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The Effect of Classroom Climate on Academic Motivation Mediated by Academic Self-Efficacy in a Higher Education Institute in China

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Abstract. Learning theories and empirical findings have widely recognized academic motivation as the driving force behind student academic performance. However, recent findings have indicated the need to pay attention to drive academic motivation among undergraduate students in China. Therefore, this present study examines the direct and indirect effects of classroom climate on student academic motivation in higher education. A total of 119 undergraduate students from a medical college in China was approached to respond to a survey questionnaire. The data analysis result shows that classroom climate significantly and positively affects student academic motivation and that the relationship is significantly mediated by academic self-efficacy. Particularly, the relationship established in this study additionally indicates that a planned and cohesive classroom climate can effectively improve student academic motivation. Indicatively, a planned and fair classroom climate effectually builds students' self-efficacy in their learning. This study highlights the indispensable and pivotal role that a positive classroom climate plays in motivating students to be more engaged and learn effectively. Also, the findings of this study provide guidance and references for stakeholders, school administrators, and lecturers in building and sustaining a positive and healthy classroom climate for better learning.

Keywords: Classroom Climate; Academic Motivation; Academic Self-Efficacy; Academic Performance

1. Introduction

Learning theories like Self-determination Theory (Deci & Ryan, 1985) and Self-worth Theory (Covington, 1992), as well as empirical researches, have clearly posited the crucial role that academic motivation plays in facilitating students' academic performance (Bailey & Phillips, 2016; Cleary & Kitsantas, 2017; Froiland & Worrell, 2016; Ladd & Sorensen, 2017). Effective learning process relies upon the triggering of academic motivation (Deci & Ryan, 2000). Students who find interest, value, and enjoyment in the learning process, indicate more engagement and persistence in learning activities (Pelletier, Fortier, Vallerand & Brière, 2001; Ratelle, Guay, Vallerand, Larose & Senécal, 2007). Consequently, strongly motivated students exert more effort to complete tasks (Wolters, 2004), and display higher levels of academic achievement (Mega, Ronconi & De Beni, 2014; Supervia & Bordas, 2018). Evidently, the role of motivation in learning is heavily documented; however, the complexity and breadth of the notion of motivation requires an introspective lens using classroom climate and self-efficacy.

It is quite disturbing that researches have revealed a low level of academic motivation among undergraduate students (Gao & Gao, 2015; Liu, 2013; Qiu, 2013), especially among science students in China (Gou, 2016; Zhao, 2015). In addition, only 45 percent of undergraduate students conveyed that they only focused on their studies in professional course classes. When it came to the selective course classes, the percentage declined to 18 percent (Wang & Lin, 2018). This could be explained by the disconnection between the instructional goals employed in undergraduate courses and the classroom climate, which could have an influence on the academic and developmental motivation of learners (Lerdpornkulrat, Koul & Poondej, 2018). Instructional strategies are not sufficient to drive motivation (Wang & Lin, 2018) since motivation is individual-driven. Therefore, personal factors like self-efficacy could be a potential factor in improving students' motivation through the classroom environment.

Among various school factors, preceding studies tend to investigate the well-known effects of teachers on students' academic motivation (Maulana, Helms-Lorenz, Irnidayanti & van de Grift, 2016; Saggaf, Nasriyah, Salam & Wirawan, 2018); however, limited information is offered to explain the effects of classroom climate on student academic motivation and how the effect happens in higher education setting in China. In a systematic review of literature on the effects of classroom climate, Wang, Degol, Amemiya, Parr and Guo (2020) established the abundance of studies relating a positive learning environment with psychological well-being of students; however, it was noted that a great deal of these studies were centered on young learners as they cited the need to further examine this relationship in the higher education setting particularly in Asian countries. In response to this, an analysis of the relationship between classroom climate, academic self-efficacy, and students' motivation could establish the need to build and sustain a positive learning environment in higher education institutions in China.

Recent research conducted by Huang and Bai (2017) has found the positive influence of classroom climate on undergraduates' academic motivation and the

mediating effect that self-efficacy exerts in their relationship. However, Huang and Bai (2017) did not take into account other factors regarding classroom climate except for classmate relation and teacher support, nor did they test the reliability and validity of the research instrument, which makes the findings questionable. Thus, this study presents a specific and validated illustration of the relationship among classroom climate, student academic motivation, and self-efficacy in the context of undergraduate medical students in China. On the strength of the above mentioned theoretical and empirical research approaches, three research questions are formulated for the present study:

1. How are perceived classroom climate and academic self-efficacy related to student academic motivation?
2. Which dimension of perceived classroom climate significantly predicts student academic motivation and academic self-efficacy?
3. Does academic self-efficacy have a mediating effect on the relationship between classroom climate and student academic motivation?

2. Literature Review

Self-determination Theory

This study takes Self-determination Theory (SDT) as an approach to understand student motivation in the classroom context. SDT presents a remarkable framework based on several motivation theories to understand the reciprocity of sociocultural conditions and individual personality (Deci & Ryan, 2008). Besides the conceptualization of motivation from external to internal, SDT also emphasizes the concept of basic psychological needs. SDT theorists believe that three internal psychological needs in human nature need to be met through interaction with the environment: autonomy or the desire to establish inner coherence and to feel self-directed; competence or the needs to feel confident in one's interactions with the social environment through exercising and expressing one's abilities; relatedness or the desire to feel integral and connected with others (Deci & Ryan, 1985; Ryan, Rigby & Przybylski, 2006). Accordingly, the environment that satisfies or fulfils students' basic needs is predicted to support their self-motivation, engagement, and well-being. In organizations, the significance of motivation is determined by the extent it influences professional satisfaction, task performance, and holistic wellness (Deci, Olafsen & Ryan, 2017). That is to say, the extent to which students' psychological needs are met by the perceived classroom climate is expected to be associated with their motivation to learn.

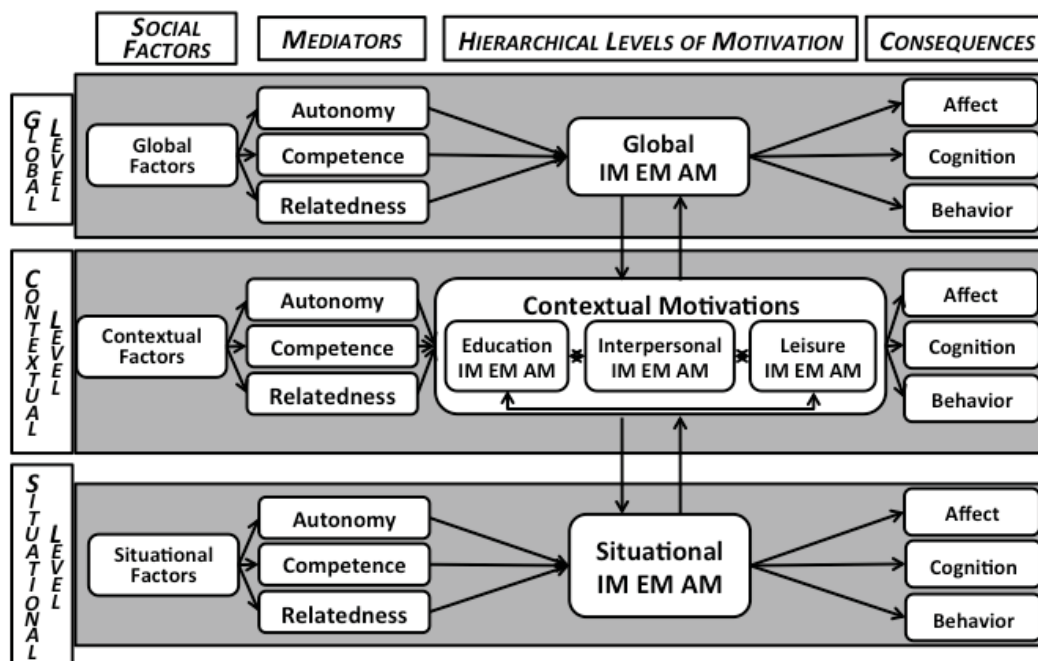


Figure 1: The Hierarchical Model for Motivation (source: Vallerand, 1997)

In order to differentiate short-term motivation from long-term motivation, SDT maps the Hierarchical Model for Motivation to categorize motivation into three levels: global, contextual, and situational (Guay, Mageau & Vallerand, 2003; Vallerand, 1997; Vallerand, 2000) as shown in Figure 1. The global level is highly abstract since the motivational orientations of an individual are due to personal identity. The contextual level is less abstract as it describes the perceived relationship of an individual to other concrete materials or organizations like schools. The situational level, which is the focus of this study, is more specific compared to global and contextual levels because it depicts an individual's motivational response to a specific activity. In the educational setting, students' general feelings towards school and learning affect their approaches to the learning environment and tasks. Conversely, classroom learning activities can affect the students' approaches to learning in general (Stolk, Jacobs, Girard & Pudvan, 2018).

Academic Motivation

Conceptualized in the context of SDT, academic motivation is the driving force that empowers students to learn or participate in the learning process (Ryan & Deci, 2002). Academic motivation is usually divided into intrinsic motivation and extrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation has been conceptualized as the internal driving force of an individual to participate in a particular activity for his curiosity, interest, or fulfilment (Deci, Cascio & Krusell, 1975). It is linked with other components like exploration, learning goals, and intrinsic intellectuality (Vallerand, 1992). In contrast, extrinsic motivation is an inducement for a person to participate in a particular activity so as to gain rewards or to avoid punishment (Dev, 1997).

Academic motivation is recognized as one of the most effective driving forces of student learning (Tucker, Zayco & Herman, 2002) as well as the only factor that guarantees students' academic achievement (Griffin, MacKewn, Moser & VanVuren, 2012). Among the numerous factors contributing to students' performance and academic achievement, academic motivation is considered as one of the most significant elements (Tucker, Zayco & Herman, 2002). Subsequently, it helps to enhance students' engagement (Pavlou, 2006), learning autonomy, and academic performance (Rana, Mahmood & Reid, 2015) in teaching and learning processes. More importantly, intrinsic academic motivation also has a positive significance on the reduction of stress and depression of undergraduate students, which could bring about a positive classroom atmosphere free from interpersonal conflicts (Huang, Lv & Wu, 2016).

Classroom Climate

Classroom climate is conceptualized as the intellectual, physical, emotional, and social environment in which students learn (Ambrose, Bridges, DiPietro, Lovett & Norman, 2010). It includes the physical environment of the classroom, the interaction between teacher and students, and teacher's behavioral and academic expectations of the students (O'Brennan, Bradshaw & Furlong, 2014). Wang et al. (2020) characterize a positive classroom setting as a safe, harmonious, and open environment, which could be influenced by the dynamics of the participants and the prevalent learning culture.

Empirical evidence suggests that a self-governed and healthy environment in the classroom positively contributed to students learning outcomes (Barksdale, 2017; Reyes, Brackett, Rivers, White & Salovey, 2012), and academic motivation (Anderson, Hamilton & Hattie, 2004). A classroom with a teacher's coaching and inspiration will lead to better coaching and encouragement among students, as well as motivation enhancement and prolonged student engagement (Seritanondh, 2013). Students in a teacher-supported and teacher-involved classroom indicate a higher level of motivation as students gain more enjoyment in the learning process and have more potential to achieve academic success; whereas, students in a classroom of teacher-control and peer-competition are more likely to face challenges like learning-weariness and anti-school feelings (Fry & Coe, 1980). According to previous studies, a classroom climate of involvement, autonomy, and meaningfulness advances students' motivational goal orientation (Ciani, Middleton, Summer & Sheldon, 2010; Lerdpornkulrat, Koul & Poondej, 2018). A classroom with good interpersonal relationship promotes student intrinsic motivation (Levy-Tossman, Kaplan & Assor, 2007; Nelson & DeBacker, 2008). Conversely, a negative classroom climate with poor peer relationships deters the growth of students' autonomous motivation in mathematics (Reindl, Berner, Scheunpflug, Zeinz & Dresel, 2015).

Additionally, in an agreeable and pleasant classroom climate, students feel safer, have more confidence in learning, and are not afraid of making mistakes (Morin, Marsh, Nagengast & Scalas, 2014). A classroom climate of order significantly leads to the increase of reading motivation of efficacy, compliance, challenge, and aesthetics, and the whole process contributes to greater student academic

achievement (Mucherah, Finch, Smith & Ambrose-Stahl, 2014). Specifically, a teacher-centered classroom climate facilitates undergraduates' self-efficacy in mathematics learning (Peters, 2013).

Academic Self-efficacy

Academic self-efficacy is conceptualized as one's confidence in his or her ability to complete learning tasks or achieve educational goals (Bandura, 2007). It is found to be multi-faceted and could impact how individuals feel, think, and carry out instructive assignments (Sharma & Nasa, 2014). Self-efficacy is developed on four bases of information, which are vicarious experiences, enactive mastery, physical and emotional states (Schunk & Pajares, 2002). As such, academic self-efficacy could be pertinent in student educational performances as it comes along with corresponding behaviors and motivations that empower or debilitate compelling execution.

Scholars have posited that positive teaching and learning outcomes rely on affective and psychological factors like self-efficacy (Bandura, 1977). Students, who believe that they have adequate capacity to complete tasks, tend to take specific actions to achieve their learning goals, which will bring about positive academic outcomes and success (Bandura, 1977). Additionally, Veresova (2016) argued that student academic self-efficacy was resolutely associated with their academic motivation and contributed to their learning performance as well as academic achievement. Other empirical researches also confirmed the positive effects of student self-efficacy on their academic motivation (Chi & Xin, 2006; Taheri-Kharamah, Sharififard, Asayesh, Sepahvandi & Hoseini, 2018). These findings are reinforced by recent experimental research demonstrating that the training of self-efficacy-building strategies significantly contributes to the improvement of students' academic self-efficacy and motivation. In addition, the results also confirm the causal-effect relationship between academic self-efficacy and student motivation (Cave, Evans, Dewey & Hartshorn, 2018).

3. Method

Research Design

A quantitative design and survey strategy were used to meet the research objectives. Data were drawn from 119 undergraduate students from a medical college located in Guangxi, China. Among the sample students, there were 25 males (21%) and 91 females (76.5%). The average age of the participants was 21 (SD = 1.4). The online questionnaire was distributed to undergraduate medical students via QQ-email in different sessions. In PLS-SEM, the needed sample size could be calculated by means of power analyses according to the part of the model obtaining the largest number of predictors (Hair, Hult, Ringle & Sarstedt, 2017). Hair, et al. (2017) further suggested researchers use Programs such as G*Power to do power analysis specific to model set-ups when utilizing PLS-SEM. G*power is a free online software used to do power analysis and sample size calculation. The analysis result of G*Power shows that the required sample size of this study is 92 (effect size=.15, alpha= .05, beta=.80, No. of predictor=5), indicating that 119 samples are adequate for data analysis and the sample size does not have an effect on the result.

Instruments

The current study used a questionnaire adopted from several scales. These scales consisted of a total of 43 items with a numerical rating scale ranging from 1 (not agree at all) to 9 (highest agreement). As a first step, the instrument was sent to three experts to validate the content. Then, a panel of bilingual experts was invited to validate the translation via a double back translation technique (Zikmund, Babin, Carr & Griffin, 2010).

Classroom Climate

Classroom climate was assessed with Classroom Climate Questionnaire (CCQ). The CCQ is a 26-item questionnaire developed by Hu (2010) to assess undergraduate students' perception of classroom climate in a college course. Classroom climate questionnaire includes five dimensions: a) cohesive, b) supportive, c) participative, d) planned, and e) fair. Cohesive dimension mainly reflects the extent to which students learn from each other, help each other, and support each other in the classroom. Supportive dimension focuses on the degree by which teachers are friendly, trustful, interested, and helpful to students in the classroom. Participative dimension reflects the degree of students' concentration, interest, participation, and enjoyment in classroom discussion and learning. Planned dimension refers to the extent by which students complete classroom activities, goals, and tasks. Fair dimension refers to the degree by which students are treated fairly by teachers. Reliabilities of the five dimensions are .904 (cohesive, n=6 item), .921 (supportive, n=6 item), .911 (participative, n=4 item), .876 (planned, n=5 item), and .929 (fair, n=5 item). The results of confirmative factor analysis reveal that the indicator loading of each item is higher than .70, and AVE value of each dimension is in the range of .67 -.80. In addition, the HTMT value of each dimension is smaller than .85.

Academic Self-efficacy

Academic self-efficacy was measured by a sub-scale titled Self-Efficacy for Learning and Performance of Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeachie (1991). The sub-scale was utilized to measure the level of students' perceived ability and confidence in a course. MSLQ was designed on the basis of a general cognitive perspectives on learning motivation and strategies and a theoretical framework proposed by McKeachie, Pintrich, Lin, and Smith (1986). This instrument has been widely used for many years and has been tested as reliable and valid in contemporary researches (Basila, 2016; Bibi, 2017; Rush, 2013; Taylor, 2012, Vaculíková, 2016). The reliability test indicates a high reliability of this scale. The reliability of the self-efficacy is .936 (n=8 item). The result of confirmative factor analysis reveals that the indicator loading of each item is higher than .70, AVE value is .71, HTMT value is smaller than .85.

Student Academic Motivation

Student academic motivation was measured by a sub-scale (i.e. goal orientation) of MSLQ. Goal orientation regards students' goals in a subject or course as a whole, i.e. academic motivation. Intrinsic goal orientation assessed students' self-perceived degrees to participate in learning tasks out of reasons like interest, curiosity, and challenge. Extrinsic goal orientation regards students' self-

perceived degrees to participate in learning tasks out of reasons, for example grades, rewards, competing with others, or evaluation by others. Therefore, this study adopts intrinsic goal orientation to evaluate intrinsic motivation and extrinsic goal orientation to assess extrinsic motivation. Reliabilities of the two dimensions are .842 (intrinsic, n=4 item), and .866 (extrinsic, n=4 item). The result of confirmative factor analysis shows that the indicator loading of each item was higher than .70, and AVE value of each dimension is .68 and .72 respectively. Additionally, the HTMT value of each dimension is smaller than .85.

4. Results

Table 1 summarizes the descriptive statistics of classroom climate (CC), self-efficacy (SE), academic motivation (AM), and the sub-constructs of classroom climate and academic motivation. The means of all constructs were higher than 6.34, indicating that students showed a generally high level of perceived academic self-efficacy, academic motivation, and classroom climate.

Table 1: Mean, SD, Skewness and Kurtosis of Constructs

Construct	Mean	SD	Skewness	Kurtosis
Cohesive	7.49	.96	-.54	-.08
Supportive	6.42	1.29	-.54	.47
Participative	6.64	1.29	-.61	.74
Planned	7.31	.96	-.37	-.18
Fair	7.23	1.18	-.62	.13
Intrinsic	7.34	.99	-.64	.18
Extrinsic	7.52	1.08	-.66	.18
SE	7.04	1.09	-.39	-.21
AM	7.43	.94	-.67	.17
CC	7.02	.96	-.34	-.48

With regard to the first research question, Pearson correlation was employed to analyze the relationship between perceived classroom climate, academic self-efficacy, and academic motivation using SPSS 24. Inter-correlations among the ten constructs are shown in Table 2. The result revealed strong correlation between classroom climate and academic self-efficacy ($r=.75$, $p < .001$), classroom climate and academic motivation ($r = .66$, $p < .001$), and students' self-efficacy and their academic motivation ($r=.75$, $p < .001$). Unexpectedly, all the constructs were also strongly associated.

Table 2: Inter-correlations among Constructs

Construct	1	2	3	4	5	6	7	8	9
1. CC	1								
2. AM	.66***	1							
3. SE	.75***	.75***	1						
4. Cohesive	.79***	.63***	.60***	1					
5. Supportive	.86***	.41***	.53***	.57***	1				
6. Participative	.89***	.48***	.61***	.62***	.81***	1			
7. Planned	.83***	.72***	.75***	.65***	.57***	.63***	1		
8. Fair	.83***	.60***	.69***	.59***	.61***	.60***	.73***	1	

9. Intrinsic	.64***	.90***	.74***	.61***	.40***	.47***	.70***	.59***	1
10. Extrinsic	.55***	.92***	.62***	.53***	.35***	.39***	.62***	.49***	.65***

Note. *** Correlation is significant at the .001 level (2-tailed)

In order to examine which dimension of perceived classroom climate significantly predicts student academic motivation and academic self-efficacy, stepwise multiple regression technique was employed to explore the causal effect among the constructs. Table 3 illustrates the output of multiple regression analysis of the dimension of classroom climate on academic motivation and self-efficacy.

Table 3: Multiple Regression of Classroom Climate on Academic Motivation and Self-efficacy

Dimension of Classroom Climate	b	β	t	Sig.	R²	%
Planned-> AM	.532	.546	6.526	.000	.518	51.8
Cohesive-> AM	.265	.271	3.244	.002	.557	3.9
Planned-> SE	.602	.531	6.044	.000	.567	56.7
Fair-> SE	.281	.304	3.462	.001	.603	3.8

The above result specified that among the five dimensions of classroom climate, two dimensions significantly correlate and contribute (55.7%) to student academic motivation. The dominant planned dimension ($\beta=.546$, $p=.000$) was found to contribute 51.8% of the variance to student academic motivation, and the cohesive dimension ($\beta=.271$, $p=.002$) contribute 3.9% of the variance to academic motivation. Accordingly, when the planned dimension and cohesive dimension of the classroom climate increase by one unit of standard deviation, student academic motivation will increase by .546 and .271 unit of standard deviation, respectively. Hence, the planned dimension and cohesive dimension have a strong and modest effect on student academic motivation (Muijs, 2011), respectively.

In regard to the significant predictors of classroom climate to student academic self-efficacy, the dimension of planned ($\beta=.531$, $p=.000$) and fair ($\beta=.304$, $p=.001$) were concluded in the prediction model. The planned dimension was found to contribute 56.7% of the variance to academic self-efficacy ($R^2=.567$), and the combination of planned and fair dimensions accounted for 60.3% of the student self-efficacy ($R^2=.603$). Based on the interpretation showed in Table 4, the two models demonstrated a large effect size on academic self-efficacy as a whole. Additionally, the dimension of planned and fair had a strong and modest effect on self-efficacy, respectively.

Subsequently, software SmartPLS 3 was applied to examine the indirect influence that academic self-efficacy exerted on the relationship between classroom climate and student academic motivation. Table 4 covers the relationship between variables in the model, and Figure 2 presents a structural illustration of the relationships. In Figure 2, the inner model depicts the path coefficients (β) and T-values, and the outer model shows the T-values.

Table 4: Summary of the Direct and Indirect Effect in the Model

Path	β	t	Sig.
CC -> AM	.242	2.454	.014
CC -> SE	.762	16.409	.000
SE -> AM	.576	6.356	.000
CC -> SE -> AM		5.688	.000

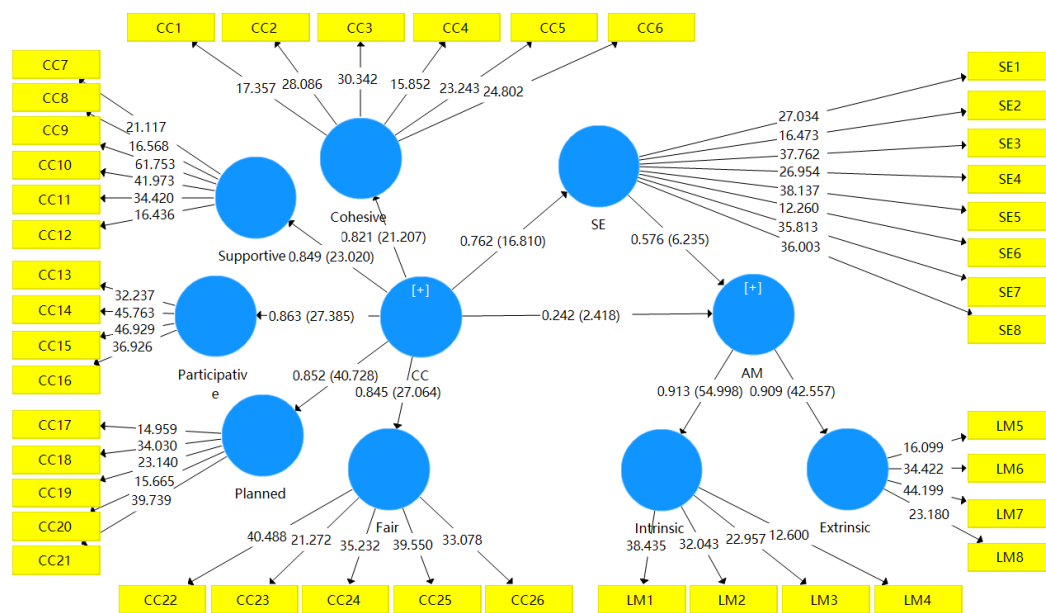


Figure 2: The Structural Model Assessment

According to the output shown in Figure 2 and table 4, the direct effect of classroom climate on student academic motivation is estimated at $\beta = .242$, and the indirect effect which is the multiplication of both indirect paths ($.762 \times .576$) equals to .439, leaving the standardized total effect (indirect + direct) at .681 (Hair et al, 2010). The direct path of classroom climate and academic motivation is supported; meanwhile, the two indirect paths (classroom climate -- academic self-efficacy -- academic motivation) are also confirmed (see Table 4). The result reveals that academic self-efficacy partially mediates the relationship between classroom climate and student academic motivation since both direct and indirect effects are established.

5. Discussion

Results obtained from data analysis have a number of implications; however, they should be interpreted with SDT and previous related findings.

First, the classroom climate significantly and positively affects student academic motivation. The findings of this study affirm the research results of Huang and Bai (2017) and Lerdpornkulrat (2018), which indicated that a healthy and positive classroom climate was pivotal for the improvement of student academic motivation. Specifically, a cohesive classroom climate, in which students learn and support each other, significantly improves academic motivation. This is

echoed by the findings of Anderson et al. (2004) noting that when secondary students felt a higher level of friendship in a classroom, they were more motivated to learn. More importantly, a planned classroom, in which students complete classroom tasks in high quality, greatly contributes to the improvement of student academic motivation ($R^2=51.8\%$).

Nevertheless, this study also found that a supportive classroom climate was closely correlated with ($p<.001$) but insignificantly influences student academic motivation. This is aligned with the previous findings (Fry & Coe, 1980) that teacher support was indispensable for the enhancement of student academic motivation; however, this is inconsistent with the findings of Huang and Bai (2017) stating that teacher support significantly and positively influenced student academic motivation. A probable reason for this inconsistency could have been the participant characteristics. As adult learners, undergraduates are less affected by teachers compared with primary and secondary students. According to the latest research, medical students indicated a higher level of autonomy in learning (Su, Ye, Li, Wei, Du & Lu, 2014). They have heavy learning tasks and devote a long time in learning so as to meet their higher academic requirements, making them live in a comparatively strong and competitive learning atmosphere. This atmosphere consequences further facilitates the development of their autonomy learning.

Second, the influence of classroom climate on student academic motivation is mediated by academic self-efficacy. The result is consistent with SDT and the findings reported in the research conducted in mainland China context (Huang & Bai, 2017). Students, who believe that their psychological needs are met in the social environment or who study in a positive and healthy classroom climate, indicate a higher level of confidence in their ability and academic motivation.

Third, a planned and fair classroom contributed to the improvement of self-efficacy. This is echoed by the research findings of Mucherah et al. (2014), which shows that a well-planned classroom climate helps to increase students' reading motivation. When the students complete classroom learning tasks and are treated equally, it helps them to build their self-confidence to achieve their learning goals and then improves their motivation to pursue personal development.

Fourth, the descriptive result recommends that the respondents of this study are highly motivated to learn. This is contradictory to the findings of Gao & Gao (2015), Liu (2013), and Qiu (2013) which indicate the insufficiency of academic motivation among college students. A conceivable explanation for this might be the better academic background of medical students compared with other disciplined students. In China, high school students need to get a higher score in the national college entrance examination so as to get the chance to be medical students.

Finally, the planned dimension of classroom climate has a very robust impact on student motivation ($\beta=.546$) and self-efficacy ($\beta=.531$), indicating that among the three psychological needs, competence is the most important for undergraduate

medical students in China. Overall, this finding is supported by the assumptions of SDT.

6. Conclusion

After analyzing the data collected from 119 medical students from a higher education institute, the results concluded the significant influence that classroom climate exerted on student academic motivation and the mediating effect of academic self-efficacy in the relationship. This study also indicated that among the five dimensions of classroom climate, a planned and fair classroom climate significantly improved student self-efficacy and a cohesive and planned classroom climate helps to motivate students to learn. This stresses the essence of a healthy and well-organized classroom climate in student learning. For policymakers and stakeholders, more related educational policies regarding classroom climate should be made, and they can also set classroom climate evaluation as a criterion to assess education practitioners. Standards regarding the management of positive classroom climates are heavily valued in America (Schonert-Reichl et al, 2017); whereas, related standards and policies in China cannot be found in the present literature. For school administrators, they need to safeguard teachers' actions within the classroom, which are consistent with research-based factors advised by this study and previous literature to promote student academic motivation and performance. Also, school administrators can launch programs that can effectively facilitate the classroom climate to improve student academic motivation. For lecturers, they can obtain the message that the promotion of a positive classroom climate is highly crucial and beneficial for students' academic performance. They can also build a classroom environment with a harmonious student relationship, treat the students in an equivalent way, and offer them more prospects to complete learning tasks. Despite the highlighted significant contributions of this study, further research could give a generalizable perspective by covering a larger sample size and population from different colleges and universities. In addition, exploratory studies could further explain the ways classroom environment are designed to further motivate students and improve their self-efficacy. Nevertheless, the findings of this study accentuate the notion that more meaning should be embedded in the design of learning tasks to meet students' needs of competence and to build their confidence and motivation.

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Appendix 1

Questionnaire for students

Dear students,

This survey is conducted to better understand the relationship between classroom climate, student academic self-efficacy and learning motivation so as to provide reference for the improvement of teaching and learning quality.

The questionnaire only needs to be answered according to your actual situation, there is no right or wrong answer. This survey does not require you to provide your names, and your answers are kept confidential. We sincerely hope to get your cooperation and support. Thank you.

Part I: Demographic Information

Please tick or fill in your relevant information in the description below

Gender : A. male B. female

School Year: A. 1 B. 2 C. 3 D. 4

Age: _____

Part II:

Please circle one of the options that you think is most suitable in the following items in accordance with your actual situation. For example:

not agree at all

1	2	3	4	5	6	7	8	9
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 highest agreement

classroom climate

Item		1=not agree at all 9=highest agreement								
1	I am very friendly to my classmates.	1	2	3	4	5	6	7	8	9
2	Many of the students in this course are my friend	1	2	3	4	5	6	7	8	9
3	I am very happy to work with my classmates on this course.	1	2	3	4	5	6	7	8	9
4	I will help my classmates in this course if they have trouble.	1	2	3	4	5	6	7	8	9
5	The classmates in this course like me.	1	2	3	4	5	6	7	8	9
6	In this course, I got help from other students.	1	2	3	4	5	6	7	8	9
7	The lecturer is concerned about me.	1	2	3	4	5	6	7	8	9
8	The lecturer took the trouble to help me.	1	2	3	4	5	6	7	8	9
9	The lecturer cares about my feeling.	1	2	3	4	5	6	7	8	9
10	The lecturer is happy to talk to me.	1	2	3	4	5	6	7	8	9
11	The lecturer is interested in the learning problems I have encountered.	1	2	3	4	5	6	7	8	9
12	The lecturer walked around the classroom and talked to us.	1	2	3	4	5	6	7	8	9

13	I put forward my own point of view in the discussion.	1	2	3	4	5	6	7	8	9
14	My insights and opinions are used in class discussion.	1	2	3	4	5	6	7	8	9
15	Classmates and I discuss ways to solve problems.	1	2	3	4	5	6	7	8	9
16	Everyone asked me to explain the solution to the problem.	1	2	3	4	5	6	7	8	9
17	I follow the lesson plan to learn	1	2	3	4	5	6	7	8	9
18	I understand the learning objectives of this course.	1	2	3	4	5	6	7	8	9
19	I understand the goal I have to work on in this course.	1	2	3	4	5	6	7	8	9
20	I always concentrate on my class.	1	2	3	4	5	6	7	8	9
21	I try my best to understand the teaching content.	1	2	3	4	5	6	7	8	9
22	The lecturer gave me as much attention as other students.	1	2	3	4	5	6	7	8	9
23	The lecturer gave me as much help as other students.	1	2	3	4	5	6	7	8	9
24	I have the opportunity to speak in class as much as other students.	1	2	3	4	5	6	7	8	9
25	The lecture treats me as good as other students.	1	2	3	4	5	6	7	8	9
26	I got the opportunity to participate in the discussion in class, as much as other students.	1	2	3	4	5	6	7	8	9

Self-efficacy

Item		1=not agree at all 9=highest agreement								
1	I believe I will receive an excellent grade in this class.	1	2	3	4	5	6	7	8	9
2	I'm certain I can understand the most difficult material presented in the readings for this course	1	2	3	4	5	6	7	8	9
3	I'm confident I can learn the basic concepts taught in this course.	1	2	3	4	5	6	7	8	9
4	I'm confident I can understand the most complex material presented by the instructor in this course.	1	2	3	4	5	6	7	8	9
5	I'm confident I can do an excellent job on the assignments and tests in this course.	1	2	3	4	5	6	7	8	9

6	I expect to do well in this class	1	2	3	4	5	6	7	8	9
7	I'm certain I can master the skills being taught in this class.	1	2	3	4	5	6	7	8	9
8	Considering the difficulty of this course, the teacher, and my skills, I think I will do well in	1	2	3	4	5	6	7	8	9

Academic motivation

Item		1=not agree at all 9=highest agreement								
1	In a class like this, I prefer course material that really challenges me so I can learn new things.	1	2	3	4	5	6	7	8	9
2	In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	1	2	3	4	5	6	7	8	9
3	The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible	1	2	3	4	5	6	7	8	9
4	When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade	1	2	3	4	5	6	7	8	9
5	Getting a good grade in this class is the most satisfying thing for me right now.	1	2	3	4	5	6	7	8	9
6	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	1	2	3	4	5	6	7	8	9
7	If I can, I want to get better grades in this class than most of the other students	1	2	3	4	5	6	7	8	9
8	I want to do well in this class because it is important to show my ability to my family, friends, employer, or others	1	2	3	4	5	6	7	8	9