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Exploring the Relationship between Student Engagement and Role of Career Adaptability to Enhance Employability of University Graduates

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ABSTRACT

This study investigates the relationship between student engagement, career adaptability, and the employability of university graduates. Utilizing a quantitative research design, data were collected from 450 undergraduate and postgraduate students at two universities in Guangzhou, China. Regression analysis was conducted, and statistical package of social science (SPSS) software was employed to examine the impact of key variables, including career adaptability, transferable skills, social support networks, and student engagement, on employability outcomes. The results indicate a significant positive relationship between career adaptability and successful workforce transition, suggesting that graduates with higher adaptability are better prepared for the job market. Transferable skills gained through higher education were also found to have a substantial impact on employability across various industries. Furthermore, social support networks, both within and outside the university, were shown to positively influence graduates' career development and job acquisition. The findings underscore the importance of integrating career adaptability training in universities by emphasizing the development of transferable skills and strengthening social support networks. Additionally, fostering student engagement through academic and extracurricular activities is crucial. The study concludes that a comprehensive approach that incorporates these elements can significantly enhance the employability of university graduates, enabling them to meet the demands of the modern workforce.

Keywords: Employability; University Graduates; Career Adaptability; Transferable Skills Social Support; Student Engagement

1. INTRODUCTION

Policymakers, schools, and employers are increasingly concerned about the employment rate of university graduates in the current and future international dynamic economy (Guo et al., 2014; Zhang et al., 2021). Career options for university graduates involve four major components, which include career adaptability, transferable skills, social support, and student engagement (Khoso et al., 2022). One of the components, career adaptability, caters to an approach with goal commitments, problem-related coping, and behavioral flexibility, or a client's readiness and ability to manage change (Coates, 2007). Rudolph et al. (2017), demonstrated that students with high career adaptability levels find jobs more readily and progress within their career paths more successfully.

Career adaptability is a significant predictor of employability, suggesting a significant relationship between career adaptability and university graduates' achievement of satisfactory entry-level positions. At the same time, it is important not to underestimate the value of transferable skills those universally applicable abilities that are useful across different roles and fields. The current employment world has deemed desirable social skills such as communication skills, problem solving, teamwork, and computer skills (Panigrahi et al., 2018). Jackson & Tomlinson (2020) pointed out that the acquisition of soft skills during higher education is helpful in improving the employability of the graduates.

Furthermore, a number of factors, including internal and external social support structures, are significant in shaping graduate outcomes in terms of career buildup and employment. These networks are social assets that can offer emotional, informational, and instrumental support necessary for career advancement and career prospects (Bouchrika et al., 2019). In a university setting, the role of faculty, career services, and peers is critical in preparing students for career placements and job search activities. Faculty, career service centres, and peers all play significant roles in enhancing students' readiness for these endeavours (Baluku et al., 2021). As a result, family and friends play a critical role in building graduates' morale and encouraging them to consider possible career paths. In addition to this, other external factors, such as professional mentors and other role models who have graduated and are already in the workforce, boost graduates' employment prospects by giving them recommendations and chances to advance in their career (Green et al., 2020).

Jackson and Tomlinson (2020) postulate that academically engaged students are more productive, possess relevant competency, and have better job search practices than their counterparts. Scholars widely understand that student engagement enhances the likelihood of transitioning from university to the workforce, with previous research demonstrating a direct correlation between engagement levels and employability. The integrated framework of employability relies heavily on factors such as career adaptability, transferable skills, length and support, engagement, and employability to ultimately improve graduate outcomes. Employability frameworks must include career adaptability, transferable skills, social and student support, and student engagement (Parola & Marcionetti, 2022).

However, with increasing higher education coverage and an expanding number of graduates joining the work force, a'mismatch' between the skills graduates possess and the skills employers seek remains a concern (Liu et al., 2020). Therefore, there are many issues that this research focuses on, namely the deficits in career adaptability, the absence of transferable skills, the shortage of social support requirements, and the concerns about the level of relationship with the students. Dealing with these factors necessitates an understanding of how they affect employability. According to research, career adaptability positively impacts career outcomes and enhances personnel's employability by enhancing their capacity to handle change and workplace demands (Magnano et al., 2021).

Previous studies have analysed these elements in isolation, disregarding the intertwining and cumulative outcomes that they have on employability (Lee et al., 2021; Ma et al., 2021; Rivera et al., 2021). Given this research gap, the study will adopt a comprehensive approach to the analysis of these factors, aiming to bridge this gap in the literature and provide insight into how these various factors interact and influence graduate outcomes. This integration is crucial in enhancing teaching and learning practices as well as policies that are relevant to the present-day competitive job market (Monteiro et al., 2020). These changes necessitate redefining dimensions of employability in order to prepare graduates for work.

We seek this re-orientation to inspire relevant skills and attitudes in the graduates for the complex world of work (Zhong et al., 2021). This enlightenment came from an understanding of the rising difficulty that university graduates encounter in the job market. The competitive economic world affects their employment opportunities. While the number of universities and colleges has significantly increased, allowing for higher enrolment and graduation rates, graduates find it difficult to move from the classroom to the workplace, thus questioning the efficiency of conventional learning models. This research is unique for its multifaceted view of career adaptability, transferable skills, social support, and student engagement, and how they impact employability. This work, therefore, contributes to the current literature by examining the influence of these variables among graduates from two universities in Guangzhou, a fast-growing city in China.

This research makes a theoretical contribution by realizing that the aspects of employability are indeed interrelated in a complex manner, and the practical implication of this knowledge may be beneficial for universities and policymakers in order to enhance students' employability prospects. In the context of career construction theory, the aspect of career adaptability has received significant attention, with direction, control, curiosity, and confidence emerging as pivotal adaptability resources in career development (Hamzah et al., 2021). Social capital theory anchors the function of social support, asserting that individuals possess certain relational assets that enable them to access societal resources and opportunities (Zhang et al., 2021). Shenoy et al. (2020) utilized the social capital theory to capture a graduated employability process and map out how internal and external ties facilitate career outcomes.

2. LITERATURE REVIEW

2.1 Students Engagement and Career Adaptability

Career adaptability is an essential concept for understanding how young people cope with the current intimidating and competitive world of work. Career adaptability, defined as the ability and preparedness to tackle current and anticipated career development challenges, changes, and crises, is considered a crucial factor in determining career success (Chui et al., 2022). Researchers have extensively investigated the phenomenon of career adaptability, suggesting that individuals with high adaptability have more opportunities for career mobility, which in turn leads to improved career outcomes (Li et al., 2021). The literature in the field of career construction theory laid the foundation for characterizing career adaptability. Besides, this theory holds that the self-architecture constitutes an entity, making it expeditious to enter the profession voluntarily and proactively.

It creates a career out of current opportunities based on the self-concept, which changes with experience and contextual information processing. Career adaptability in this context encompasses four key dimensions: concern, control, curiosity, and confidence. We can view these as the major dimensions of adolescent concern. Altogether, these dimensions help the students to consider the potential future demands of the occupation (concern), to assume the primary accountability for their career trajectory (control), to examine possible selves and career paths (curiosity), and to advance towards the career objectives with confidence and efficiency (Kengatharan, 2020). Santilli et al. (2020a) provided significant evidence that career adaptability has a positive correlation with career satisfaction and perceived employability, which makes a lot of sense since individuals with higher extroverted career adaptability are more likely to have better career results. Various contexts and groups have explored the concept of career adaptability in describing and promoting the process of transitioning from education to employment.

Rasheed et al. (2020) established career adaptability as a way to positively predict career success among Swiss adolescents, which supports the multifarious applicability of this concept. Numerous studies have sought to explain how career transition impacts the various mechanisms of career optimism (Boo et al., 2021; Monteiro et al., 2020; Santilli et al., 2020b). One of the significant mechanisms is the increase in job-search-related behaviors. A study also shows career adaptability involves active job seeking behavior amongst the candidates, such as networking, resume writing, and interview practice (Ocampo et al., 2020). Scholars have also discussed how schools and career counseling teach career adaptability skills. Researchers have found that various educational programs, including internships, career activities, workshops, and mentoring systems, effectively enhance students' career adaptation competencies (Bartley & Chen et al., 2020).

Career counselling primarily focuses on these four distinct aspects of career adaptability, while also significantly enhancing students' readiness for the job market. Therefore, despite the clear relevance of career adaptability and its crucial role in defining a successful career transition, several questions remain unanswered. For instance, the globalized job market and the exploration of cross-cultural career adaptability are unexplored research topics that could lead to the development of universally effective methods (Zhang et al., 2023). Furthermore, qualitative designs that track graduates' career experiences and growth years after graduation could provide a more comprehensive understanding of the long-term impacts of career adaptability. Thus, the following hypothesis is postulated:

H1: There is a positive relationship between students' engagement and career adaptability.

2.2 Transferable Skills and Career Adaptability

As for the key competencies in the learning process, communication, problem solving, teamwork, and information technology competencies predict the different prospects for jobs and industries' challenges effectively (Liu et al., 2023). Research interest in the relationship between transferable skills and employment has been growing for a long time, indicating that transferable skills are undeniably capable of boosting university graduates' job prospects. It is imperative at this stage to define transferable skills, which are the skills that can be utilized in various employment settings and are not necessarily bound to a particular job or sector (Chen et al., 2020). We sometimes divide these skills into thinking skills, social skills, and information processing skills. Critical thinking and problem-solving skills. Relational skills encompass the ability to communicate effectively and collaborate effectively in a team. We also refer to technical skills, like computing skills, as transferable skills. The focus on transferable skills corresponds well with the trends in satisfying complex skill demands influenced by the fluidity of roles and organizational boundaries (Kengatharan, 2020).

Studies have established that the development of transferable skills during higher education has a direct impact on graduates' employability. Huang et al. (2022) conducted research among the Australian business graduates and identified that employers attract abilities like communication, teamwork, and problem solving. The study revealed that graduates possessing these skills were more likely to secure jobs and could advance in their roles. Kim and Shin (2020), for the same reason, studied the employability of graduates in the UK and Europe and discovered that transferable skills emerged as key predictors of career outcomes, irrespective of occupational disciplines.

Jia et al. (2022) identify group projects, internships, and service-learning activities as the active learning strategies that can enhance these essential skills. These learning options provide students with invaluable exposure and the opportunity to apply the acquired knowledge. For instance, group projects help to encourage teamwork and develop communication skills, while internships provide students with practice in the professional environment and the ability to strengthen their competencies (Abid et al., 2021; Kaushik & Agrawal, 2021).

H2: Transferable skills have a significant impact on career adaptability.

2.3 Social Support and Career Adaptability

It is crucial for university graduates to have strong social support networks that enable them to achieve favourable career outcomes in their employment prospects. Social support networks such as family and friends, organizational mentors, and other professional associations offer affective, informative, and functional support, which can greatly predict one's career trajectory (Delle & Searle, 2022). The curriculum emphasizes the importance of social support networks, especially their impact on career development processes, including job search approaches, career choices, and career advancement (Collie et al., 2020). Therefore, graduates who effectively utilize their social networks have a higher chance of landing a job or receiving a promotion within a specific timeframe (Tani et al., 2021). Within the university context, we can consider interactions with faculty, fellow students, and career centers as forms of social support (Xu et al., 2020).

Career and job seekers benefit from the support from their families and friends because they are people who will encourage them and offer them a hand when searching for a job (Benlahcene et al., 2021). Senior employee mentors can offer valuable organizational information and expertise to their mentees, while professional mentors can offer advice based on practice environments, contacts, and networks, all of which are crucial for career advancement to the next level. According to Liu et al. (2023), graduates who had access to a mentor were more likely to secure employment and receive better promotions than those who did not.

This development is important because succession and career planning ensure adequate preparation, as well as offer knowledge and guidance that can lead to better career prospects (Veluvali & Surisetti, 2022). Job seekers who invest time in building their social support networks are more likely to actively seek jobs, secure employment offers, and secure employment. According to the findings of Adipat et al. (2021), for a senior job seeker, social support helps minimize the stress associated with job search and increases the seeker's motivation, thereby enriching their job search strategies (Tani et al., 2021). Cross-sectional research supports this idea by showing a positive correlation between career success, consistent employment outcomes, and social support systems, particularly when individuals receive support over an extended period of time (Abid et al., 2021).

H3: Social support networks, both within and outside of the university, positively impact graduates' career adaptability.

2.4 Career Adaptability and Employability Outcomes

Student engagement is simply defined as learners' participation and attachment to their learning processes, as one of the key factors that can significantly affect students' employability perspectives (Chen et al., 2020).

A correlation between increased levels of student engagement and improvements in academic achievement, job market preparedness, and more efficient job searching skills increase employability (Khoso et al., 2024). In the same year, learners' engagement in activities within and outside the classroom had a significant impact on academic performance. This validates the idea that engagement fosters a favorable learning environment, which in turn enhances performance. Financially engaged students are happier and more involved, and as a result, they enhance employer-oriented features like interpersonal, cooperation, and creative skills (Kengatharan, 2020). For students, participating in group assignments, internships, and organizational leadership positions exposes them to nurture their personal career characteristics, making them actually career-ready (Kaushik & Agrawal, 2021).

The connection between students' engagement and employability outcomes is undeniable. According to a study by the National Survey of Student Engagement (NSSE), students who are more engaged in class, academic, co-curricular, social, or organizational activities are more likely to do well and are perceived to have higher levels of career readiness (Xia et al., 2020). A memorandum of understanding between academic performance/career readiness and job search strategies confirms that student engagement enhances job search strategies. Engaged students are more likely to actively seek employment and utilize a variety of strategies and sources to do so (Geraghty et al., 2020; Khoso et al., 2024).

In addition to the above research on job search self-efficacy, other studies examining the subject also endorse the correlation between student engagement and the aforementioned job search activities. Job searches self-efficacy, which refers to a person's confidence level in undertaking job search activities, is an important and fundamental factor that explains the job search behavior and the resulting job search outcomes (Carvalho & Mourão, 2021). Besides, students essentially demonstrate an implication of student engagement related to the long-term implications of their career satisfaction. Engaged students develop their professional selves and gain direction in their choices, leading to career orientation and enhancing career stability and dexterity (Ma et al., 2023; Oliveira et al., 2023).

H4: Career adaptability enhances employability outcomes, including academic performance, career readiness, and job search strategies.

Figure 1 shows the research model for the present study, indicating an association among study variables. This study will employ a research model that emphasizes the variables of student engagement, transferable skills, social support, career adoptability, and employability cross-path. The model also assumes that the activity levels, generic self-attributes, and resources perceived by the students have a direct and positive relation to their career adaptability and thereby impact employment results.

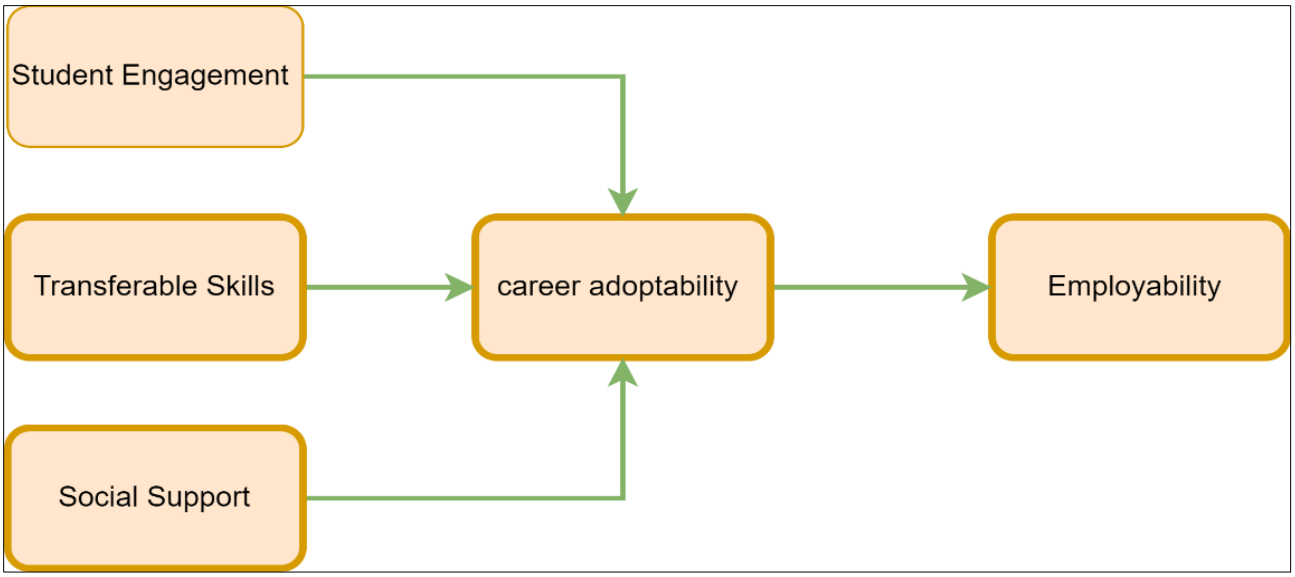

Figure 1. Research Model

3. METHODOLOGY

3.1 Research Design

This study employs a quantitative research design, specifically targeting the relationship between student engagement, career adaptability, transferable skills, social support networks, and employability outcomes among university graduates in Guangzhou, China. We utilized a cross-sectional survey design to collect data from 450 undergraduate and postgraduate students at two universities. A cross-sectional design allows for the examination of the current state of these variables and their interrelationships within this specific population at a single point in time.

We carefully designed the survey instrument to measure each variable using validated scales, ensuring the accuracy and reliability of the data. As it can be stated, student engagement was measured using the student engagement scale, career adaptability was assessed through the career adaptability scale (CAAS), transferable skills were evaluated using a standardized employability skills assessment, and social support networks were gauged through a social support scale. We measured employability outcomes by assessing academic performance, career readiness, and job search strategies among the participants.

3.2 Sample and Data Collection

This study involved a quantitative research design, focusing on both undergraduate and postgraduate students (N = 450) from two universities located in Guangzhou, China. Institution 1 was a smaller university with a strong emphasis on undergraduate education (N = 310), while Institution 2 was a research-intensive university (N = 140). The decision to draw samples from Guangzhou was based on the city's prominent role in China's higher education system and its diverse student population, which mirrors the complexity and dynamism of the broader educational landscape in China (Boo et al., 2021). The sample is representative of the universities' populations, with a fairly balanced proportion of male and female students, the majority of whom are aged less than 30 years. Additionally, approximately one-quarter of the participants were international students.

The study precisely designed an online survey to collect data on key variables such as job preparedness, portfolio development, social support systems, and student involvement. WeChat, a widely used messaging and social media platform in China, conducted the survey, facilitating the detailed collection of quantitative data. This approach helped illustrate how these variables impact the employment outcomes of university graduates. The decision to use WeChat enabled the gathering of data from a wide cross-section of participants, regardless of their location, ensuring an adequate and diverse sample for analysis.

3.3 Instrument Design & Measurement

We carefully selected the measures in this study to ensure the validity and reliability of the constructs under examination. It is linked to parameters such as student engagement, readiness for career change, transferable employability skills, and perceived social support. We derived all the relevant scales mentioned in the previous section from internationally recognized sources in the literature. Essentially, we used Dogan's (2015) scale to assess students' engagement. This scale belongs to the category of the global indexes of student engagement and addresses behavioral, emotional, and cognitive aspects. It is a self-report measure consisting of numerous items operationally defined on a Likert scale, such that the higher the score, the higher the level of engagement. Previous research works have established the reliability and validity of this scale, making it convenient to measure engagement in this research. On the other hand, Maggiori et al. (2017) developed the Career Adaptability Scale (CAAS) to measure career adaptability.

The CAAS measures four dimensions of career adaptability: concern, control, curiosity, and confidence. In other words, the Likert type items' scores operationalize the construct of each dimension. Studies on career development commonly use this scale due to its established psychometric features. It is able to capture the adaptability resources that people employ in order to undertake and address career-related demands and issues. In addition, the participants' transferable skills were assessed using the scale adapted from Alpay and Walsh (2008). It measures some of the general transferable skills, including interpersonal and communication skills, teamwork and collaboration skills, problem-solving skills, and critical thinking skills. Participants self-assessed their level of skill from 1 (‘not at all') to 5 (‘very well'). Given that it aims to determine skills that are transferable across various vocational fields, this measure is particularly useful for assessing employability skills. Finally, Sarason et al. (1983) designed the Social Support Questionnaire (SSQ), which the students completed to assess social support. The SSQ consists of multiple items rated on a Likert scale, capturing both the quantity and quality of social support. The established scale from the literature, as shown in Table 1, demonstrates strong reliability and validity.

Table 1. Measurements of Study

Construct	Scale	Source	Dimensions	Cronbach's Alpha
Student Engagement	Student Engagement Scale	Dogan (2015)	Behavioral, Emotional, Cognitive	0.89
Career Adaptability	Career Adapt-Ability Scale (CAAS)	Maggiori et al. (2017)	Concern, Control, Curiosity, Confidence	0.92
Transferable Skills	Transferable Skills Scale	Alpay and Walsh (2008)	Communication, Teamwork, Problem-Solving, Critical Thinking	0.87
Social Support	Social Support Questionnaire (SSQ)	Sarason et al. (1983)	Quantity, Quality of Support from Family, Friends, Others	0.91

3.4 Ethical Considerations

This study adhered to ethical considerations, given its involvement with human participants. The author's obtained the approval from the Institutional Review Boards (IRBs) of the two universities in Guangzhou prior to data collection. The IRBs reviewed and approved the research objectives, methodology, data collection instruments, and measures to ensure participants' anonymity and informed consent. We provided the participants with an information consent form that detailed the study objectives, activities, benefits, and risks, along with the voluntary nature of their participation. Before the actual survey, we offered the participants a checkbox option to electronically confirm their consent.

To protect the subjects, the data collection did not include student names or student identification numbers. All the data was collected through an online questionnaire, which was administered through a secure webpage with an encrypted data connection. Furthermore, the database stored all collected material in password-restricted files, limiting access to only the project's members. We have taken care to adhere to the principle of beneficence, minimizing risks and maximizing the study's benefits. The university also provided participants with contact details for counselling services at the end of the questionnaire.

3.5 Data Analysis Techniques

We conducted data analysis for this study using regression analysis in SPSS (Statistical Package for the Social Sciences) to examine the relationships among variables such as student engagement, career adaptability, transferable skills, social support, and employability outcomes. We first screened the dataset for missing values, outliers, and inconsistencies. We handled missing data using mean substitution or imputation techniques, and addressed outliers based on z-scores. We calculated descriptive statistics such as means, standard deviations, and frequency distributions to summarize the demographic data and study variables. We assessed the internal consistency of the survey instruments using Cronbach's alpha, with values above 0.70 indicating acceptable reliability. Exploratory factor analysis (EFA) confirmed the construct validity. We employed multiple regression analysis to test the research hypotheses, assessing the impact of student engagement and career adaptability on employability outcomes.

We included control variables like age, gender, academic discipline, and university type to ensure the accuracy of the models. We tested and met the assumptions of regression analysis, which include linearity, independence of errors, homoscedasticity, normality, and multicollinearity. We evaluated the regression models using R-squared and adjusted R-squared to determine the proportion of variance in employability outcomes that the independent variables explained. The F-test confirmed the overall significance of the models, while the coefficients shed light on the direction and strength of relationships among the variables.

4. RESULT AND DISCUSSION

Table 2 shows that the study sample consisted of 450 participants, with a fairly balanced gender distribution (49.33% male and 50.67% female). The majority of participants were under 30 years of age (80.89%), and most were undergraduate students (75.56%). Additionally, a significant portion of the sample were domestic students (75.11%).

Table 2. Demographic Characteristics of the Study Sample (N=450)

Demographic Variable	Institution 1 (N=310)	Institution 2 (N=140)	Total (N=450)	Percentage
Gender				
Male	180	42	222	49.33
Female	130	98	228	50.67
Age				
< 30 years	248	116	364	80.89
≥ 30 years	62	24	86	19.11
Student Status				
Undergraduate	250	90	340	75.56
Postgraduate	60	50	110	24.44
Nationality				
Domestic	233	105	338	75.11
International	77	35	112	24.89
Academic Discipline				
Social Sciences	145	65	210	46.67
Other Disciplines	165	75	240	53.33

Figure 2 illustrates the demographic characteristics of the study sample, displaying the distribution of participants by gender and age across the total sample of two institutions. The figure shows the number of male and female students, as well as the age groups under 30 years and 30 years or older, providing a visual representation of the sample's demographic composition.

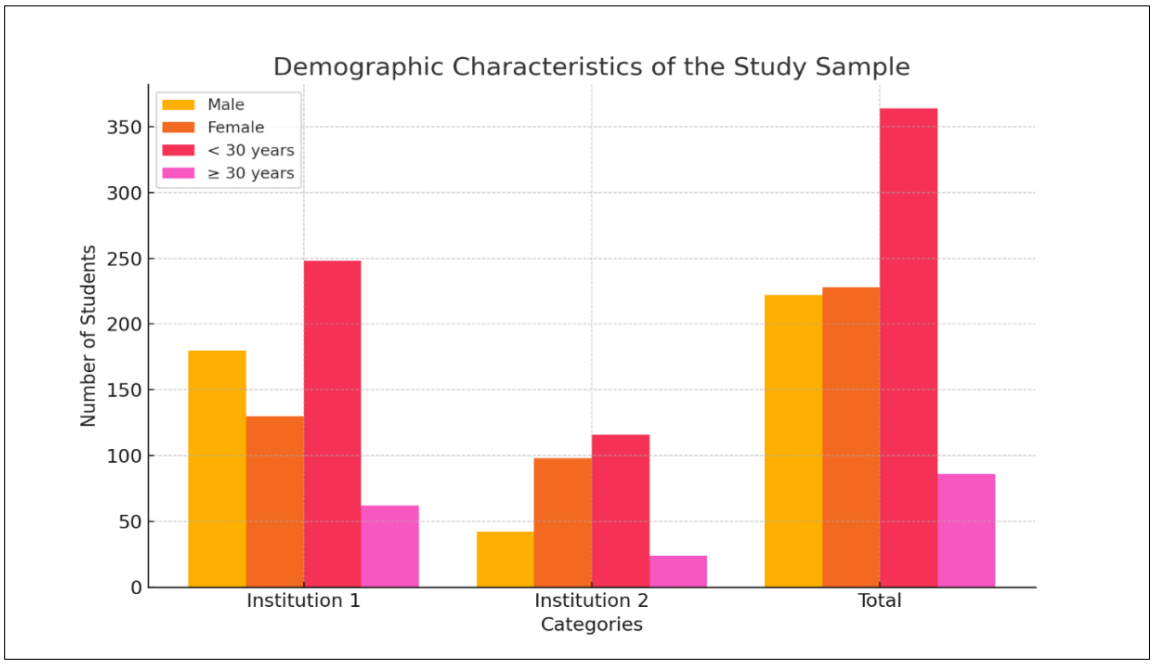

Figure 2. Demographic Characteristics of the Study Sample

Figure 3 shows the academic and nationality distribution of the study sample across the two institutions. The figure highlights the number of undergraduate and postgraduate students, as well as the distinction between domestic and international students. It is evident from the figure that Institution 1 has a higher proportion of undergraduate students and domestic participants, whereas Institution 2 has a more balanced distribution of postgraduate and international students.

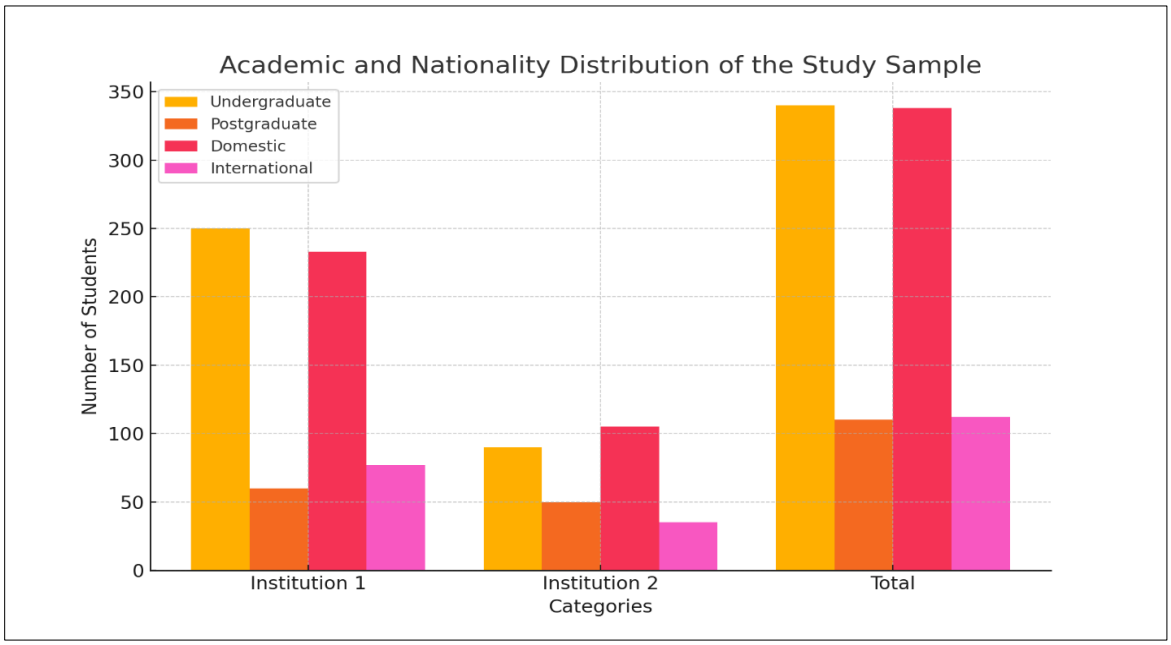

Figure 3. Academic and Nationality Distribution of the Study Sample

Table 3, below provides insight into the overall trends and variability within the study sample. The data shows that participants generally reported positive levels of career adaptability, transferable skills, social support, student engagement, and employability.

Table 3. Descriptive Statistics of Key Variables (N=450)

Variable	Mean	Standard Deviation
Career Adaptability	4.16	0.83
Transferable Skills	4.02	0.74
Social Support Networks	3.86	0.89
Student Engagement	4.17	0.8
Employability	4.1	0.85

Table 3, indicate the central tendency and variability within the sample. The mean scores for all variables range between 3.86 and 4.17 on the Likert scale, suggesting that participants generally rated themselves positively on career adaptability (Mean = 4.16, SD = 0.83), and transferable skills (Mean = 4.02, SD = 0.74). The social support networks have a mean of 3. 86, and the standard deviation was recorded to be 0. 89 with minimum and maximum values of 1. 19 to 6. 12 respectively. The data represents moderate to high level of career adaptability, transferable abilities, social support, students' activity, and prospects of employment among the participants, with some fluctuation in each aspect.

Table 4 discusses the reliability of the scales used in this study, with Cronbach's Alpha values ranging from 0.82 to 0.88 for all key variables. These values indicate good internal consistency, confirming that the instruments used to measure career adaptability, transferable skills, social support networks, student engagement, and employability are reliable and suitable for the analysis.

Table 4. Reliability Analysis (Cronbach's Alpha)

Scale	Cronbach's Alpha
Career Adaptability	0.85
Transferable Skills	0.88
Social Support Networks	0.82
Student Engagement	0.87
Employability	0.86

The Cronbach's alpha for career adaptability is 0.85, indicating high reliability. With a Cronbach's alpha of 0.88, more refined reliability levels are emerging from the transferable skills. Physiological assessment quantifies social support networks, revealing good reliability with a Cronbach's alpha of 0.82. The Cronbach's alpha score of 0.87 indicates that student engagement also exhibits reasonable internal consistency. Lastly, the employability scale exhibited a reliability score of 0.86, indicating that the scale designed to measure this variable has good reliability. All in all, these values provide evidence that the scales used in this study are tapping into the expected constructs.

Moreover, Table 5 provides the results of the exploratory factor analysis (EFA), showing strong factor loadings (ranging from 0.71 to 0.83) for each variable. The explained variance for the factors ranges from 21% to 25%, indicating that the items effectively represent their respective constructs and support the validity of the measures used in the study.

Table 5. Exploratory Factor Analysis (EFA)

Variable	Representative Items	Factor Loadings	Explanation of Variance
Career Adaptability	Items 1-12	0.73 - 0.83	25%
Transferable Skills	Items 1-33	0.71 - 0.79	22%
Social Support Networks	Items 1-40	0.75 - 0.83	24%
Student Engagement	Items 1-31	0.74 - 0.83	23%
Employability	Items 1-15	0.72 - 0.81	21%

The results of the exploratory factor analysis (EFA) reveal that the 12 items that form career adaptability have factor loads ranging from 0.73 to 0.83. A majority of transferable skills displayed 33 items, with factor loading ranging from 0.71 to 0.79. It had the second-lowest factor loading of 0.79 and accounted for 22% of the total variance on the axis. Hypothesis 1 proposed that the 40-item social support networks would display factor loadings between 0.75 and 0.83, with the study's incorporated variables accounting for 24% of this variance. The table displays the factor loadings for student engagement, which span 31 items and range from 0.74 to 0.83.

This means that it explains 23% of the variance, ranking 83rd out of all nations. Regarding the findings derived from the H-interview and validity test, the factor analysis of employability demonstrated 15 items and factor loadings ranging from 0.72 and 0.81, which account for 21% of variance. These findings suggest that the items of each variable are well-defined in their corresponding factors, and, cohesively, these factors have a significant ability to account for the variability within the data.

Figure 4 illustrates the eigenvalues for each factor extracted during the exploratory factor analysis (EFA). Each point here corresponds to a specific factor for which it holds the eigenvalue, and the factors are in diminishing order of eigenvalues. This plot serves to determine the number of factors to retain by indicating where the eigenvalues become flat to underscore the level beyond which including more factors would not add much to the variance or data explained.

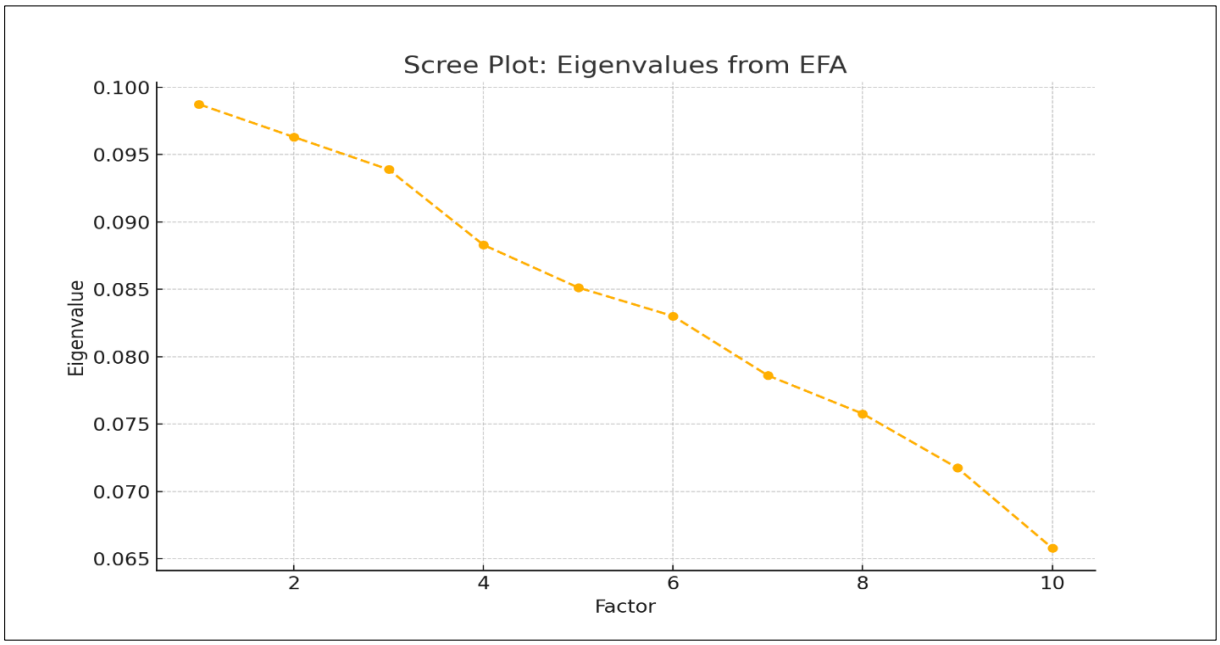

Figure 4. Scree Plot - Eigenvalues from Exploratory Factor Analysis (EFA)

Similarly, Figure 5 below demonstrates the percentage of the accumulated variance contributed by each factor derived from the Exploratory Factor Analysis (EFA). Every single bar corresponds to the explained variance for particular factor in concern. It will identify the proportionate contribution of each concerned factor towards total variance occurred in the respective data set. It can be used to gain insight as to the importance of each factor and to determine how many factors should be retained by assessing their explanatory properties.

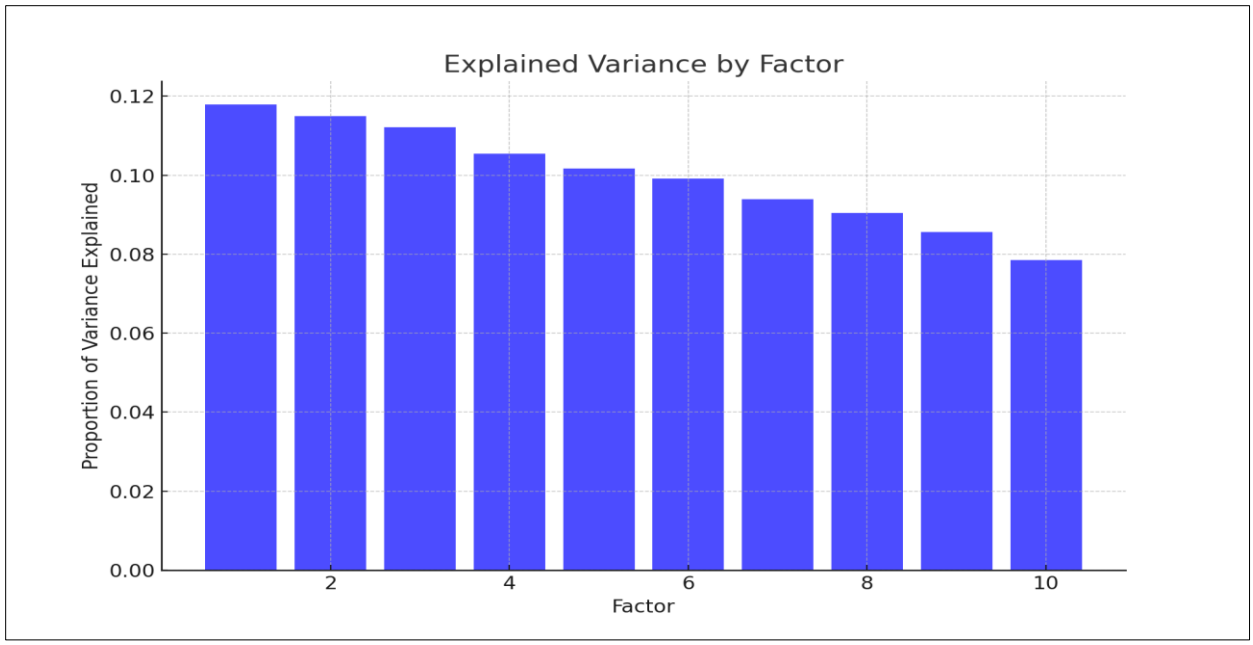

Figure 5. Explained Variance by Factor

Table 6 presents the results of the regression analysis, which supports all the study's hypotheses with significant p-values ($p < 0.001$). The analysis shows that student engagement, transferable skills, and social support positively influence career adaptability, while career adaptability, academic performance, career readiness, and job search strategies significantly impact employability. The model explains 68% of the variance in employability outcomes, as indicated by the R-squared value. It can be observed that table 6 discusses the regression analysis results which support the hypotheses by demonstrating significant relationships between the variables. The model explains 68% of the variability in Employability ($R^2 = 0.68$), with an adjusted R^2 of 0.67 and an F-statistic of 90.53 ($p < 0.001$), indicating a good fit for the data.

Table 6: Regression Analysis

Hypothesis	Dependent Variable	Independent Variable	Coefficient	Standard Error	t-value	p-value	Confidence Interval (95%)
H1	Career Adaptability	Student Engagement	0.4	0.07	5.71	<0.001	[0.26, 0.54]
H2	Career Adaptability	Transferable Skills	0.35	0.06	5.83	<0.001	[0.23, 0.47]
H3	Career Adaptability	Social Support	0.28	0.05	5.6	<0.001	[0.18, 0.38]
H4	Employability	Career Adaptability	0.45	0.08	5.62	<0.001	[0.29, 0.61]
	Employability	Academic Performance	0.25	0.07	3.57	<0.001	[0.11, 0.39]
	Employability	Career Readiness	0.3	0.06	5	<0.001	[0.18, 0.42]
	Employability	Job Search Strategies	0.33	0.07	4.71	<0.001	[0.19, 0.47]
R^2			0.68				
Adjusted R^2			0.67				
F-statistic			90.53			<0.001	

4.3 Assumption Testing for Regression Models

Ensuring the underlying assumptions of the regression models, as presented in Table 6, is crucial for ensuring the validity and reliability of the results. We conducted several graphical analyses to this end. We used scatterplots to evaluate the linearity of the relationships between the independent and dependent variables, confirming that a straight line can accurately represent these relationships. We examined the residual plot to verify homoscedasticity, ensuring that the variance of the residuals remains constant across different levels of the independent variables, a crucial aspect for unbiased and consistent model predictions. We also analyzed the histogram of residuals and the Q-Q plot to evaluate the residuals' normality. Both plots indicated that the residuals are approximately normally distributed, supporting the assumption of normality, which is vital for valid hypothesis testing and confidence interval estimation. Together, these graphical analyses provide a robust validation of the regression models, addressing key assumptions that underpin the accuracy and reliability of the study's findings.

4.3.1 Scatterplots

Figure 6 illustrates the scatterplot which shows the relationship between student engagement and employability outcomes. Each point represents an individual student's level of engagement and their corresponding employability outcome. The scatterplot helps visualize the linear relationship between these two variables, supporting the assumption of linearity for regression analysis.

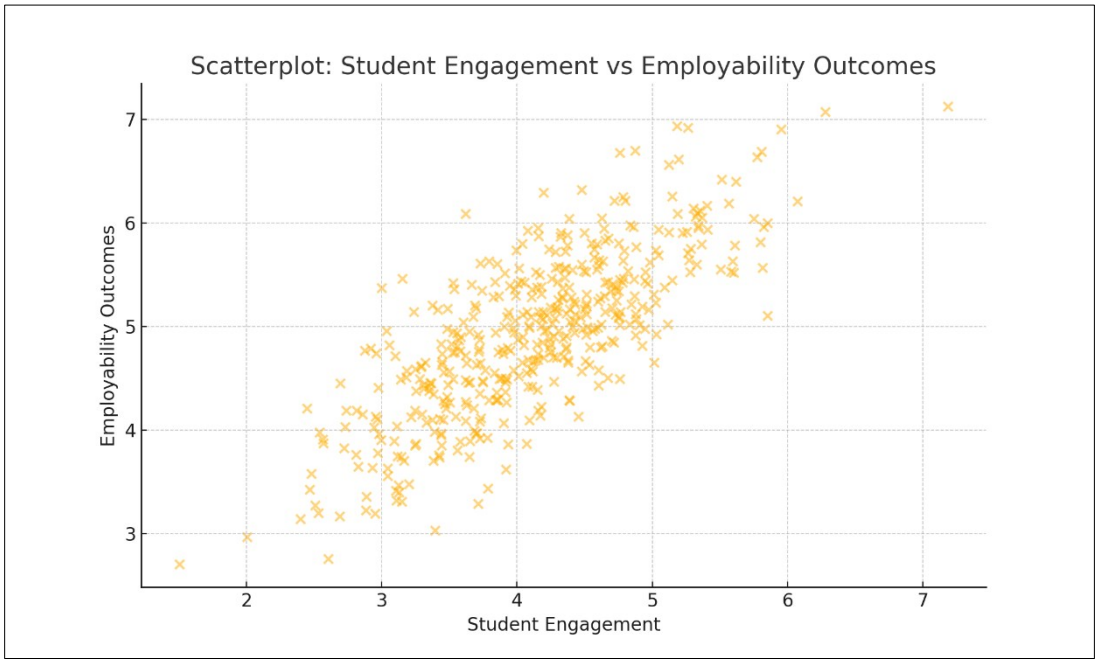

Figure 6. Scatterplot: Student Engagement vs Employability Outcomes

Figure 7 shows a scatterplot depicting the relationship between career adaptability and employability outcomes. The positive trend observed in the scatterplot indicates that higher levels of career adaptability are associated with better employability outcomes, reinforcing the findings from the regression analysis.

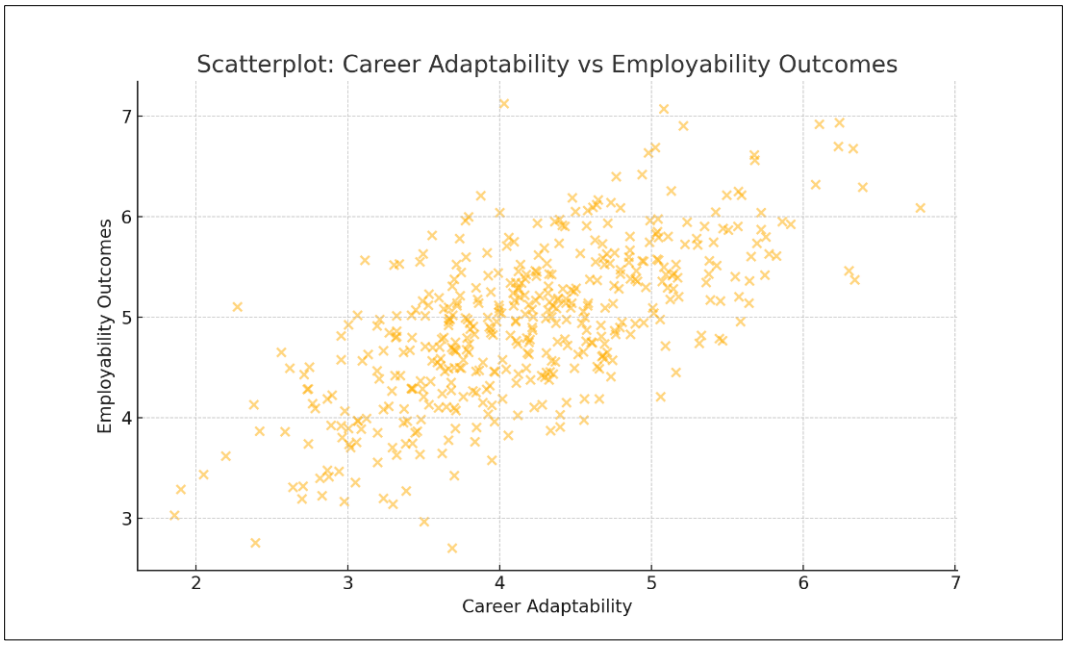

Figure 7. Scatterplot: Career Adaptability Vs Employability Outcomes

4.3.2 Residual Plot

The residual plot allows evaluation of the deviations from the expected pattern, bearing in mind that the values plotted in it are deviations from the regression line utilized in this study. This plot is employed to assess the assumption of homoscedasticity of the regression analysis, which is essential to guarantee the accuracy of our findings concerning student engagement, career adaptability, and possibilities to achieve employment. In figure 8, the test for homoscedasticity of the regression model is depicted by the residual plot. The scattering of the residuals randomly around the horizontal axis implies that the assumption of homoscedasticity is fulfilled meaning that the level of variance is constant at any level of the fitted values. This enhances the reliability and accuracy of the regression analysis that has been done in this study.

4.3.3 Histogram of Residuals

Histogram of residuals is used to determine adherence to normality in the context of the regression analysis. It is to be noted that a bell-shaped histogram indicates normality of the residuals, which is one of the assumptions of valid regression analysis. Checking the normality of the residuals guarantees that the model for the prediction of employability outcomes using the components of student engagement and career adaptability is accurate and free from systematic bias. Figure 9 below shows the histogram of residuals applied to test for normality assumption of the regression model. The residuals are said to be normally distributed and hence the normality assumption is reasonably met as reinforced by the figures above as well. This makes the findings of the regression analysis credible and affirms the accuracy of the results that has been obtained from the model.

Figure 8. Residual Plot: Checking Homoscedasticity in Regression Model

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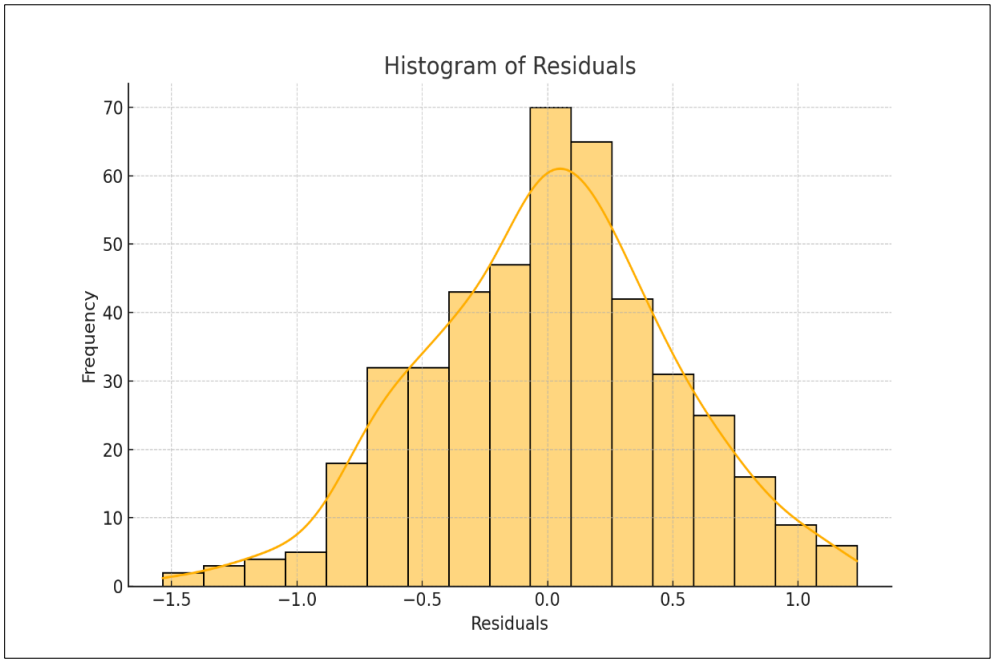

Figure 9. Histogram of Residuals: Assessing Normality in Regression Model

4.3.4 Q-Q Plot of Residuals

The Q-Q plot is used to test normality of residuals of the models, if the residuals are normally distributed, or there is homoscedasticity, then the points on the Q-Q plot should lie roughly on the reference line. Another essential precondition of the regression model is that residuals of all groups should obey a normal distribution.

It supports the conclusion that the non-normal residuals of the two groups of the predictors (student engagement and career adaptability) to the two indicators of employability outcomes does not raise a serious concern, thus, reinforce the validity of the results obtained. Figure 10 in the form of Q-Q plot of residuals is used to check the assumption of normality of residuals in the given regression model. A test for normal distribution of the residuals is therefore inconclusive though the graphs show that the residuals are almost perfectly aligned to the reference line. This also helps in asserting the normality assumption as well as going further in enhancing the results of the regression analysis.

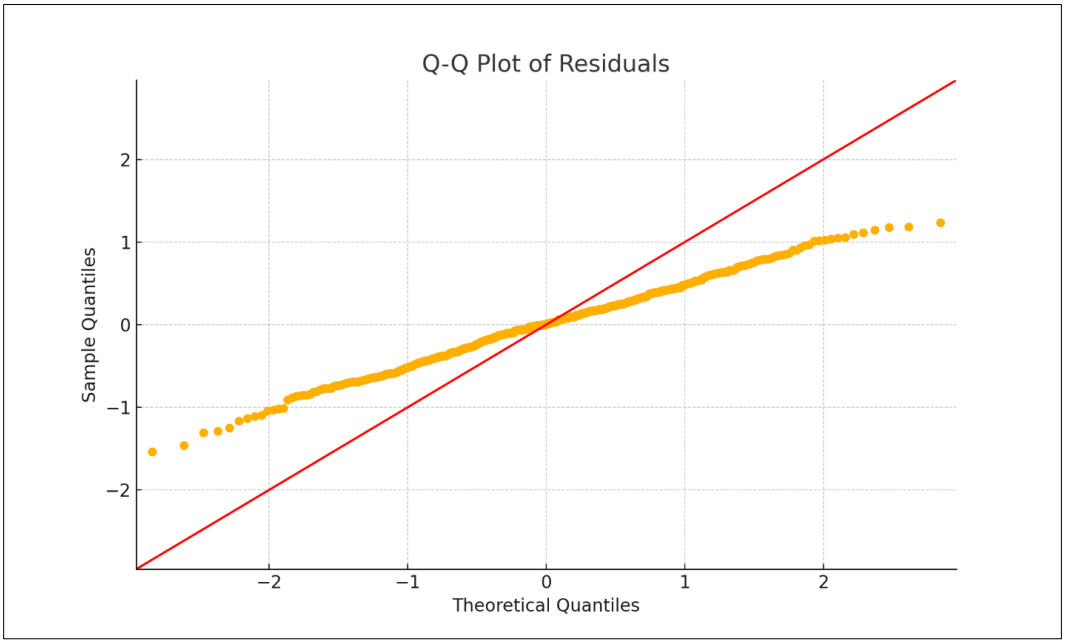

Figure 10. Q-Q Plot of Residuals: Assessing Normality in Regression Model

Table 7 presents the test results of the assumptions made in the regression models applied in this research study. The tests confirm that all key assumptions are met. Linearity is checked through the scatter plots while the coefficient of determination is checked through Durbin-Watson statistic through residual plot we check homoscedasticity, histogram and Q-Q plot to check normality of residuals and finally check for multicollinearity through VIF which is equal to 1.00 for both student engagement and career adaptability. These results ensure the reliability and validity of the regression analysis carried out.

Table 7. Assumption Testing for Regression Models

Assumption	Test	Results
Linearity	Scatterplots	Visual inspection confirms linearity (see scatterplots)
Independence of Errors	Durbin-Watson statistic	2.06 (indicates no autocorrelation)
Homoscedasticity	Residual plots	Visual inspection confirms homoscedasticity (see residual plot)
Normality of Residuals	Histogram and Q-Q plots	Visual inspection confirms normality (see histogram and Q-Q plot)

Multicollinearity	Variance Inflation Factors (VIF)	Student Engagement: 1.00, Career Adaptability: 1.00 (indicates no multicollinearity)

4.4 Discussion

The research investigated the relationship between student engagement, career adaptability, and the jobs market for university graduates. The findings indicated that the current research on these significant antecedent factors affecting graduate performance. First, the total positive correlation between career adaptability and employability outcomes backs up what other studies have found about how important it is to be able to adapt to changing labor market conditions in today's business world. According to Maggiori et al. (2017), career adaptability is a psychological resource. Furthermore, the postmodern perspective reflects an individual's ability and willingness to engage in vocational development and meet the present and future demands of the job market. Xia et al. (2021) pointed out that higher levels of career adaptability led to enhanced employment outcomes for the graduates. To be precise, the current regression analysis indicated that career adaptability was a significant determinant of successful completion of the transition to the work force. This implies that the graduates showing high levels of adaptability to complex changes are likely to succeed in their search for jobs in the market.

Moreover, this study affirms the conclusions made in other studies on how transferable skills impact employability. The soft skills, such as communication, teamwork, and problem solving, hold significant importance in the workplace due to their transferability and increased demand (Jackson & Tomlinson 2020). Thus, we effectively communicated that graduates can transfer their acquired skills to a different work environment, thereby enhancing their employment prospects and job performance. The study analyzed the significance of the social support networks in the process of career-building and obtaining a job. As in many previous studies, our research shows that social support is positively associated with employability. Family and friends, as well as university support in terms of resources, information, and encouragement, are vital in achieving the graduates' goal (Chen et al., 2020).

The data showed that students who received high levels of support from their mentors, peers, and family members were more likely to secure more favorable employment outcomes. Khoso et al. (2022) emphasized the importance of social networks in career self-management processes, whose major tasks, as noted above, include the acquisition of opportunities as well as career protection and promotion. Finally, the study revealed that prominent aspects such as the degree of engagement have a robust influence on the employment prospects of students. Highly engaged students perform better academically and demonstrate better recruitment strategies, according to their career preparedness, recruitment processes, and employer perceptions of their employability. Students' involvement in learning activities develops the attitude, skill, experience, and capacity that prepares them for the job market. Additionally, these findings have significant theoretical implications. These relations underpin different legal systems, which influence the selection of contractual partners and performance evaluation criteria in the capital accumulation relations.

5. PRACTICAL IMPLICATIONS

The implications of this study are very clear and specific for universities, policymakers, and employers who want to promote graduate employment. Firstly, regarding career learning, universities should aim at the institutionalization of special modules that would enhance such competencies as flexibility, patience,

endurance, and the ability to find a suitable job. Simulation-based learning closely mimics the contemporary job market scenario, aiding in the sharpening of pertinent skills before students transition into the job market. The study also emphasizes the transferable skills. Universities should therefore deliberately introduce and integrate subject crossings as well as realistic learnings that prepare students for diverse openings in different sectors to enhance their employer uptake in the fiercely competitive employment landscape. The outcome also underscored the significance of establishing robust social support networks within the university environment. The use of planned teacher or tutor systems and peer support groups will enable students to receive timely professional direction, fellowship, and counselling. Particular consideration should be given to the growth of international students and the provision of support for specific circumstances.

6. CONCLUSION & RECOMMENDATIONS

The study's findings concluded that university graduates' employment prospects are highly associated with career adaptability, transferable skills, sources of social support, and student engagement. Career adaptability has the greatest impact on employability, implying that higher education institutions should incorporate adaptability training in order to prepare learners to fit in the current dynamic market. We also established that interdisciplinary and practical teaching methods are crucial for acquiring transferable skills, as these soft skills aid in integrating into the job industry. The analysis of the findings also revealed that social support, both within and outside the university, plays a crucial role in career acquisition. Therefore, we recommend the implementation of mentorship and professional development programs. Furthermore, the study found that active student participation had an impact on employability, implying that universities should encourage students to participate in learning activities as well as other co-curricular activities. The study has implications for universities in terms of graduates' employability skills, as well as for policymakers in terms of designing and implementing educational initiatives and policies to improve graduates' workforce preparedness.

6.1 Limitations and Future Research

Some limitations of the study include the selection of the sample from only two universities in Guangzhou, which may limit the generalizability of the results to other higher education institutions in China or other countries. Further studies should try to use a wider participation of universities from different areas to increase the external validity of the outcomes. Furthermore, this study employs a cross-sectional method that only takes information at a specific time and does not demonstrate variation in terms of employability as graduates enter the workplace. The change in these variables is best captured in longitudinal studies, thus widely recommended as a way of establishing the nature of relationships between career adaptability, engagement, social support, and employability outcomes.

Secondly, the use of self-reported data means that there is a possibility of response bias from respondents, which could exaggerate or underestimate their levels of career adaptability, engagement, and perceived social support. Therefore, it is critical to include objective data for comparison in future research, such as an employer's evaluation of an employee or independent testing. However, this research did not delve into nuanced aspects such as digital literacy and technological competencies, despite their increasing importance in today's global employment landscape. Simultaneously, this study provided valuable insights into positive constructs such as career adaptability, transferable skills, and social supports.

Therefore, more research is required to establish the connection between these competencies and employability, and to gain a deeper understanding of their application in the context of current organizational digitization. There is also a dearth of studies evaluating the best practices and policies that universities and policymakers can implement to enhance employability, providing guidance that will directly assist graduates entering the job market.

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Ethical Statement: The author(s) has obtained permission from the Institutional Review Boards (IRBs) of the two universities in Guangzhou. The researcher explained the study's objectives before collecting the questionnaire data. The respondents were assured that the information would only be used for research purposes. They were also told they could withdraw from the interview at any stage if they felt uneasy or did not want to continue. (See Section 3.4)
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