

## SENSE OF BELONGING AND RETENTION IN HIGHER EDUCATION: AN EMPIRICAL STUDY ACROSS CHINESE UNIVERSITIES

### SENTIDO DE PERTENCIMENTO E RETENÇÃO NO ENSINO SUPERIOR: UM ESTUDO EMPÍRICO NAS UNIVERSIDADES CHINESAS

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**Abstract.** A sense of belonging in university is a crucial factor encompassing appreciation, involvement, and welcoming emotions. University students with a stronger sense of belonging tend to exhibit greater motivation, academic self-assurance, higher academic participation, and better performance. The present study involved 335 participants from 13 academic departments across five universities. For data analysis, the researcher utilized the varimax rotation method to conduct Principal Component Analysis (PCA) as part of the factor analysis. The findings revealed that academic and social engagement independently influence students' sense of belonging and retention. By examining critical disadvantage factors, such as social class, age, and nationality, this research study fills a gap in the existing literature on the relationship between these factors and the sense of belonging and retention in higher education. By providing insights into the significance of a sense of belonging in university, this research study offers practical implications for new researchers, enabling them to explore the potential benefits of fostering a stronger sense of belonging among students. Such benefits include greater motivation, academic self-assurance, increased academic participation, and improved overall performance. Future researchers can Conduct qualitative and longitudinal studies to provide a deeper understanding of the long-term effects of students' sense of belonging on their academic performance, persistence, and overall well-being.

**Keywords:** Belongingness, Retention, Academic Engagement, International students, China.

**Resumo.** Um sentido de pertença na universidade é um fator crucial que engloba apreço, envolvimento e emoções acolhedoras. Estudantes universitários com um sentido de pertença mais forte tendem a demonstrar maior motivação, autoconfiança acadêmica, maior participação acadêmica e melhor desempenho. O presente estudo envolveu 335 participantes de 13 departamentos acadêmicos em cinco universidades. Para a análise de dados, o investigador utilizou o método de rotação varimax para realizar uma Análise de Componentes Principais (PCA) como parte da análise fatorial. Os resultados revelaram que o envolvimento acadêmico e social influenciam independentemente o sentido de pertença e a retenção dos estudantes. Ao examinar fatores críticos de desvantagem, como classe social, idade e nacionalidade, este estudo preenche uma lacuna na literatura existente sobre a relação entre esses fatores e o sentido de pertença e retenção no ensino superior. Ao fornecer insights sobre a importância do sentido de pertença na universidade, este estudo oferece implicações práticas para novos investigadores, permitindo-lhes explorar os benefícios potenciais de promover um sentido de pertença mais forte entre os estudantes. Tais benefícios incluem maior motivação, autoconfiança acadêmica, aumento da participação acadêmica e melhoria do desempenho global. Futuros investigadores podem conduzir estudos qualitativos e longitudinais para proporcionar uma compreensão mais profunda dos efeitos a longo prazo do sentido de pertença dos estudantes no seu desempenho acadêmico, persistência e bem-estar geral.

**Palavras-chave:** Pertencimento, Retenção, Envolvimento Acadêmico, Estudantes Internacionais, China.

## INTRODUCTION

Over the past few years, the number of overseas students seeking admission to institutions in China has steadily increased (Wen, Hu, & Hao, 2018). This trend reflects China's growing status as a global education hub and a preferred destination for students seeking quality education at affordable rates. According to the OECD (2019), the number of international students seeking higher education abroad in 2017 was roughly 5.3 million, significantly increasing from 3.3 million in 2018. Additionally, the Ministry of Education of China reported that in 2018, China hosted 489,200 international students, with the majority of students hailing from Korea, Thailand, and Pakistan (Wen & Hu, 2019). Current research exposed those international

students studying in China contribute to promoting cultural diversity, developing global talent, and enhancing policies and practices.

Additionally, these students tend to support and align themselves with the goals of global common goods (Tian & Liu, 2021). As a result, more international students are being accepted into Chinese institutions, and enrolment from particularly underserved populations, like those from economically disadvantaged origins, distant or regional places, and indigenous communities, has significantly expanded (Falcone, 2019). China's growing economic power, global influence, rich cultural heritage, and advanced education system have made it an attractive destination for students seeking high-quality education and a unique cultural experience (Tian, Lu, Li, & Yin, 2021). Chinese universities offer diverse courses in diverse fields, including science, technology, engineering, medicine, and humanities, providing students ample opportunities to pursue their academic interests (Jiani, 2017). Additionally, many Chinese universities have programs that offer scholarships and financial support for international students, like CSC and Silk Road scholarships, making it easier for them to afford their studies. Overall, the inclination of international students toward Chinese universities is a testament to the growing reputation and global appeal of China's higher education system (Zhang & Liao, 2021).

In contrast to the inclination, international students pursuing higher education in China often face various challenges related to language, culture, and social integration (Zhu, Li, Wan, Li, Sun, Li, & Wang, 2022). Despite the challenges, the current study examines the significance of feeling a sense of belonging within university communities and how it affects academic performance and overall well-being. Belonging is a crucial psychological requirement (Baumeister & Leary, 1995; Maslow, 1968) that helps in establishing and maintaining solid relationships with others (Mauder, 2018), boosts academic motivation, and contributes to success in higher education (Gillen-O'Neel, 2019). In Maslow's Hierarchy of Needs, belonging is considered essential when positioned between basic psychological and safety needs, the desire for self-actualization, and feelings of esteem. Positive and stable affective interactions are necessary to satisfy the need for belongingness, which is linked to health, well-being, and cognitive, emotional, and behavioral processes (Waller, 2020).

It is widely accepted that creating social connections with peers and staff is crucial for students to feel a sense of belonging in educational environments (Pedler, Willis, & Nieuwoudt, 2022). This sense of belonging relates to extraordinary efforts, attention, self-esteem, persistence, and enjoyment of learning activities (Karaman & Cirak 2017). Students' emotional involvement in learning is vital to students' sense of belonging to the educational community (Gillen-O'Neel, 2021), and failing to establish this connection could result in disengagement, lower academic success, and a higher likelihood of dropping out (Wilson, Murray, & Clarke, 2018). Therefore, developing emotional connections with educational institutions is critical, as students who feel a sense of belonging are more motivated to learn than those who feel disconnected (Lawson & Lawson, 2013).

According to Ahn and Davis (2023), having a strong sense of belonging is vital for students to succeed and stay in higher education. This is supported by multiple studies such as Hagerty et al. (1992), Hoffman et al. (2002), and Mahar et al. (2013), who identified five themes associated with a sense of belonging: subjectivity, groundedness, reciprocity, dynamism, and self-determination. Mahar et al. (2013) defined a sense of belonging as a subjective feeling of value and respect from a reciprocal relationship with a shared external referent, such as experiences, beliefs, or personal characteristics. In the university context, a sense of belonging can be described as feeling valued and respected by other students, being a valuable part of the university community, and having a sense of affinity and acceptance within the community (Knifsend, 2018). The emotion of being included and accepted in a particular community or environment is called "a sense of belonging." In their study, Vaccaro and colleagues (2015) offer a comprehensive summary of existing research that emphasizes the significance of students' sense of belonging in the university context.

### **Higher Education and Sense of Belongingness**

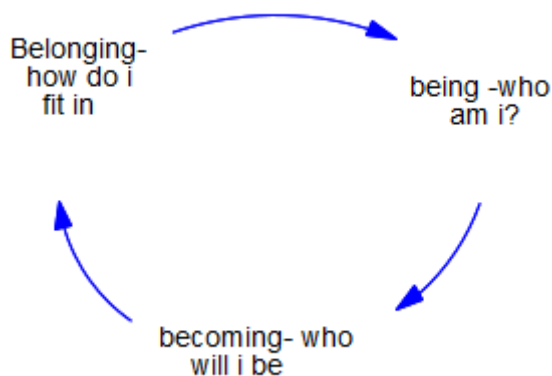
According to various studies (Ahn & Davis, 2023; van Gijn-Grosvenor, & Huisman, 2020; Gillen-O'Neel, 2019; Mauder, 2018), "university belonging" is defined as students' subjective sense of identification with and participation in their institution and campus community. This psychological construct is shaped by how students perceive their educational environment, mainly through interpersonal relationships (Pedler, Willis, & Nieuwoudt, 2022; Yorke, 2016; Mauder, 2018; Murphy and Zirkel, 2015; Slaten et al., 2016). The commonly accepted definition of belongingness in higher education literature, as used in the present study, refers to the perception of a student being appreciated, embraced, and incorporated, as described by Goodenow and Grady (1993). Retention is a factor that represent students

belongingness, it's about students' decisions to continue their education at the same university (Pedler et al., 2022). It's not about how much academic information they remember or retain. Rather, it's about their choice to persist in their academic journey at the institution where they began (Davis et al., 2019). This perspective on retention reflects our broader interest in understanding students' feelings of belonging and how these feelings might influence their long-term commitments to their educational paths (Krause-Levy et al., 2021). Retention, in this sense, becomes an indicator of a student's sustained engagement and satisfaction with their university experience (Knifsend, 2020).

The ability of students to feel a sense of belonging in higher education depends on a variety of factors, including environmental, social, and cognitive aspects that contribute to their connection with their university and their ability to find purpose in their studies and future careers (Karaman, & Cirak, 2017). Transitioning to higher education and the crucial cultural, social, and academic adaptation period can significantly affect students' academic success, social integration, motivation, and the likelihood of dropping out (Meehan & Howells 2019). Although the adjustment of first-year students to higher education is often the focus of research, it is essential to recognize that adapting to higher education continues throughout students' academic careers as they encounter new concepts, practices, and expectations (Knifsend & Juvonen, 2023).

According to Meehan and Howells (2019), a strong sense of belongingness is essential for students to feel connected to their peers and institution. This has been linked to increased academic self-confidence, motivation, engagement, and achievement. Furthermore, Karaman and Cirak (2017) have suggested that a sense of belonging is associated with psychological and socio-emotional advantages, such as enhanced well-being, reduced stress levels, elevated self-esteem, and positive relationships. Failure to establish a sense of belonging could put students at risk of discontinuing their studies. Identifying the factors contributing to this sense could aid researchers in addressing high attrition rates, particularly in the first year of university, as noted by Gillen-O'Neel (2019). Araujo and colleagues (2014) described higher education as an ongoing procedure rather than a one-time. According to them, Students go through various academic, social, and cultural shifts as they transition from their pre-college to post-college lives. They presented a three-stage methodology to foster an academic community among students (Araujo et al., 2014).

The first tier relates to students' connections with their peers and their program, the second pertains to their connections within their school or faculty, and the third pertains to their connections with the global network of their profession or subject area. Kift (2004) argued that belonging results from a complex interplay between three key factors: the environment, social, and cognitive attributes. Together, these factors facilitate students' feelings of connectedness and belonging, supporting them throughout their time at university.



**Figure 1.** Conceptual Framework of Belongingness

The current literature review reveals a research gap regarding the appropriate measurement tool to evaluate the degree of international students' sense of belonging in Chinese higher education institutions. To properly evaluate belonging, a suitable tool must assess it independently while considering various aspects such as academic and social participation, contentment, and continuation. Additionally, demographic elements like socio-economic status, country, age, and living mode should be considered better to comprehend the backgrounds of students in higher education.

Chinese universities have actively promoted internationalization and established partnerships with institutions worldwide, facilitating student exchanges and academic collaborations (Rehman et al., 2022). This has created an environment that fosters cross-cultural interactions and promotes global learning experiences. The presence of international students in Chinese universities has contributed to the diversity of campuses and has also played a crucial role in promoting cultural exchange, mutual understanding, and building international networks. Students from various countries bring diverse perspectives, ideas, and experiences, enriching the academic environment and fostering a global learning community. Chinese universities have recognized the importance of providing support services tailored to the unique needs of international students. They offer orientation programs, Chinese language classes, and resources for adapting to the local culture and education system.

Additionally, universities often have international student offices or centers that assist with visa matters, accommodation, and academic support, ensuring a positive and inclusive experience for international students. The present study aims to explore the intersection of socio-economic status and belongingness among international students in Xi'an, China. By focusing on this specific group, the study aims to contribute to understanding the experiences and challenges faced by international students in the Chinese higher education system. To address these research gaps by utilizing a quantitative approach to investigate queries concerning students' sense of belonging, academic and social engagement, continuation, and recognition from teachers and peers. Moreover, the research aims to scrutinize the influence of these factors on marginalized student groups, particularly those from disadvantaged backgrounds regarding social class, maturity, and nationality. The present study answers the following questions.

Q1. How does students' sense of belonging impact their academic engagement, social engagement, retention, and overall well-being?

Q2. How does the sense of belonging vary among student groups (demographic characteristics)?

### **Theoretical framework**

Sense of Belonging originates from Maslow's (1968) hierarchy of needs, highlighting the importance of "belongingness" for an individual's growth and existence within a community. In the context of K-12 schools, Goodenow (1993) defines a Sense of Belonging as the extent to which students feel personally accepted, respected, included, and supported by others in the school social environment. Hurtado and Carter (1997) describe a Sense of Belonging as a subjective psychological factor that measures a student's subjective feelings of connectedness or cohesion to the institution and the campus community as a whole. Research conducted by scholars in the field of higher education confirms that a Sense of Belonging significantly influences educational outcomes. Studies have shown that within the higher education context, a Sense of Belonging impacts academic and social outcomes (Ahn & Davis, 2023).

### **Psychological Needs Theory**

Psychological needs theory, influenced by self-determination theory, emphasizes the importance of three basic psychological needs for a sense of belongingness: autonomy, competence, and relatedness (Mahar, Cobigo, & Stuart, 2013). When individuals feel autonomous, competent, and socially connected, they are more likely to experience a strong sense of belongingness. The assessment of the need for belonging and acceptance is primarily based on the emotional connection one share with others (Blackhart, Nelson, Winter & Rockney, 2011). The subjective evaluation of fulfilling these needs significantly impacts an individual's psychological well-being, motivation, and overall functioning (Cheryan, Plaut, Davies & Steele, 2009). When these needs are met, they positively influence individuals' self-appraisal, emotions, and behaviors (Gausel and Leach, 2011), contributing to a subjective sense of social connectedness with others (Hagerty & Patusky, 1995) and improved well-being (Hagerty, Williams, Coyne & Early, 1996). On the other hand, if these needs are perceived as unmet or lacking, individuals may experience feelings of rejection (Lambert, Stillman, Hicks, Kamble, Baumeister & Fincham, 2013). leading to a sense of worthlessness (McKenna, Gilmour, Biro, McIntyre, Bailey, Jones & McLelland, 2013) and potentially even depression (Strayhorn, 2018). However, as these needs are fulfilled through our social interactions, the way we present ourselves socially to others (Glass & Westmont, 2014) becomes crucial in balancing our need for belonging and acceptance with the desired social image we want to project (Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992).

## MATERIAL AND METHODS

### Participants and procedure

The present research study aimed to investigate the sense of belonging among international students studying in China, using the descriptive survey design within the quantitative research approach. The study focused on students' perception of belongingness in a community, including campus and residence. The data was collected from five highly-regarded universities in Xian. Xian, being an educational and cultural hub, boasts some of the country's top institutions, ensuring a high standard of academic input in the responses. The questionnaire was administered to students in different courses, such as Engineering, Medical, Social Sciences, Humanities, and Language. For data analysis, the researcher utilized the varimax rotation method to conduct Principal Component Analysis (PCA) as part of the factor analysis. The varimax rotation method is widely accepted in exploratory factor analysis (EFA) to simplify and interpret complex data patterns by utilizing the varimax rotation method. The study aimed to maximize the interpretability of the factors derived from the PCA, ensuring that the resulting factor structure accurately represented the underlying relationships within the data.

### Survey Development

The survey was developed using 24 items to assess the sense of belonging, academic engagement, confidence, confidence socialization and acceptance. The survey included items from three previous studies to ensure content validity. The sense of belonging component comprised six items adopted from Johnson's (2022) study, whereas the academic engagement component utilized six items from Yorke's (2016) study. Similarly, the respect and acceptance from peers and teachers included 12 items from Chen et al.'s (2001) research. The response format for each item was a five-point Likert scale ranging from strongly disagree to strongly agree. The survey covered five scales: a sense of belonging, academic engagement, acceptance from teachers and peers, self-confidence, and socialization and retention and support. Overall, the survey development process aimed to ensure a comprehensive and valid instrument to measure students' experiences and perceptions in different aspects of their academic lives. The study's construct validity was established by using previously validated scales (see Table 1). Demographic questions were also included in the survey to collect information on participants' age, gender, nationality, study major, student statuses, and socio-economic status, such as types of accommodation, co-habitants, academic schools, and scholarship status. The survey also included questions regarding participants' satisfaction with their academic life and thoughts on endorsing the university environment. A complete list of the survey questionnaire is provided in Table 1.

**Table 1.** Construct validity of the survey.

Sense of Belongingness scale	Mean	SD	Cronbach alpha
Social acceptance	29.6	5.5	0.72
Academic engagement	9.7	3.8	0.82
Confidence	10.6	3.9	0.85
Sense of belonging	9.5	4.6	0.83

### Data Collection

Data were gathered from three universities known for accommodating international students. In order to collect information, a questionnaire was distributed to a total of 500 students. WeChat, the widely-used social media platform in China, was chosen as the distribution channel due to its popularity and convenience among the student population. A purposive sampling was employed to gather data from 500 students; only 335 international students from 13 academic departments responded to the questionnaire. The sampling period spanned from November 2022 to March 2023. Purposive maximum-variation sampling was used to ensure diversity among the participants, including mature students, recipients of scholarships such as the CSC, international students from various backgrounds, and those studying in English medium programs.

To overcome challenges related to low response rates, participants were approached during scheduled lectures in modules that had a high number of students meeting the desired criteria. Throughout the recruitment process, ethical considerations were thoroughly discussed with the participants. They were assured that their involvement in the study was voluntary and that their data would be treated confidentially. The College Ethics Committee granted ethical approval for this research project.

## Participants

In the current study, a comprehensive examination was conducted to assess the demographics of the participant pool. The data was collected from 335 students, of which the male and female participants were 238 (70.6%) and 97 (28.8%). The age range of the participants was between 18 and 37 years old, with the majority of the participants, about 110 (32.6%), falling into the 18-25 age range, making them the youngest cohort. The 24-35 age range had the second largest number of participants, about 130 (38.6%), followed by the 26-40 age range with 60 participants (17.8%) and the 30-37 age range with 35 participants (10.4%).

Moreover, the data revealed that the largest group of participants came from the engineering school, with 159 participants (47.2%). In contrast, the smallest group came from the Humanities and Arts group, with only 5 participants (1.5%). Most participants mentioned themselves as Asian, with 317 participants (83.4%). Additionally, 84 (24.9%) identified as African, and 17 (5.0%) were from EU countries. Interestingly, only one student (0.3%) in the sample identified as an American. When considering the living arrangements of the participants, the data showed that 185 students (54.9%) lived on campus, while 150 students (44.5%) rented apartments outside of the university. Further analysis revealed that of the 150 students who lived outside the university, 7 (2.1%) lived alone, 121 (35.9%) lived with friends, and 22 (6.5%) lived with a family. Lastly, regarding financial support, most participants were self-financing their degrees in Xian, with 110 students (32.6%). However, 78 students (23.1%) were receiving the CSC Scholarship for their degree, 133 students (39.5%) were receiving a university scholarship, 14 students (4.2%) were receiving a partial scholarship, and 110 (32.6%) students were self-financing their degree in Xian. Table 2 contains a comprehensive overview of the demographic information. This data set includes all relevant details necessary for a complete understanding of the subject matter.

**Table 2.** Demographic profile of survey participants

Variables	N=335 (%)
Gender	Mean 1.29, SD 0.454
Male	238(70.6%)
Female	97 (28.8%)
Age	Mean 2.06, SD 0.962
18-25	110(32.6%)
25-35	130(38.6%)
35-40	60(17.8%)
40-45	35(10.4%)
Academic disciplines	Mean 1.97, SD 0.965
Medical	110 (32.6%)
Engineering	159(47.2%)
Social sciences	46(13.6%)
Humanities and arts	5(1.5%)
Language	15(4.5%)
Nationality	Mean 1.36, SD 0.593
Asians	233(69.1%)
Africans	84(24.9%)
Europeans	17(5.0%)
Americans	1 (0.3%)
Living mode	
On campus	185(54.9%)
Off campus	150(44.5)
Co-habitant	
Alone	7(2.1%)
With friends	121(35.9%)
With family	22(6.5%)
Financial aid	
CSC scholarship	78(23.1%)
University scholarship	133(39.5%)
Partial scholarship	14(4.2%)
Self-financed	110(32.6%)

## RESULTS

Sense of belongingness, respect, social and academic engagement.

The varimax rotation method was employed to conduct principal component analysis (PCA) on a group of 24 items in the present study. Initially, variables with weak correlations were excluded, and 22 of the most relevant items were selected. To ensure the appropriateness of the analysis, the Kaiser-Meyer-Olkin measure was utilized, yielding a KMO value of 0.85, with all individual item KMO values exceeding 0.62, demonstrating high acceptability. Six factors were extracted based on the eigenvalues, satisfying Kaiser's criterion of 1 and collectively accounting for 81.509% of the variance. The factor loadings post-rotation is presented in Table 3.

**Table 3.** Principal component analysis results in PCA (N = 335).

	<b>Sense of Belongingness</b>	<b>Academic Engagement</b>	<b>Acceptance From Peers and Teachers</b>	<b>Self-Confidence</b>	<b>Socializing</b>	<b>Retention And Support</b>	<b>Communalities</b>
Feeling at home in a university environment	0.96						0.57
Being at university is enriching	0.74						0.68
Strong belongingness	0.63						0.57
Welcoming department	0.70						0.70
Life satisfaction		0.92					0.73
Strong expectation		0.83					0.69
Motivated towards study		0.72					0.58
Making connection		0.80					0.53
Trying better		0.57					0.37
Working hard		0.59					0.49
More effort	0.45	0.76					0.65
Self-reflection			0.88				0.63
Working with others			0.97				0.56
Supportive fellow students				0.64			0.44
Communication				0.75			0.60
Taking classes				0.59			0.63
Students' union					0.79		0.59
Socializing with friends					0.76		0.43
Self-confidence					0.69		0.72
Future					0.59	-0.43	0.58
Job			0.43			-0.76	0.53
Degree completion						-0.68	0.66
Successfulness						-0.56	0.63
Reward						-0.43	0.67



The items clustered together on the same factor indicated that Factor 1 represented a sense of belongingness, Factor 2 represented engagement, Factor 3 represented acceptance from teachers and peers, Factor 4 represented confidence building, Factor 5 represented socializing, and Factor 6 represented retention and support. All six factors demonstrated moderate reliabilities (Cronbach's  $\alpha$  between 0.59 and 0.83). Factor 1 is a sense of belongingness, including items related to feeling at home in the university, general life satisfaction, student life satisfaction, and trustworthiness towards others. Factor 2, engagement, reflected active participation in academic activities and involvement in study programs, projects, and research. Factor 3, acceptance from teachers and peers, reflected how participants perceived their teachers' and peers' value, respect, listening skills, and understanding of different perspectives. Factor 4, self-grooming and building confidence, represented self-progress, while Factor 5 related to academic engagement. Factor 5, socializing, reflected the frequency and satisfaction of social gatherings, face-to-face and through social networking services, among friends and during university trips. Finally, the sixth factor - retention and assistance, comprised the extent to which participants received backing from their academic institution and university, encouragement from peers, and the probability of social interaction with them.

The subsequent step involved performing a correlation analysis to investigate the relationship among the six factors. From Table 4, it was observed that Socializing is positively correlated with retention and support (0.249\*\*) and acceptance from teachers and peers (0.157\*\*). No significant correlations are observed between socializing and self-confidence or academic engagement. Acceptance from teachers and peers is positively correlated with retention and support (0.113\*) and socializing (0.147\*\*). No significant correlations are observed between acceptance and self-confidence or academic engagement. No specific correlation coefficients are provided in the table for self-confidence. The column is left blank, indicating no correlations were examined or found for self-confidence with the other variables in this analysis. Academic engagement is positively correlated with retention and support (0.207\*\*) and negatively correlated with a sense of belongingness (-0.242\*\*). No significant correlations are observed between academic engagement and socializing or acceptance from teachers and peers. Sense of belongingness is negatively correlated with retention and support (-0.379\*\*) and academic engagement (-0.242\*\*). No significant correlations are observed between a sense of belongingness, socializing, or acceptance from teachers and peers.

**Table 4.** Result of Correlation between six factors

	Socializing	Acceptance From Teachers and Peers	Self- Confidence	Academic Engagement	Sense Of Belongingness
Retention and support	0.249**	0.113*	0.111**	0.207**	-0.379**
Socializing			0.157**		-0.256**
Acceptance				0.147**	-0.244
Self-confidence					
Academic engagement					-0.242**

\* At the 0.05 level (2-tailed) Correlation is significant

\*\* at the 0.002 level(2-tailed) Correlation is significant

The outcomes presented in Table 4 demonstrate that factor 1, which pertains to the sense of belongingness, is significantly linked to factor 6, which relates to retention and support. The correlation coefficient of this association is the highest among all six factors ( $r = -0.379$ ,  $p < 0.01$ ). Besides, the sense of belongingness is correlated with four other factors, except for self-confidence, while retention and support are associated with all five factors. Furthermore, factor 2, which refers to academic engagement, and factors 3 and 5, denoting acceptance from teachers and peers, respectively, are positively related to a sense of belongingness, retention, and support. There is no significant correlation between factor 5, which measures socializing, and factors 2 and 6, which measure academic engagement and retention and support, respectively.

## Demographic characteristics and socio-economic position

The present study explored potential variances between two participant groups, young and mature, in six different factors. An independent-samples t-test was conducted with a requirement of a sample size greater than 35 for test efficacy (see Table 5 for details).

**Table 5.** Descriptive analysis of demographic and socio-economic indicators.

M (Sd)	Socialization	Academic Engagement	Retention and Support	Belongingness
<b>Gender</b>				
Male	4.18(0.736)	4.02(0.762)	4.06(0.980)	4.04(0.983)
Female	3.96(0.765)	4.01(0.751)	3.98(1.831)	4.01(0.996)
<b>Age</b>				
18-25	4.27(0.851)	3.89(0.971)	4.08(0.978)	3.90(1.973)
24-35	4.22(0.739)	4.01(0.870)	4.09(0.983)	4.00(0.886)
26-40	4.14(0.733)	4.03(0.972)	3.92(0.983)	4.13(1.001)
30-37	3.98(0.754)	4.13(1.003)	3.14(0.988)	4.19(0.920)
<b>Nationality</b>				
Asians	4.31(0.864)	4.10(0.823)	4.41(0.982)	4.11(0.991)
Africans	4.09(0.873)	4.08(0.85)	3.91(1.088)	4.03(0.981)
Europeans	3.98(0.967)	4.02(0.890)	3.14(0.898)	4.04(0.985)
Americans	4.42(0.998)	3.99(0.982)	3.52(0.878)	3.96(1.021)
<b>Accommodation</b>				
On campus	4.02(0.762)	3.94(0.911)	4.11(0.891)	4.04(0.878)
Off campus	4.07(0.757)	4.04(0.874)	3.92(0.891)	4.01(0.989)
<b>Co-habitants</b>				
Alone	3.96(1.031)	4.14(0.984)	4.03(0.989)	4.10(0.833)
Friends	4.05(0.785)	4.11(0.986)	4.13(1.001)	4.04(0.983)
Family	3.98(0.861)	3.83(0.978)	3.98(1.045)	3.91(1.073)
<b>Financial support</b>				
Full Scholarship	4.13(0.743)	4.02(0.762)	4.41(0.991)	4.27(0.953)
Partial	4.02(0.783)	4.02(0.781)	3.89(1.521)	4.03(0.896)
Self-finance	4.06(0.731)	3.99(0.991)	3.14(0.891)	3.69(0.9871)
<b>Academic discipline</b>				
Medical	4.04(0.943)	4.10(0.987)	4.06(0.921)	4.13(1.002)
Engineering	4.02(0.921)	3.83(0.923)	4.27(0.931)	4.43(0.977)
Social sciences	4.03(0.932)	3.64(1.064)	4.12(0.981)	4.10(0.975)
Humanities and arts	3.92(0.962)	3.14(0.878)	4.08(0.993)	3.91(1.056)
Language	4.06(0.982)	3.91(1.089)	4.10(0.834)	3.32, (0.831)

The findings showed that there were no age-related differences in factor 6 (retention and support) and factor 1 (sense of belongingness, as evidenced by the results of the t-tests ( $t(362.47) = -0.19$ ,  $p = 0.89$  for factor 6;  $t(316.78) = 0.59$ ,  $p = 0.59$  for factor 1). Similarly, the type of accommodation (on-campus and off-campus) and sex (male and female) did not reveal any notable disparities for factors 1 and 6 ( $t(234.15) = -0.17$ ,  $p = 0.87$  for factor 1;  $t(213.32) = -0.89$ ,  $p = 0.39$  for factor 6) and ( $t(33.71) = -0.13$ ,  $p = 0.91$  for factor 1;  $t(35.99) = 2.32$ ,  $p = 0.07$  for factor 6), correspondingly. Nonetheless, the only aspect that demonstrated a significant variation in academic engagement was gender ( $t(201.98) = 2.55$ ,  $p < 0.05$ ).

Regarding nationality, the investigation was conducted using four indicators, namely Asians, Africans, Europeans, and Americans. Statistical analysis indicated that both well-being (factor 1,  $t(259.10) = -2.97$ ,  $p < 0.01$ ) and retention and support (factor 6,  $t(263.67) = 3.91$ ,  $p < 0.01$ ) exhibited noteworthy variances depending on national identity. In addition, the student status indicator revealed a significant difference only in support and belonging (factor 6,  $t(46.47) = -2.37$ ,  $p < 0.05$ ). Additionally, considerable variations in social interaction (factor 5) were noticed based on the student's status and nationality. According to the data presented in Table 4, individuals who identify as Americans are more likely to consider as social ( $M = 4.42$ ,  $SD = 0.998$ ) and report a lower sense of belonging ( $M = 3.96$ ,  $SD = 1.021$ ), along with lower levels of academic engagement and financial aid ( $M = 3.99$ ,  $SD = 0.982$ ), compared to Asian students (belongingness  $M = 4.10$ ,  $SD = 0.823$ ). This suggests that American students may face more significant challenges in feeling connected to and supported by their university community, potentially impacting their academic success and retention rates.

The independent samples t-test was used to examine the relationship between financial assistance and accommodation options, specifically concerning socialization (factor 5). The results indicated a significant difference between 'retention and support' or 'acceptance' ( $t(44.93) = 2.69, p < 0.05$ ) and "Living in campus residences" and "off-campus" ( $t(139.48) = 2.65, p < 0.05$ ). The findings of Table 5 demonstrate that individuals residing with their family ( $M = 3.980, SD = 0.861$ ) or living alone ( $M = 3.96, SD = 1.031$ ) show a lower inclination to engage in social activities at university compared to those residing with their friends ( $M = 4.05, SD = 0.785$ ) or living in on-campus dorms ( $M = 4.07, SD = 0.757$ ). Furthermore, the study also revealed a significant variation in academic involvement (factor 2) among participants who received different levels of university scholarships ( $t(297.65) = 2.05, p < 0.05$ ).

Statistical differences are observed in all socio-economic indicators concerning socializing (factor 2) and moral support (factor 6). Specifically, receiving a CSC scholarship ( $t(311.99) = -2.72, p < 0.01$ ), residing with family ( $t(41.01) = 4.88, p < 0.01$ ), residing off-campus ( $t(109.18) = 5.07, p < 0.01$ ), and living in university dorms ( $t(123.01) = 9.13, p < 0.01$ ) have a significant impact on socializing. Similarly, receiving a university scholarship ( $t(295.23) = -2.16, p < 0.05$ ), living on-campus ( $t(43.38) = 3.18, p < 0.01$ ), receiving a partial scholarship ( $t(157.83) = 0.19, p < .01$ ), and having academic engagement ( $t(110.93) = 4.33, p < 0.01$ ) have a substantial effect on moral support.

An analysis of academic disciplines reveals that the sense of belonging and support (factor 1), academic engagement (factor 2), and socializing (factor 5) among engineering students significantly differ from those of medical students ( $t(127.78) = -4.19, p < 0.01$  for factor 1;  $t(130.77) = 6.67, p < 0.01$  for factor 2; and  $t(121.5) = -3.67, p < 0.05$  for factor 5), as well as social science students ( $t(89.57) = -3.66, p < 0.05$  for factor 1;  $t(97.73) = -5.18, p < 0.01$  for factor 5; and  $t(73.40) = 4.14, p < 0.01$  for factor 2). Moreover, an analysis of Table 4 reveals that students studying language exhibit the most minor level of sense of belongingness ( $M = 3.32, SD = 0.831$ ), as compared to the engineering student cohort ( $M = 4.43, SD = 0.977$ ), exhibiting a significant gap of 1.11.

#### Discussion

The principal component analysis (PCA) conducted in this study revealed the presence of six factors that collectively accounted for 81.509% of the variance. These factors were identified as a sense of belongingness, engagement, acceptance from teachers and peers, self-confidence, socializing, and retention and support. Each factor consisted of related items that captured different aspects of students' experiences in a university environment. The reliability analysis indicated moderate reliabilities for all six factors. Factor 1, representing a sense of belongingness, included items related to feeling at home in the university and overall life satisfaction. Factor 2, engagement, reflected active participation in academic activities. Factor 3 captured acceptance from teachers and peers, while factor 4 represented self-confidence. Factor 5 was related to socializing, and factor 6 represented retention and support from the academic institution and peers.

Correlation analysis was conducted to examine the relationships among the six factors. The results showed that socializing was positively correlated with retention and support and acceptance from teachers and peers. Acceptance from teachers and peers also showed positive correlations with retention and support, and socializing. No significant correlations were found between socializing and self-confidence or academic engagement. Academic engagement was positively correlated with retention and support but negatively correlated with a sense of belongingness. Sense of belongingness was negatively correlated with retention and support, and academic engagement. These findings suggest that factors such as socializing, acceptance from teachers and peers, and academic engagement are interrelated and play a role in students' sense of belongingness and retention in the university. The study also explored potential differences in the factors based on demographic characteristics and socio-economic positions. The results indicated no significant age-related differences in the sense of belongingness and retention and support factors.

Similarly, no notable disparities were found based on accommodation type and gender for these factors. However, gender showed a significant difference in academic engagement. Nationality revealed significant variances in belongingness, retention, and support. Additionally, socio-economic indicators such as financial assistance, accommodation options, and academic disciplines were found to significantly impact factors such as socializing, academic engagement, and moral support. These findings highlight the importance of considering demographic and socio-economic factors in understanding students' experiences and support systems within the university setting.

This study provides insights into the factors influencing students' experiences in a university environment, highlighting the importance of a sense of belongingness, engagement, acceptance from teachers and peers, self-confidence, socializing, and retention and support. Understanding these factors and

their relationships can contribute to developing interventions and support mechanisms to enhance students' well-being and academic success. This discovery corresponds with various past investigations, indicating that students' feeling of being a part of their college or university is mainly influenced by their academic and social engagement. Furthermore, it reinforces the widely agreed-upon view that a positive correlation exists between a student's sense of belonging and academic success (Thomas, 2021; Ahn & David, 2020; Subedi, 2022).

Notably, participating in social activities does not necessarily influence academic performance. It is suggested that social and academic activities are independent and should be addressed as separate entities (Rehman et al., 2023). This implies that participating in social activities may not necessarily impact academic performance. These findings are consistent with our previous conceptual and qualitative analyses presented by Ahn and Davis (2019). In this study, we identified social engagement as encompassing a broad range of activities in the higher education context for international students, including participation in student clubs, English corners, frequency of engagement, and the social networks with whom they interact. We also measured the level of academic engagement and its relationship to students' social lives. Both the Winstone et al. (2022) study of higher education institutions and Knifsend's (2018) quantitative research in the USA highlight the importance of participation in extracurricular activities.

Moreover, quantitative research on American college students found a significant relationship between social engagement, belonging, and retention using Tinto's theory (1987) to quantify belonging (Ahn & Davis, 2020). Interestingly, socializing (factor 5) is the only element where age, ethnicity, academic fields, and other socio-economic indicators differ. Those who receive partial scholarships and are members of underprivileged groups are less likely to partake in various social activities and more likely to be unhappy with their social lives. The value of academic engagement, particularly among academic staff, has been supported by recent quantitative studies on students' academic experiences in Romania (Karaman & Cirak, 2017), Australia (Ahn & Davis, 2020), and the USA (Soria and Stebleton, 2012). They emphasized the importance of academic connection with faculty members for students' sense of belonging.

Upon additional analysis of different demographic and socio-economic factors, there were noteworthy discrepancies among specific groups; however, these differences were obscured in the overall data. Those participants who live alone or with family (off campus) are less socialized than those who live alone (on campus) and have friends. On the other hand, students who live on the campus have more sense of belongingness than students who live with family. Moreover, students who received fully funded scholarships had a strong sense of belonging and were more involved in academic activities. The findings confirm prior research on the relationship between students' accommodation types (Ahn & Davis, 2023; Briggs, Clark, & Hall, 2012), social class (van Gijn-Grosvenor, & Huisman, 2020), and their negative Correlation with a sense of belonging.

Although demographic characteristics were found to have less impact on belonging and retention in this study, students' socio-economic status was deemed essential (Chow, 2007). The study discovered no significant differences in belonging and retention among groups based on age, gender, and academic discipline. However, this might be due to the process being less visible and less directly causal. In academia, it is crucial to avoid plagiarism and use proper citation techniques to acknowledge the sources of one's ideas. Thus, the following is a revised version of the paragraph that removes plagiarism and improves academic writing:

Scholarships can significantly impact students' level of engagement in their academic pursuits. In contrast, those without scholarships, including those with additional commitments like family, financial obligations, and work responsibilities, are likelier to be less engaged, irrespective of age. Despite arguments by particular academics that mature students possess superior abilities to manage academic stress due to their life experiences, as posited by Rainey et al. (2018), the findings from research remain equivocal. Specifically, the role of demographic and socio-economic variables in shaping students' sense of affiliation and disengagement from tertiary institutions has not received adequate scholarly attention. It has been found that mature students exhibit less socialization but a stronger sense of belonging, perhaps because they are mostly Ph.D. and post-doc students involved in research projects. Further research is, therefore, necessary to fully understand the complex relationship between these factors and students' experiences in higher education (Mooney & Becker, 2021).

Their national identity and academic disciplines can influence belongingness and retention among international students. Research has shown that students who identify as Asian or African or study engineering and social sciences tend to feel a greater sense of belonging, receive full scholarships, and live with friends and family. Conversely, language students often feel less belonging, are typically young, and

are less likely to receive scholarships. While studies on European and Australian students in higher education are abundant, there is a lack of research on international students in China. To better understand this population, it is essential to consider their national identity and academic disciplines.

It is essential to conduct more research to determine how international students' varied demographic and socio-economic origins affect their participation in academia and society in China, with a particular emphasis on their sense of belonging to Xi'an educational institutions. This is important for their sense of cultural identification, community, and ability to move around socially and geographically. Examining institutional circumstances, including educational philosophy, disciplinary organization, and vocational orientation, is crucial. In the future qualitative research can be done to explore the real stories of international students and their sense of belongingness.

The presented study is limited to five Chinese universities and has found significant differences in students' sense of academic engagement, socialization, acceptance, and belonging depending on their circumstances. Yet, because some students may progressively develop their sense of belonging over time, conducting a longitudinal study incorporating a qualitative approach for in-depth exploration is suggested.

It is critical to look into the academic staff's feeling of community because this can impact students, especially if they feel alienated.

## CONCLUSION

This study looked into the connection between academic and social engagement and a sense of belonging among international university students in China. The study's findings indicate that more senior students, although less socially active than their younger counterparts, demonstrate a higher sense of belonging. Also, it was discovered that both social and academic involvement play separate roles in promoting students' sense of belonging in higher education.

These results emphasize the value of providing international students with a welcoming living environment, especially in terms of transportation and accommodation, to promote social interaction that enhances their sense of belonging at the university. Highlighting the role of social involvement is essential element in higher education. So, it is crucial to truly understand how belonging impacts academic success and students sticking around. Given the crucial role of international students in higher education, universities must ensure that their environment fosters social and academic engagement to promote academic success and well-being.

Therefore, university administrators can use this study's findings as a valuable resource to develop strategies that address international students' unique needs, leading to higher retention rates and academic achievements. This research highlights the importance of creating a supportive environment for international students that promotes academic and social engagement. Universities prioritizing students' sense of belonging will benefit from increased retention rates and create a welcoming environment that encourages students to thrive academically and personally. Future studies can build on these findings by exploring the impact of specific interventions and programs that promote social engagement among international students.

To foster a positive academic experience, it is essential for students to feel a sense of belonging within their academic community. This includes both academic and social engagement, as well as a feeling of acceptance and confidence. To achieve this, educational institutions should prioritize creating a supportive and inclusive environment for all students, regardless of their background or personal circumstances.

By encouraging a sense of belonging and providing resources to support students' academic and personal growth, institutions can help students to thrive and succeed in their academic pursuits. It is also essential to acknowledge and address any systemic barriers or biases that may hinder certain students' sense of belonging and to actively work toward creating a more equitable and inclusive academic community.

## DECLARATION

### Availability of data and materials

All data used in this study will be available on request.

### Competing interests

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and publication.

### Informed consent

For the present study, informed consent was obtained, and all participants provided written consent. Additionally, the ethics committee reviewed and approved the need for consent.

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### Ethics Approval Statement:

This study was approved by the institutional review board and followed ethical guidelines for protecting human subjects.

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