. According to the test results, the path coefficient between the motivational mechanisms and the continuous improvement of the student study process is 0.229, and the p value of hypothesis 1 is 0.000, which is lower than 0.01; this means the test result has significance. This finding means that an improvement in the motivational mechanisms has a positive effect on the continuous improvement of motivations and the student study processes.

Figure 2 also shows the result of evaluating the mediating effects of personality traits. As shown in Fig. 2, we found that personality traits had a mediation effect on the motivational mechanisms. The coefficient between motivational mechanisms and personality traits was 0.180, and the p value is 0.002, which is lower than 0.05; this means the test result has significance. In addition, the coefficient between personality traits and continuous improvement of motivations and student study processes was 0.245, and the p value is 0.000, which is also lower than 0.01; this means the test result has significance. Thus, we can prove the mediation effect of personality traits exists and that hypothesis 2 was supported. To verify the test results, we used the Sobel test. In the Sobel test, the results of which are shown in Fig. 3, the p value is 0.012, which is higher than 0.01 but is lower than 0.05; this means the test result

Fig. 2 The results of PLS. * p value < 0.05, ** p value < 0.01

Input:	Test statistic:	Std. Error:	p-value:
a 0.180	Sobel test: 2.50101252	0.01763286	0.01238388
b 0.245	Aroian test: 2.45670368	0.01795088	0.01402183
s _a 0.058	Goodman test: 2.54780868	0.01730899	0.01084019
s _b 0.058			
	Reset all	Calculate	

Fig. 3 The Sobel test results. * p value < 0.05, ** p value < 0.01

has significance. Therefore, the mediation effect of personality traits certainly exists.

Finally, the results of PLS also examine the moderating effect of leadership change. In the moderating effect, three relationships between constructs should be examined, including the following: (a) the direct effect of personality traits on the continuous improvement of the student study process, (b) the direct effect of leadership change as a moderator of the continuous improvement of the student study process, and (c) the effect of the interaction between personality traits and leadership change on the continuous improvement of the student study process. The moderating effect should be confirmed by the significance of the interaction effect (c), direct effect (a), and effect (b). According to the test results, the coefficient of (a) is 0.245, and the p -value is 0.000, which is lower than 0.01; this means the test result has significance. The coefficient of (b) is 0.225, and the p -value is 0.000, which is lower than 0.01; this means the test result has significance. The coefficient of (c) is -0.133 , and the p -value is 0.006, which is also lower than 0.01; this means the test result has significance. This finding means that leadership change was found to positively moderate the relationship between personality traits and the continuous improvement of the student study process. Thus, hypothesis 3 is supported.

Discussion

Personality traits as mediators

Our empirical test results indicated that personality traits have a mediating effect on the relationship between improved motivational mechanisms and the continuous improvement of the student study process. However, why do personality traits have a significant mediation effect? Although many researchers in the quality management field hailed the effect of motivational mechanisms on continuous improvement, the results from Judge and Ilies (2002) indicated that the mediation effect of personality traits had a significant effect on the improvement of motivational mechanisms. Judge and Ilies explored the relationship between motivational mechanisms and personality traits based on 65 studies. These studies did not explore the institution of higher education; however, in

every industry, the improvement of motivational mechanisms must be affected by people's personality traits.

Why, exactly, are personality traits a mediator? In the theory of personality traits, the 'trait' is the core focus. A trait can drive people's individual thinking and behaviour, and different traits usually drive different individual thinking and behaviours. Occasionally, an issue may appear easy to understand and positive; however, certain people are complicated or engage in negative thinking (Chi et al. 2015; Debusscher et al. 2016). Additionally, people's traits are difficult to change. Trait development occurs through people's growth processes and life experiences (Roberts et al. 2006; Lüdtke et al. 2011); therefore, personality traits are ingrained. Therefore, people must modify their thinking and behaviour when they encounter changes or improvements. Thus, we can infer that personality traits must be a mediator that affects the motivational mechanisms on the continuous improvement of the student study process.

Leadership change as a moderator

As the test results show, this study found that leadership change is a moderator and has a significant positive effect on personality traits. However, to determine why leadership change is a moderator, we discuss how traits are developed. Psychologists such as Shiner and DeYoung (2013) and Miyajima et al. (2014) believed that there is a relationship between personality traits and temperament. This finding means that personality traits may improve temperament development. According to Keogh (1992), temperament usually affects academics' habits and acceptance. Therefore, college managers should adopt different management behaviours to communicate with academics with different personality traits. Thus, it will not be difficult to communicate with academics who have different personality traits; however, it is necessary to use the appropriate communication approach, attitude, or skill based on the traits of the staff member.

Based on the above, leadership change certainly plays an important role as a moderator. According to Miller (2001), strong leadership is central to successful, major change. Antonakis et al. (2012) further indicated that leadership needs to change based on individual differences, which decreases the overall effect of individual differences and improves management performance.

Therefore, college managers should observe academics' personality traits to understand which traits may mediate the positive impact of motivational mechanisms on the continuous improvement of the student study process; they should further determine the appropriate approach, attitude, or management behaviour for communication to reduce negative effects. To further prove the above results, this

study designed and included questions to investigate the personality traits of the questionnaire respondents. This study refers to the concept of the big five personality traits from Tupes and Christal (1992), Komarraju et al. (2011), Grevenstein and Bluemke (2015), and Thimm et al. (2016) who used the 25-item version of the Big Five Inventory (BFI). The questionnaire results were measured using a five-point Likert scale, ranging from (1) to (5), as shown in Table 4.

According to Table 4, this study further tested the mediation effect for each personality trait. The study tested which trait was a mediator for the relationship between motivational mechanisms and the continuous improvement of the student study process. We also explored whether leadership change was a moderator when someone had a mediator trait. The test results shown in Table 5 indicate that traits, including 'extraversion' and 'agreeableness', significantly affect the improvement of motivational mechanisms on continuous improvement. Leadership change is certain to become a moderator when traits mediate the improvement of the motivational mechanism. These test results also support our research hypotheses.

Table 4 Questionnaire based on the big five personality traits

Personality traits	Question: please evaluate yourself on each trait
Neuroticism	Become angry easily
	Become irritated easily
	Have frequent mood swings
	Often feel blue
	Panic easily
Extraversion	Do not talk a lot
	Find it difficult to approach others
	Know how to captivate people
	Make friends easily
	Take charge
Openness	Am full of ideas
	Avoid difficult reading material
	Carry the conversation to a higher level
	Spend time reflecting on things
	Will not probe deeply into a subject
Agreeableness	Am indifferent to the feeling of others
	Inquire about others' well-being
	Know how to comfort others
	Love children
	Make people feel at ease
Conscientiousness	Am exacting in my work
	Continue until everything is perfect
	Do things according to a plan
	Do things in a half-way manner
	Waste my time

Table 5 The mediation and moderation effect for each personality trait

Personality traits	Path	Path coefficient	Standard deviation	<i>p</i> value	Sobel test for mediator
Neuroticism	MM → CI	0.288	0.052	0.000**	0.888
	MM → neuroticism	−0.011	0.077	0.886	
	Neuroticism → CI	0.068	0.089	0.440	
	Neuroticism × LC (Moderator)	0.013	0.053	0.806	
Extraversion	MM → CI	0.240	0.058	0.000**	0.019*
	MM → extraversion	0.179	0.062	0.004**	
	Extraversion → CI	0.215	0.054	0.000**	
	Extraversion × LC (moderator)	−0.101	0.048	0.037*	
Openness	MM → CI	0.296	0.052	0.000**	0.535
	MM → openness	−0.112	0.137	0.412	
	Openness → CI	0.107	0.112	0.338	
	Openness × LC (moderator)	−0.011	0.073	0.879	
Agreeableness	MM → CI	0.237	0.056	0.000**	0.021*
	MM → agreeableness	0.174	0.057	0.002**	
	Agreeableness → CI	0.200	0.057	0.000**	
	Agreeableness × LC (moderator)	−0.100	0.046	0.032*	
Conscientiousness	MM → CI	0.264	0.055	0.000**	0.241
	MM → conscientiousness	0.090	0.072	0.215	
	Conscientiousness → CI	0.194	0.057	0.001**	
	Conscientiousness × LC (moderator)	−0.089	0.055	0.107	

* *p* value < 0.05, ** *p* value < 0.01

Conclusion

To verify the positive effect that motivational mechanisms have on continuous improvement of the motivations and student study processes and further improve the total quality of college, the purpose of this study was to explore the mediation effect of personality traits and further explore whether leadership change can be a moderator to decrease the effect of personality traits.

Based on the test results, we proved that personality traits mediate the improvement effect of motivational mechanisms on continuous improvement of the motivations and student study processes. Additionally, we also found that leadership change can decrease the effect of personality traits. In addition, we tested for each personality trait and determined which traits are a mediator that affects the improvement of motivational mechanisms. We also explored whether leadership change will have a moderation effect when some traits mediate the improvement effect of motivational mechanisms. The test results not only prove that the traits of ‘extraversion’ and ‘agreeableness’ are mediators but also found that leadership change will be a moderator when some traits mediate the improvement effect of motivational mechanisms.

Based on test results, this study discussed the effect of personality traits from a psychological perspective and

assumption that personality traits are human behaviours that are difficult to change. We thoroughly discussed the necessity for leadership change and proved that leadership change has a positive effect on decreasing the effect of personality traits. Our research results provide a guide to college managers. College managers understand the relationship between motivational mechanisms and continuous improvement of the motivations and student study processes. Although motivational mechanisms may provide honour and achievement, academics with some personality traits may not desire this recognition. Therefore, college managers should consider changing their communication approach, attitude, and management behaviours to decrease the effect of personality traits, to strengthen the relationship between motivational mechanisms and continuous improvement of the motivations and student study processes, and to further maintain the overall quality of higher education institutions.

This research was limited to samples from colleges of the Zhejiang Province in China. Thus, a broader range of samples should be included in future research. In addition, this study only focused on exploring personality traits as mediators and leadership change as a moderator. Future research should further explore which management behaviour changes have a positive effect and decrease the impact of certain personality traits.

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