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The Role of Team Activities and External Support Environment in Leadership Development: An Emotional Intelligence Perspective

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Abstract

Understanding the factors that shape leadership development is crucial for preparing individuals to effectively lead in diverse and dynamic environments, making this study particularly significant as it explores the roles of team activities, family support, and campus environments in fostering leadership, with emotional intelligence as a key mediating factor. This study investigates the key factors influencing university student leadership development, focusing on the role of team activities, family environment, and campus environment, with emotional intelligence acting as a mediating variable. A stratified random sampling method was used to gather data universities in Guangdong Province, China. Structural equation modeling (SEM) was applied to assess the relationships between these variables. The results revealed that team activities, family environment, and campus environment significantly impact leadership development, both directly and indirectly through emotional intelligence. These findings offer valuable insights into improving leadership training programs in higher education, emphasizing the importance of enhancing emotional intelligence and providing supportive environments.

Keywords: Emotional Intelligence, Team Activities, Family Environment, Campus Environment, Structural Equation Modeling, Leadership Development.

Introduction

With the continuous development of the economy, society's expectations of university students are also increasing. Academic performance (Rashid & Asghar, 2016), personal growth (Acharya et al., 2018), and future career development (Kwiek & Antonowicz, 2015) place ever-growing demands on today's university students. As a result, students are compelled to face social challenges such as financial pressures (Akkermans & Kubasch, 2017), career planning decisions (Gati & Kulcsár, 2021), interpersonal relationship issues (Wu et al., 2015), adaptability concerns, and self-management (Mørch et al., 2018). When these demands are difficult to meet, some students may even experience mental health problems (Pedrelli et al., 2015), such as anxiety, depression, and failure in stress management (Beiter et al., 2015). These issues deeply trouble the student community, affecting both their short- and long-term life plans, and are often difficult to detect and eliminate (Azizli et al., 2015).

There are several issues university students face in their leadership development (Daniëls et al., 2019). First, a lack of self-confidence (Öqvist & Malmström, 2018), which often hinders their ability to take initiative, make decisions, and effectively lead teams. Many students doubt their leadership abilities and may be reluctant to take on leadership roles or responsibilities. Second,

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poor communication skills (Virtanen & Tynjälä, 2019), which can limit their effectiveness in coordinating teams, articulating ideas, and building strong interpersonal relationships essential for successful leadership. Students often struggle with effective communication and teamwork, which can hinder their leadership capabilities and negatively impact the overall performance of their team. Finally, time management issues (Markle, 2015), as students need to balance academics, extracurricular activities, and personal life, which can lead to poor time management and, consequently, hinder their ability to effectively take on leadership roles and responsibilities.

Moreover, students who lack leadership skills often have weak self-management, poor teamwork abilities, and limited communication and decision-making skills. They may also lack a sense of social responsibility (Alhouti et al., 2016). In the job market, this deficiency in leadership can reduce their competitiveness, as leadership is a crucial soft skill. Students with underdeveloped leadership abilities may face more challenges in finding employment or advancing in their careers (Santos, 2016).

To address the aforementioned issues, China has implemented a series of measures to help university students enhance their leadership skills (Song, 2018). From a policy perspective, the Chinese government has introduced various education reform policies in recent years (Lu et al., 2019), emphasizing quality education and holistic development. These policies focus on cultivating students' overall abilities, including leadership. For instance, the "General Plan for Deepening the Reform of Education Evaluation in the New Era" issued by the Ministry of Education highlights the assessment of students' comprehensive abilities (You, 2019), such as leadership and teamwork. Additionally, the government's support for innovation and entrepreneurship policies encourages universities to establish courses and practical bases in these areas, promoting leadership development through entrepreneurial practice (He et al., 2019).

As the demand for leadership and innovation skills grows in society, businesses and social organizations are also actively involved in cultivating leadership among university students. For example, many companies and NGOs collaborate with universities to offer internship opportunities, training courses, and volunteer programs (den Hond et al., 2015). In addition to traditional management courses, some universities offer elective courses on leadership, teamwork, and public speaking, providing students with systematic knowledge and skills related to leadership (Carter et al., 2016). Schools also organize activities such as Model United Nations (Beynaghi et al., 2016) and student organizations (Henderson et al., 2017), giving students the opportunity to develop leadership skills through practical experiences.

Existing research on university student leadership primarily focuses on the following areas: First, work experience helps enhance university students' leadership skills (Salisbury et al., 2012). The findings suggest that, after considering pre-college characteristics and university participation, work experience has a significant positive impact on leadership development. Off-campus employment is shown to have a particularly strong effect, although extensive off-campus work may reduce the positive impact of peer interactions and extracurricular activities on leadership development. University students lacking leadership skills find it more difficult to secure job opportunities in the labor market. The primary aim of this type of research is to assess the employability of university students in higher education institutions, which is used to evaluate their job readiness and provide recommendations to government agencies and other stakeholders (Azmi et al., 2018). Thirdly, the relationship between students' academic performance and their leadership roles, and how one may influence the other in terms of skill development, time

management, and career opportunities (Dunbar et al., 2018). This paper focuses on examining how leadership skills and positions can improve students' academic outcomes. These types of studies are diverse and analyze student leadership from various perspectives. However, they often focus on how to improve leadership or how leadership can benefit students, while lacking exploration into the elements and components that shape the leadership model for university students. Understanding this model is fundamental to helping students enhance their leadership skills and should become a key focus in academic research.

Based on the above research gap, this paper proposes the following three research objectives: (1) This paper aims to investigate the key elements of the university student leadership model and their mechanisms of influence, exploring how these elements interact and impact students' leadership performance. (2) This paper aims to explore the various components that constitute the university student leadership model, such as team activities, family environment, campus environment, and emotional intelligence, and examine how these components influence leadership skills through specific mechanisms. (3) This paper aims to assess the effectiveness of the university student leadership model and its strategies for improvement, identifying the most critical elements and components for leadership development and proposing concrete recommendations and strategies for enhancement.

Literature Review and Hypothesis Development

Team Activities, Emotional Intelligence and Leadership Development

The relationship between university students' participation in team activities and emotional intelligence development has garnered significant attention in the literature (Lopes, 2016). Emotional intelligence is typically defined as the ability to recognize, understand, manage, and effectively use one's own emotions and the emotions of others, and is considered a key skill for leadership and personal development (Goleman, 1995; Salovey & Mayer, 1990). Additionally, social cognitive theory (Luszczynska & Schwarzer, 2015) posits that there is a continuous interaction between an individual's behavior, cognition, and environment. Extensive literature suggests that participation in team activities positively influences university students' emotional intelligence development (Maguire et al., 2017). These activities provide an experiential learning environment that allows students to develop and apply emotional intelligence skills, which are essential for their personal and leadership growth. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 1: Participation in Team Activities Has A Positive Impact on University Students' Emotional Intelligence.

Team activities offer university students hands-on leadership experience, allowing them to practice and refine their leadership capabilities. (Askren & James, 2021) These activities often require students to collaborate, communicate effectively, make decisions, and motivate team members—key leadership skills. Scholars such as Komives (2015) have highlighted the role of leadership development in higher education, stressing the importance of extracurricular activities and engagement outside the classroom. The literature strongly supports the idea that participation in team activities positively impacts university students' leadership development (Boyatzis, 2018). Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 2: Participation in team activities has a positive impact on university.

Family environment, emotional intelligence and leadership development

Emotional intelligence encompasses the ability to recognize, understand, manage, and effectively utilize emotions (Masika & Jones, 2016), and the development of these abilities often begins with early interactions and emotional experiences within the family. Early emotional experiences are crucial in laying the foundation for an individual's emotional intelligence (Petrides et al., 2016). In a positive family environment, emotional support, open communication, and mutual understanding among family members provide a safe foundation for individuals to explore and regulate their emotions (Feeney & Collins, 2015). Such an environment is typically characterized by emotional warmth and empathy, encouraging adolescents to express their emotions freely and learn how to identify and manage their feelings through family interactions. Given the profound influence of the family environment on emotional intelligence development, we can infer that a positive family environment has a positive impact on university students' emotional intelligence (Kant, 2019). Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 3: A positive family environment has a positive impact on university students' emotional intelligence.

Previous research suggests that leadership skills and qualities often stem from early experiences and family upbringing, with a positive family environment playing a crucial role in shaping leadership traits through values, role modeling, and support (Redmond & Dolan, 2016). The transmission of family values, demonstration of behaviors, and emotional support can provide a strong foundation for the development of leadership (Rudolph et al., 2018). Based on this reasoning, we can reasonably infer that a positive family environment has a positive impact on the leadership development of university students. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 4: A positive family environment has a positive impact on the leadership development of university students.

Campus Environment, emotional intelligence and leadership development

Educational psychology (Gkintoni et al., 2023) and emotional intelligence (EI) development theories suggest that the campus environment is not only a place for acquiring academic knowledge but also a crucial setting for cultivating emotional intelligence (Göncz, 2017). The campus provides multifaceted support for the development of emotional intelligence (Thomas et al., 2017). Based on the above theories and research, we can reasonably infer that a positive campus environment contributes to the development of emotional intelligence in university students. By offering a wealth of course resources, teacher support (Brackett et al., 2012), and social platforms (Early, 2020), the campus provides comprehensive opportunities for students to develop emotional intelligence skills. These environmental factors work together to help students better understand and manage their emotions, navigate social relationships, and effectively cope with the pressures and challenges of both academic and personal life. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 5: A positive campus environment has a positive impact on the emotional intelligence development of university students.

University students' leadership skills are derived not only from theoretical knowledge gained in courses but also from the practical and applied opportunities provided by the campus environment (Leih & Teece, 2016). A positive campus environment offers comprehensive support for leadership development through curriculum design, teacher guidance, and social

platforms. Research by Komives et al. (2011) emphasizes the positive impact of leadership education courses on students' leadership development, highlighting that these courses not only impart knowledge but also cultivate students' leadership mindset and application abilities. Therefore, it is evident that a positive campus environment will have a positive impact on the leadership development of university students (Eich, 2008). Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 6: A positive campus environment has a positive impact on the leadership development of university students.

Emotional Intelligence and Leadership Development

EI has been a focal point in leadership development research, widely regarded as a key factor in shaping effective leadership abilities. It is suggested that EI plays a positive role in enhancing university students' leadership skills. First defined by Mayer et al. (1999) and later popularized by Cherniss et al. (1998), EI refers to the ability to recognize, understand, manage, and effectively use one's own and others' emotions. Studies by Boyatzis (2018) and Goleman (2002) emphasize that EI competencies such as self-awareness and empathy are crucial for effective leadership. Studies by Côté and Miners (2006) and Boyatzis et al. (2000) further demonstrate that EI plays a decisive role in leadership success. Therefore, this proposition is not only significant in leadership research but is also well-supported by theoretical and empirical evidence, suggesting that EI positively influences the leadership development of university students. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 7: Emotional intelligence (EI) has a positive impact on the leadership development of university students.

Emotional Intelligence as Mediating Variable

In recent years, the mediating role of EI between university students' participation in team activities and leadership development has garnered significant attention. EI, which includes the ability to recognize, understand, manage, and effectively use emotions, is closely linked to leadership skills and behaviors. Numerous studies have highlighted the positive relationship between EI and effective leadership. As (Goleman, 1995) pointed out, EI helps enhance a leader's ability to motivate and influence others, manage conflicts, and promote teamwork. Therefore, it is plausible to consider EI as a mediating variable between team activity participation and leadership development. (Bar-On, 1997) found that individuals with higher emotional intelligence are more likely to exhibit leadership qualities such as empathy, self-awareness, and adaptability. Participating in team activities provides students with opportunities to practice and improve EI skills, as they must navigate team dynamics, resolve interpersonal conflicts, and motivate team members. Thus, it is proposed that EI mediates the relationship between a positive team activity environment and university students' leadership development. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 8: Emotional intelligence mediates the relationship between participation in a positive team activity environment and leadership development in university students.

The interaction between a positive family environment, emotional intelligence, and leadership development in university students is another significant theme in the literature. A family environment that provides emotional support, communication, and encouragement fosters the development of an individual's emotional intelligence. Studies by Mayer et al. (2011) emphasize

the key role EI plays in interpersonal relationships and leadership. A positive family environment that encourages emotional expression, empathy, and self-awareness promotes the enhancement of students' EI. Furthermore, EI plays a crucial role in leadership development. Leaders with high emotional intelligence often excel in communication, conflict resolution, and teamwork. Therefore, it can be hypothesized that EI mediates the relationship between a positive family environment and leadership development in university students. Mayer et al. (2008) further support this view, showing that individuals from supportive family backgrounds tend to exhibit higher levels of EI, which in turn influences their leadership skills and behaviors.

Both hypotheses focus on the mediating role of EI, offering insights into how positive environments—whether in team activities or family settings—contribute to leadership development through the enhancement of emotional intelligence. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 9: Emotional intelligence mediates the relationship between a positive family environment and leadership development in university students.

The mediating role of EI between a positive campus environment and leadership development in university students has become an emerging research focus. A positive campus environment, particularly one that emphasizes leadership development, can foster the growth of students' emotional intelligence. EI is closely linked to effective leadership, as it enables leaders to navigate complex social situations, understand others' emotions, and make informed decisions. Leadership courses often incorporate EI development, encouraging students to cultivate self-awareness, empathy, and social skills. Research by (Elbertson et al., 2009) underscores the strong connection between EI, leadership development, and the campus environment. A positive campus environment that prioritizes EI development can significantly enhance university students' leadership skills. Thus, it is posited that EI acts as a mediator in the relationship between a positive campus environment and leadership development in university students, suggesting that a campus environment that emphasizes EI growth can foster more effective leadership development. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 10: Emotional intelligence mediates the relationship between a positive campus environment and leadership development in university students.

In conclusion, Hypotheses 8, 9, and 10 all propose that EI serves as a mediator between team activities, family environment, and campus environment, and the leadership development of university students. The literature supports this view, suggesting that environments focused on fostering EI—whether in teams, families, or on campus—have a positive impact on students' leadership abilities. By enhancing emotional intelligence, these environments contribute to the development of key leadership skills such as empathy, self-awareness, emotional regulation, and effective communication, which are essential for successful leadership.

Based on the above hypotheses and analysis, a theoretical model of all hypotheses is presented in Figure 1.

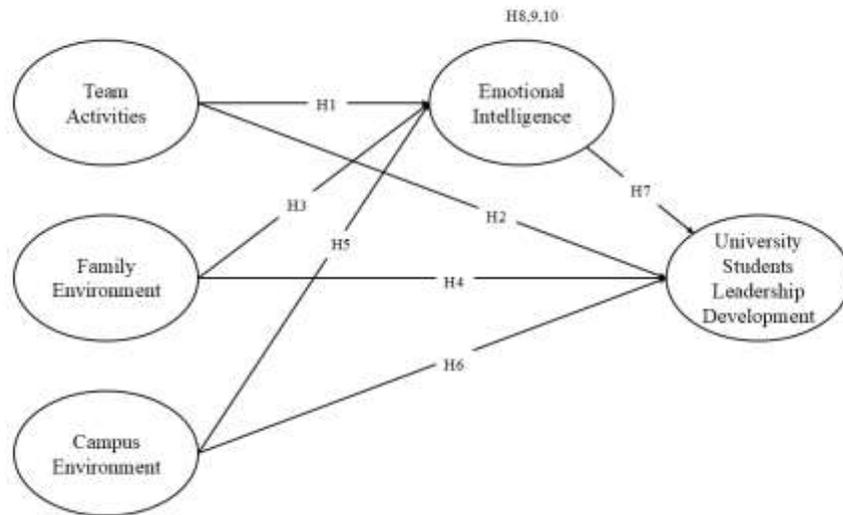


Figure 1 The Theoretical Model

Methodology

Participants and Procedure

This study used a stratified random sampling method to select participants, targeting university students from Guangdong Province, People's Republic of China. After obtaining approval from the Ethics Committee of the first author's institution, the researchers conducted a survey among undergraduate and vocational college students in Guangdong from September to October 2024. The choice of 67 universities and colleges in Guangdong Province as the sample source was mainly to ensure the sample's representativeness and the study's feasibility. Selecting urban household registration students as the research subjects helps to deeply analyze the leadership development process and influencing factors within a more favorable socio-economic background, thereby providing valuable insights for constructing a leadership model tailored to this group of students. All respondents were informed of the purpose of the survey and signed informed consent forms before completing the questionnaire. To ensure representativeness and fairness, the sample size was calculated as 1% of the total student population at each institution. The decision to use a 1% sampling rate was based on the need to balance sample representativeness with the feasibility of the study and data processing efficiency (Fowler, 2014). A total of 1,502 questionnaires were distributed, with 1,420 valid responses collected, resulting in a valid response rate of 94.5%, demonstrating excellent questionnaire accuracy (Comrey & Lee, 2013). Comrey and Lee (1992) argued that a sample size of over 1000 participants indicates excellent survey accuracy and recommended that researchers aim for samples of 500 or more observations whenever possible (MacCallum et al., 1999). Table 1 outlines the demographic characteristics of the 1,420 university students who participated in the survey. The findings are as follows: (1) The gender ratio was relatively balanced; (2) The fewest participants were from the Natural Sciences discipline, while students majoring in Engineering and Technology had the largest representation; (3) Over 80% of the participants were undergraduates, with the majority

being third-year students; (4) In terms of parental occupations, the largest proportion of fathers worked in Technology and Engineering professions, while the largest proportion of mothers worked in Business and Finance professions.

Profiles	Survey (%)
<i>Gender</i>	
Male	54.0
Female	46.0
<i>Major</i>	
Engineering and Technology	40.4
Humanities and Social Sciences	35.8
Natural Sciences	23.9
<i>Grade Level</i>	
Freshman <input type="checkbox"/> <input type="checkbox"/>	21.5
Sophomore	16.5
Junior	23.8
Senior	23.6
Graduate	10.6
Doctorate	3.9
<i>Father's Occupation</i>	
Public Servant	7.7
Business and Finance Professional	14.6
Education and Research Professional	20.6
Technology and Engineering Professional	25.8
Healthcare Professional	18.4
Cultural and Artistic Professional	6.1
Information	3.2
Technology Professional	3.6
Other	7.7
<i>Mother's Occupation</i>	
Public Servant	17.3
Business and Finance Professional	22.8
Education and Research Professional	18.8
Technology and Engineering Professional	6.1
Healthcare Professional	17.0
Cultural and Artistic Professional	4.4
Information	2.0
Technology Professional	11.6
Other	17.3

Table 1 Participant profile (N = 1420).

Instruments

This survey aims to investigate the various factors influencing the leadership development of university students. The research team followed the steps outlined by Nettet and Helgesen (2014) in designing and implementing the survey. The questionnaire is divided into three

sections. The first section asks respondents to report demographic information, which provides necessary background for further data analysis, including gender, academic major, year of study, father's occupation, mother's occupation, and family residence. The second section explores factors affecting leadership development, using a Likert scale and closed-ended questions to delve into different aspects of leadership development. This section consists of four categories:

- (1) **Team Activities:** Questions in this category were drafted based on the questionnaire made by Hancock et al. (2021), exploring how participation in campus activities, social events, and sports activities impacts leadership development.
- (2) **Family Environment:** The questions in this category refer to the study and cover aspects such as family intimacy, family communication, and family conflict (Council et al., 2011).
- (3) **Campus Environment:** This section uses the questionnaire template from Zen et al. (2014) and includes leadership courses, teachers' transformational leadership, and leadership platforms.
- (4) **Personal Psychological Factors:** This category focuses on students' emotional intelligence and is based on the questionnaire developed by Caruso et al. (2002), which was adapted for this study. The questionnaire design ensures that each question is clear, unbiased, and aligned with the research objectives. Participants are asked to rate their agreement with each statement on a scale of 1 to 5, where 5 represents "strongly agree," 4 represents "agree," 3 represents "neutral," 2 represents "disagree," and 1 represents "strongly disagree."

The researchers made modifications to some items on the scale based on the cultural context and circumstances of China. Therefore, to ensure the reliability of the revised scale, a pilot test was conducted. A total of 67 valid questionnaires were received from the pilot test, and the results showed that the Cronbach's alpha coefficients were all greater than 0.8, demonstrating that the researchers' modifications to the scale were appropriate.

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Data Analysis

In this study, structural equation modeling (SEM) and AMOS 26.0 software were employed to analyze the constructed model. SEM is commonly used to assess latent variables in measurement models and test assumptions among latent variables in structural models (Hair et al., 2012). The two-step modeling approach proposed by Anderson and Gerbing (1988) was adopted, involving the evaluation of both measurement and structural models using SEM. Firstly, in the reliability and validity section, the researchers examined the reliability and validity of the measurement tools. The minimum Cronbach's alpha coefficient for all variables was 0.775, indicating good reliability and validity of the instruments. Secondly, the researchers employed the maximum likelihood estimation method to validate the relationships among high-intensity physical activity, social anxiety, self-disclosure, and social avoidance. Thirdly, 2000 bootstrap samples were utilized to test the indirect effects between high-intensity physical activity and social avoidance. Lastly, the effectiveness of the model was assessed, and fit indices and path coefficients of the hypothesized model were measured.

Results Analysis

This study employs both questionnaires and interviews to address three interrelated objectives focused on university student leadership development. Objective 1 identifies key factors influencing leadership development, such as emotional intelligence, family support, and practical experience, which lay the groundwork for Objective 2. Objective 2 develops a leadership model tailored to Guangdong's unique characteristics, based on these insights. Objective 3 aims to create a leadership model that enhances students' skills, personal development, and global workforce readiness, integrating the findings from Objectives 1 and 2. The three objectives are closely linked to the model. The factors identified in Objective 1 form the foundation of the model in Objective 2, which adapts it to Guangdong's context. Objective 3 directly builds on the model by proposing a framework to enhance students' leadership abilities.

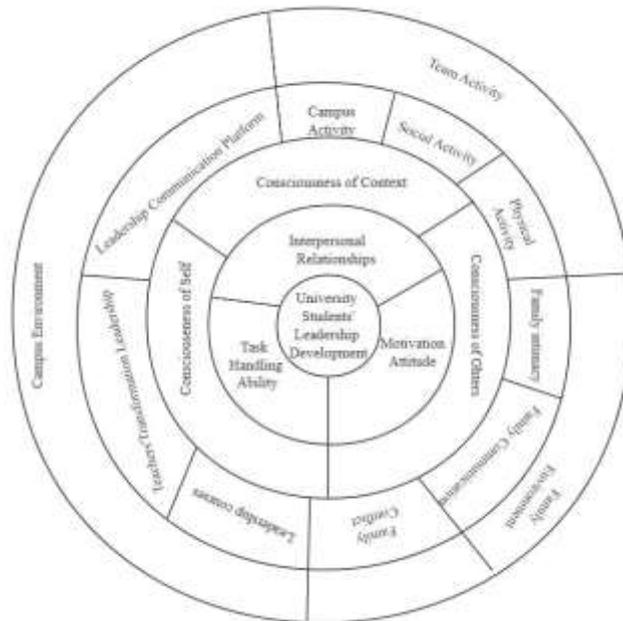


Figure 2 The Model of University Student Leadership Development in The People's Republic of China

Assessment of the Measurement Model Reliability and Validity

This study calculated Cronbach's alpha and composite reliability (CR) coefficients for latent variables to examine reliability and discriminant validity (Fornell & Larcker, 1981). As shown in Table 2, the Cronbach's alpha coefficients of the variables were in the range of 0.775–0.784, all CR values were higher than 0.9, and the average variance extracted (AVE) of all variables was in the range 0.769–0.874. Therefore, all variables had high reliability and convergent validity. Additionally, according to Clark and Watson (2016) and Lee et al. (2011), when the HTMT value is below the threshold of 0.85, it can be concluded that the discriminant validity of the variables is satisfactory. As shown in Table 3, all correlation coefficients are below 0.85, indicating that all variables exhibit good discriminant validity.

Items	Loading	C α	CR	AVE
Team Activities (TA)		0.776	0.841	0.639
CAI	0.797			
SAI	0.804			
PAI	0.797			
Family Environment (FE)		0.777	0.821	0.605
FI	0.766			
FC	0.794			
FCT	0.774			
Campus Environment (CE)		0.784	0.834	0.627
LC	0.806			
TTL	0.785			
TCP	0.784			
Emotional Intelligence (EI)		0.775	0.793	0.561
CC	0.737			
CS	0.757			
CO	0.753			
University Students Leadership Development (USLD)		0.780	0.769	0.527
IR	0.811			
MA	0.680			
THA	0.680			

Table 2 Reliability And Validity Test.

Note: C α = Cronbach's alpha; AVE = average variance extracted; CR = composite reliability. CAI=Campus Activity; SAI= Social Activity; PAI= Physical Activity ; FI=Family Intimacy; FCT= Family Communication; FCT= Family Conflict; LC=Leadership Courses; TTL=Teacher's Transformational Leadership; TCP= Leadership Communication Platform; CC=Consciousness of Context; CS=Consciousness of Self; CO=Consciousness of Others; IR=Interpersonal Relationships; MA=Motivation Attitude; THA=Task Handling Ability.

	CE	FE	TA	EI	USLD
CE					
FE	0.623				
TA	0.602	0.534			
EI	0.492	0.419	0.264		
USLD	0.79	0.648	0.595	0.593	

Table 3 Discriminant validity test.

Notes: TA=Team Activities; FE=Family Environment; CE=Campus Environment; EI=Emotional Intelligence; USLD= University Students Leadership Development.

Hypothesis Testing Results

First, the error and residual terms of the structural equation model did not show negative values, indicating that the model did not violate the estimation. Second, the goodness of fit between the

data and the structural equation model was high ($\chi^2/df=1.557$, GFI = 0.923, AGFI = 0.919, NFI = 0.929, CFI = 0.973, TLI = 0.972, RMSEA = 0.020), much better than the suggested value. Third, according to the results of the Pearson correlation in Table 3, there were significant correlations between the independent variable, mediators, and dependent variable, which supported the validation of the hypotheses. Fourth, the structural path model in Figure 2 shows that the relationship between team activities and emotional intelligence was statistically significant ($\beta = 0.292$, $p < 0.001$), supporting H1; that the relationship between team activities and university students leadership development was statistically significant ($\beta = 0.256$, $p < 0.001$), supporting H2; and that the relationship between family environment and emotional intelligence was statistically significant ($\beta=0.328$, $p < 0.001$), supporting H3; and that the relationship between family environment and university students leadership development was statistically significant ($\beta=0.157$, $p < 0.001$), supporting H4; and that the relationship between campus environment and emotional intelligence was statistically significant ($\beta=0.365$, $p < 0.001$), supporting H5; and that the relationship between campus environment and university students leadership development was statistically significant ($\beta=0.146$, $p < 0.001$), supporting H6.

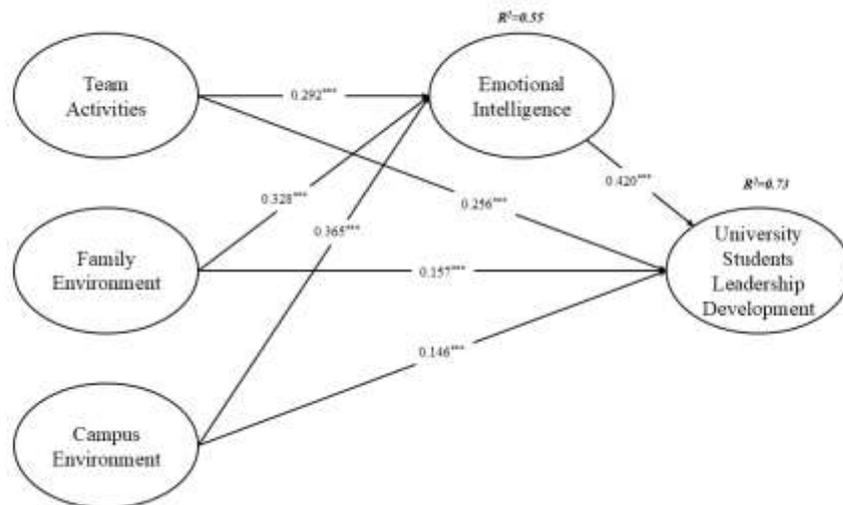


Figure 3 Structural path model. *** $p < 0.001$. Standardized coefficients are reported.

We hypothesized that team activities, family environment, and campus environment influence university student leadership development through a mediator: emotional intelligence. This study used the bootstrapping method to test the mediating effect (Bollen & Stine, 1990). The standardized results of the 95% confidence interval for the 2000-bootstrap sample are shown in Table 4: the absolute values of all Z-values are greater than 2.33, and there is no zero value within the 95% confidence interval. Additionally, team activities, family environment, and campus environment significantly influence university student leadership development through the mediator of emotional intelligence, with standardized indirect effects of 0.197, 0.235, and 0.24, respectively ($p < 0.001$), supporting hypotheses H8, H9, and H10. The results indicate that the more team activities a student engages in and the better the family and campus environments, the stronger their leadership development as a university student.

				Bootstrapping				
	Point Estimate	Product of Coefficients		Percentile 95% CI		Bias-Corrected 95% CI		Two-Tailed Significance
		S.E.	z	Lower	upper	lower	upper	P
Direct effects								
TA→EI	0.292	0.037	7.892	0.221	0.372	0.22	0.371	0.000(***)
FE→EI	0.328	0.042	7.810	0.243	0.409	0.246	0.412	0.000(***)
CE→EI	0.365	0.039	9.359	0.292	0.45	0.291	0.447	0.000(***)
TA→USLD	0.256	0.033	7.758	0.193	0.329	0.191	0.326	0.000(***)
FE→USLD	0.157	0.035	4.486	0.085	0.23	0.085	0.23	0.000(***)
CE→USLD	0.146	0.033	4.424	0.077	0.215	0.078	0.217	0.000(***)
EI→USLD	0.420	0.043	9.767	0.337	0.517	0.337	0.517	0.000(***)
Indirect effects								
TA→USLD	0.197	0.014	14.071	0.113	0.203	0.1188	0.167	0.000(***)
FE→USLD	0.235	0.015	15.667	0.097	0.186	0.097	0.187	0.000(***)
CE→USLD	0.240	0.015	16.000	0.086	0.165	0.113	0.204	0.000(***)
Total effects								
TA→USLD	0.197	0.014	14.071	0.113	0.203	0.1188	0.167	0.000(***)
FE→USLD	0.235	0.015	15.667	0.097	0.186	0.097	0.187	0.000(***)
CE→USLD	0.240	0.015	16.000	0.086	0.165	0.113	0.204	0.000(***)

Table 4 Standardized Direct, Indirect, And Total Effects.

Notes: Standardized estimations of 5000 bootstrap samples. ** $p < 0.01$, TA=Team Activities; FE=Family Environment; CE=Campus Environment; EI=Emotional Intelligence; USLD=University Students Leadership Development.

Conclusion

Theoretical Contribution

This study makes several important contributions to the theoretical analysis of university student leadership development. Unlike existing research, which primarily focuses on the relationship between leadership development and work (Salisbury et al., 2012), the role of leadership (Azmi

et al., 2018), and the link between academics and leadership (Dunbar et al., 2018), this research explores a leadership development model that has not been extensively examined. It offers a more targeted approach and enriches the theoretical framework surrounding student leadership (Reyes et al., 2019). The study argues that a thorough analysis of the factors driving leadership development is essential for identifying ways to enhance student leadership, thus improving the overall quality of contemporary university students (Dolev & Leshem, 2017).

The findings highlight the significant role of social environments and emotional intelligence in leadership development. Unlike previous studies, this research places greater emphasis on the development models and mechanisms, focusing on the factors that influence leadership. This approach provides more effective methods for improving university students' leadership skills. The study underscores the importance of team activities, family environment, and campus environment in enhancing emotional intelligence. By fostering the ability to recognize, understand, manage, and use emotions, as well as promoting empathy, these contexts can significantly improve students' leadership abilities.

Moreover, emotional intelligence impacts key leadership aspects such as self-awareness and self-regulation, enabling students to manage emotions effectively in stressful situations. This emotional control helps them make better decisions, resolve conflicts efficiently, and maintain composure in complex situations (Trigueros et al., 2020). Emotional intelligence also equips students to navigate social interactions, communicate persuasively, motivate others, and boost team morale, all of which contribute to their leadership development. In this leadership model, emotional intelligence serves as a critical mediating factor, while team activities, family, and campus environments directly enhance students' leadership abilities. Overall, this study demonstrates that leadership development in university students is shaped not only by theoretical knowledge but also by the practical experiences provided by their social environments (Knight & Novoselich, 2017).

Practical Implications

This study offers important practical insights for leadership development in higher education institutions. Firstly, the findings highlight the crucial role of emotional intelligence in university students' leadership development. Based on this, universities can design emotional intelligence training programs aimed at improving students' leadership skills through emotional management, self-awareness, and interpersonal relationship training. Additionally, the study emphasizes the significance of family and campus environments in shaping students' leadership abilities (Demetriou et al., 2017). Universities can strengthen collaboration with families by regularly organizing parent training sessions, helping parents understand the key role they play in leadership development, and providing better support for their children. Furthermore, institutions should increase opportunities for internships and extracurricular activities, enabling students to develop leadership skills through practical experiences (Buckley & Lee, 2021). These recommendations not only enhance students' overall competencies but also help them become more competitive in the job market.

Limitations and Future Research

This study primarily focuses on university students in Guangdong Province. While this region has a certain level of representativeness, the findings may not be fully applicable to other regions. Differences in cultural backgrounds, economic development levels, and education systems may influence leadership development among students in various regions. Additionally, this study

used qualitative research methods, which, although providing in-depth analysis, may introduce subjectivity that could affect the generalizability of the results. Future research could incorporate quantitative methods to obtain more comprehensive and generalizable conclusions. Further studies could conduct cross-regional comparative research to explore differences in leadership development among university students across different provinces and cultural contexts. Additionally, future research should consider using longitudinal designs to track the leadership development of university students after graduation, examining how it evolves over time. Moreover, future studies should further investigate the impact of macro-level factors, such as social policies and economic changes, on university student leadership development to provide more comprehensive theoretical and practical support.

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