AN INVESTIGATION TO EVALUATE THE INFLUENCE OF EXTRACURRICULAR ACTIVITIES ON THE PERSONAL AND PROFESSIONAL DEVELOPMENT OF COLLEGE-LEVEL ENGINEERS: AN EXAMINATION OF ENGINEERING STUDENTS AT PRIVATE INSTITUTIONS IN CHINA

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ABSTRACT

Using a Chinese-language and culturally adapted version of the Postsecondary Student Engagement Survey (PosSES 2.1), this research set out to examine how engineering students at a single private Chinese institution felt about open access (OA). In this post, we provide the findings of a survey that asked 283 senior engineering students about their experiences with the project and their opinions on its advantages and disadvantages. The evidence suggests that participation at all levels may have a substantial positive effect. There are large differences in the quantity, nature, and level of active involvement among engineering students, which in turn causes a wide range of emotional engagement. The amount of OA that students engaged in had little effect on their emotional participation, in contrast to the quantity of negative outcomes. Furthermore, a strong correlation was found between emotional involvement and positive outcomes. These findings suggest that members of the engineering community, including students, educators, and policymakers, should value high-quality OA connections more than quantity. Descriptive statistics based on participants' perceptions of what motivates or discourages engagement outside of class are also provided by the study. The majority of the existing literature in China focuses on students' knowledge gains and their active engagement. This study shows that open access participation is a practical way for engineering college students in China to develop, and it also shows that student engagement metrics in engineering education depend substantially on emotional involvement.

Keywords: *Extracurricular Engagement, Personal Development, Professional Progression, Engineering Education.*

1.INTRODUCTION

Universities are under pressure to increase students' employability due to rising enrollment and a greater focus on the monetary worth of a degree. Teachers have a responsibility to assist their pupils in becoming ready for the exponential growth of information and communication

technologies and globalization. Making pupils more marketable to potential employers is another hot topic. The fact that graduates' ability to find job has a direct influence on higher education policy and practice is directly related to the seeming expansion of programs focused on improving students' employability. Achieving short-term objectives connected to getting a job, improving professional preparation, and supporting ongoing learning are all part of the strategy's emphasis on employability, which might affect the activities performed. There is a general consensus that participating in extracurricular activities (ECA) helps students develop marketable skills that will improve their employability after they graduate. Graduates who were involved in extracurricular activities at their schools were more highly regarded by employers. Alternatively, ECA provides students with invaluable opportunities to enhance their employability. Until 2012, there was no consensus on what ECA meant. Not only that, but ECA is totally elective and not mandatory in any way for students. Students may experiment with many kinds of social innovation and entrepreneurship on college campuses, thanks to the plethora of student groups. While there are a few schools that do provide ECA programs, the ones that do tend to be dishonest and lacking in commitment from their members. Students seldom get an opportunity to assist in planning or supervising these events because they focus so intently on their teacher. One of the main goals of the ECA is to increase enrollment in the foundation program. With its well-structured approach, emphasis on student interaction, and continuous emphasis on self-directed, holistic learning, the curriculum sets students up for future success. We can all see why a lot of kids think becoming involved in extracurriculars is a good idea. Graduates' social standing in the job market is affected by several factors, one of which is the college they attended. The kind of job that many recent graduates envision for themselves is often quite clear to them. The importance of students,

professional organizations, and educational institutions in social entrepreneurship programs is well-established (Simmons et al., 2019).

2. BACKGROUND OF THE STUDY

It is becoming more and more apparent that college students' involvement in extracurricular activities has a significant impact on their personal and professional success in the future. Academically demanding fields, such as engineering, may provide the clearest examples of this. Academic success is important, but research shows that extracurricular activities have a much more significant effect on students' development as people. The "soft skills" necessary for success in engineering include the ability to lead, communicate effectively, work in a team, solve problems, and manage one's time effectively. Students are actively involved in a wide variety of extracurricular activities, including internships, sports, cultural events, volunteer work, and professional clubs (Wang, 2019). Students who take part in these activities are able to build their resumes, put what they've learned in class to use, and connect with other professionals in the industry. Despite the clear benefits, there is a dearth of study on how these events impact the personal and professional development of engineering students, particularly in the context of private Chinese colleges. Understanding how extracurricular activities affect students' academic and personal development is vital as private institutions in China further accelerate their expansion. Private university engineering majors may face distinct challenges than their public university counterparts, such as less funding, more intense competition, and a more congested employment market. Students in this environment may be able to enhance their employability, get valuable work experience, and stand out from the crowd by becoming involved in extracurricular activities. The fundamental objective of this study is to investigate how private Chinese engineering schools'

extracurricular activities affect their students' development as individuals and as future engineers. Engineering students' educational experiences are the focus of this study, which aims to shed light on the most popular extracurricular activities, the skills they transmit, and the ways these activities effect students' personal development and professional preparation. Research like this might show how important extracurricular activities are for engineering programs at private Chinese institutions, which could influence policy and student engagement efforts. Although there is a widespread agreement that extracurricular activities may have a good effect on students' personal and professional development, research on engineering majors at private Chinese colleges is lacking (van Hooft et al., 2020). There is a dearth of data on the effects of extracurricular activities on kids' long-term academic achievement, as many Chinese private schools target younger children. In order to improve their academic programs and student support services, private schools that want to provide affordable, career-oriented education must study the effects of extracurricular activities on students' overall development. Many Chinese students attend private universities instead of the most prominent state schools due to budgetary constraints. Participation in extracurricular activities may help engineering students at these institutions grow as individuals by exposing them to new people, giving them opportunities to learn, and fostering friendships. In today's employment market, these traits are highly prized. Given the rapid technology advancements in China and the increasing influence of globalization, it is more important than ever to have a workforce that is adaptable, communicative, and collaborative. Extracurricular activities have many positive effects on children's mental and social health, including making them feel less alone, less stressed, and more resilient. Participation in these activities encourages students to think critically, which helps them acquire employable skills. Students get valuable

experience working in a variety of teams via their internships, clubs, and voluntary activities. In our more globalized world, the ability to comprehend and empathize with people of different cultural backgrounds is a highly sought-after quality. If students are exposed to different ideas and experiences, they may be able to develop these attributes (Liu et al., 2023).

3. PURPOSE OF THE RESEARCH

Looking at how engineering students' involvement in extracurricular activities at private Chinese universities relates to their professional and personal development in the future is the main goal of this research. Like any other career path, engineering requires a unique blend of technical know-how and people's abilities. Motivating this study is the need to understand how pupils might enhance their talents via extracurricular activities. The goal of this research is to find out how different kinds of student engagement in extracurricular activities affect students' development as individuals and as workers. Sports, clubs, internships, and membership in professional groups are all examples of what may fall under this category. The research will also evaluate many aspects of personal development, such as teamwork, communication, leadership, time management, and problem-solving abilities. Students' future employability, career preparedness, and general job readiness will be examined in connection to their extracurricular activities. fromin doing this study is to find out how students might improve their engineering education and differentiate themselves from their classmates via extracurricular activities. Having a diverse and knowledgeable team is vital in today's global market due to the growing competition for employment. There is a need in the literature, and this research intends to fill it by investigating an understudied topic: engineering students at private Chinese institutions. The study's overarching goals are to provide insight on the

unique opportunities and challenges faced by engineering students, shape institutional policies, and facilitate the incorporation of extracurricular activities into engineering students' coursework. This research seeks to have a positive impact on the future of engineering education in China by highlighting the importance of extracurricular activities in fostering personal and professional growth.

4. LITERATURE REVIEW

Research on the effects of extracurricular activities on students' academic and professional development has been few, but, a number of studies have focused on engineering students in particular, particularly in the context of private Chinese institutions. This literature review synthesises recent studies on the positive effects of extracurricular activities on student development, with a focus on important areas such as leadership development, skill improvement, job readiness, and the overall influence on students' academic and professional opportunities. A substantial amount of research has shown that students' personal development may be enhanced via participation in extracurricular activities. Leadership, social awareness, and emotional intelligence are just a few of the life skills that kids may pick up by taking part in these events (Ledyandini et al., 2020). Encouraging students to participate in extracurricular activities has a positive impact on their mental health, self-esteem, and confidence. Engineering students value academic achievement, but they also know that participating in extracurricular activities helps develop "soft skills," such the ability to work well with others, face and conquer obstacles, and cope with stress. Participation in extracurricular activities helps students improve their time

management skills since they learn to balance several commitments. These outings do double duty as stress relievers and community builders, benefiting the kids' mental and emotional well-being. Chinese private college students may benefit greatly from these elements, which provide emotional support and reduce feelings of loneliness, given the severe competition they face. Students at private Chinese universities may make a name for themselves in the engineering field by participating in internships, student-run initiatives, and professional engineering groups. College grads from private schools could find it harder to compete with their public university counterparts for employment due to a lack of professional networks and resources. Skills like problem-solving, adaptability, and empathy for others who face obstacles in their chosen profession may be honed via involvement in extracurricular activities. To help students stand out in China's competitive job market, private engineering schools provide them with leadership opportunities outside of the classroom. There is a constant need for highly skilled executives and engineers in engineering groups. Students may gain employable skills via leadership positions in extracurricular activities, such as student groups or volunteer work. The present study emphasizes the value of extracurricular activities in assisting students' personal and professional development, particularly in the engineering profession. Participation in extracurricular activities increases the likelihood that students will develop qualities that are highly valued by employers, such as leadership, teamwork, critical thinking, and interpersonal skills. To determine the exact impact on engineering students attending private Chinese colleges, further research is required. This study aims to fill that information vacuum by investigating how these students' involvement in extracurricular activities influences their professional and personal development, which in turn prepares them for success in today's workplace (Priyadarshini et al., 2018).

5. RESEARCH QUESTION

- What is the impact of Business growth on personal and professional growth of college-level engineers?

6. RESEARCH METHODOLOGY

Quantitative research refers to studies that examine numerical readings of variables using one or more statistical models. The social environment may be better understood via quantitative research. Quantitative approaches are often used by academics to study problems that impact individuals. Objective data presented in a graphical format is a byproduct of quantitative research. Numbers are crucial to quantitative research and must be collected and analyzed in a systematic way. Averages, predictions, correlations, and extrapolating findings to larger groups are all possible with their help.

6.1 Research design: In order to analyse quantitative data, SPSS version 25 was used. When analysing the statistical association, the odds ratio and 95% confidence interval were used to determine its direction and size. A statistically significant threshold was suggested by the researchers at $p < 0.05$. The primary features of the data were identified by a descriptive analysis. Mathematical, numerical, or statistical evaluations using quantitative methodologies are often used for data gathered from surveys, polls, and questionnaires, or by modifying existing statistical data using computing tools.

6.2 Sampling: Research participants filled out questionnaires to provide information for the research. Using the Rao-soft program, researchers determined that there were 1574 people in the

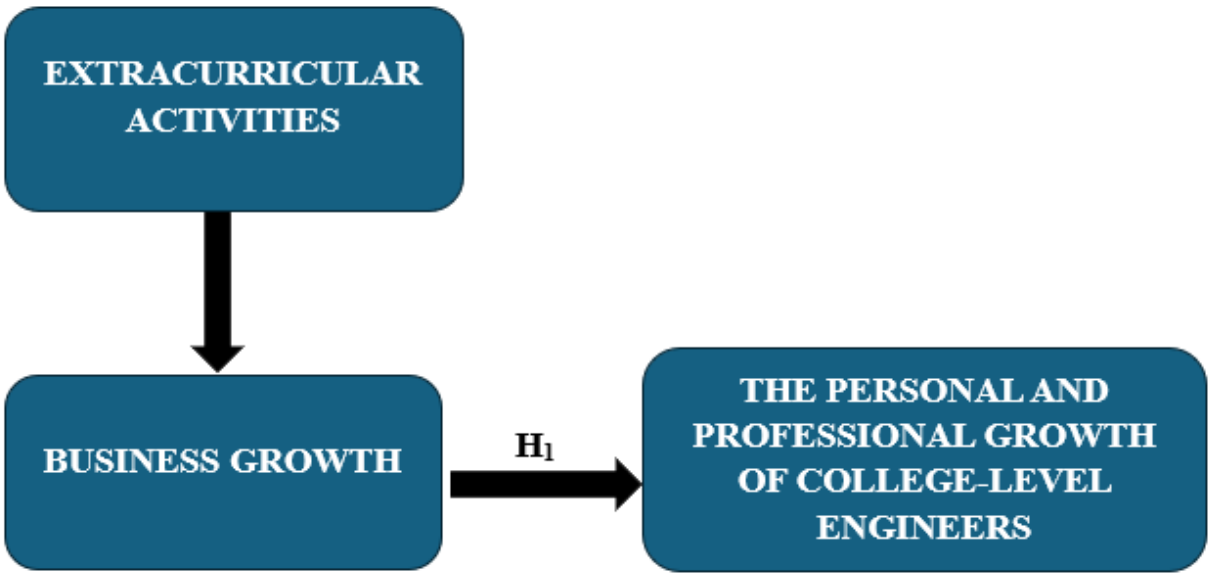
research population, so researchers sent out 1650 questionnaires. The researchers got 1628 back, and researcher excluded 16 due to incompleteness, so researchers ended up with a sample size of 1612.

6.3 Data and Measurement: A questionnaire survey functioned as the primary data collection instrument for the investigation. The survey had two sections: (A) General demographic information and (B) Responses on online and non-online channel factors on a 5-point Likert scale. Secondary data was obtained from many sources, mostly on internet databases.

6.4 Statistical software: The statistical analysis was conducted using SPSS 25 and MS-Excel.

6.5 Statistical Tools: To grasp the fundamental character of the data, descriptive analysis was used. The researcher is required to analyse the data using ANOVA.

7. CONCEPTUAL FRAMEWORK



8. RESULT

❖ Factor analysis

One typical use of Factor Analysis (FA) is to verify the existence of latent components in observable data. When there are not easily observable visual or diagnostic markers, it is common practice to utilize regression coefficients to produce ratings. In FA, models are essential for success. Finding mistakes, intrusions, and obvious connections are the aims of modelling. One way to assess datasets produced by multiple regression studies is with the use of the Kaiser-Meyer-Olkin (KMO) Test. They verify that the model and sample variables are representative. According to the numbers, there is data duplication. When the proportions are less, the data is easier to understand. For KMO, the output is a number between zero and one. If the KMO value is between 0.8 and 1, then the sample size should be enough. These are the permissible boundaries, according to Kaiser: The following are the acceptance criteria set by Kaiser:

A dismal 0.050 to 0.059, subpar 0.60 to 0.69

Middle grades often range from 0.70 to 0.79.

Exhibiting a quality point score between 0.80 and 0.89.

They are astonished by the range of 0.90 to 1.00.

Table 1: KMO and Bartlett's Test for Sampling Adequacy Kaiser-Meyer-Olkin measurement: .869

The outcomes of Bartlett's test of sphericity are as follows: Approximately chi-square degrees of freedom = 190 significance = 0.000

This confirms the legitimacy of claims made just for sampling purposes. Researchers used Bartlett's Test of Sphericity to ascertain the significance of the correlation matrices. A Kaiser-Meyer-Olkin value of 0.869 indicates that the sample is sufficient. The p-value is 0.00 according to Bartlett's sphericity test. A positive outcome from Bartlett's sphericity test indicates that the correlation matrix is not an identity matrix.

Table: KMO and Bartlett's

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.869
Bartlett's Test of Sphericity	**Approx. Chi-Square**	3252.968
	df	190
	Sig.	.000

The overall importance of the correlation matrices was also validated by Bartlett's Test of Sphericity. The Kaiser-Meyer-Olkin sampling adequacy is 0.869. Utilizing Bartlett's sphericity

test, researchers obtained a p-value of 0.00. A notable result from Bartlett's sphericity test indicated that the correlation matrix is not valid.

- **INDEPENDENT VARIABLE**
  - **Extracurricular Activities**

Extracurricular activities are those that students participate in outside of school time that are not directly connected to their academic performance. Attendees will have the opportunity to network with like-minded individuals, develop their current skills, and learn about exciting new fields of interest—all of which will boost their personal, social, and professional development. Activities such as leadership programs, clubs, sports, the arts, music, theater, debate, and volunteer work are prime examples. Involvement in extracurricular activities helps kids acquire valuable life skills such as creativity, teamwork, and time management, which are essential components of a balanced education (Leung et al., 2022).

- **FACTOR**
  - **Business Growth**

The term "business growth" describes the gradual increase in a company's size, income, market share, or impact because of better performance. Growing a business means reaching more people, selling more, and making more money. There are a number of ways for a business to expand, including penetrating new markets, introducing innovative goods or services, enhancing operational efficiency, or even merging with another company. It represents success, competitiveness, and the capacity to adjust to changing market circumstances, making it an important objective for most companies (Xiuyun, 2020).

❖ DEPENDENT VARIABLE

➢ The Personal and Professional Growth of College-Level Engineers

"Personal and Professional Growth of College-Level Engineers" encompasses the holistic development of engineering majors as individuals and from personal growth to complete job readiness. A person's capacity for self-improvement includes enhancing their capacities for critical thinking, communication, teamwork, leadership, and adaptability. Building traits like self-awareness, emotional intelligence, and a strong work ethic is essential for success on an individual level as well as in a team. Technical competency, industry knowledge, and practical experience are the three cornerstones of career advancement. In light of this, it is critical to learn engineering fundamentals, do relevant internship research, and stay abreast of technological advances. Professional development includes activities like building professional networks, creating a work-specific career plan, and familiarizing yourself with the ins and outs of the business. By investing in themselves and their careers, undergraduate engineers have a fantastic chance of becoming leaders in their fields and improving people's lives and the world at large (Hummel et al., 2018).

❖ Relationship between Business Growth and The Personal and Professional Growth of College-Level Engineers

Because engineers have the creativity and expertise to propel companies to success, particularly in tech-driven sectors, the personal and professional development of college-educated engineers is intrinsically related to the expansion of businesses overall. Students of engineering are prepared to help companies expand in a variety of ways as they gain knowledge in their field, refine their

analytical skills, and learn to solve complex problems. From a more individual perspective, engineers who have a firm grasp of business fundamentals like product development, market research, and entrepreneurship may help their employers spot areas ripe for innovation and progress. Engineers may better contribute to a company's strategic development by enhancing their understanding of business operations via internships, projects, and contacts with industry specialists. Engineers, in terms of career promotion, are often at the front of companies' growth drivers when it comes to product design, process optimization, and technology advancement. Their technological expertise allows them to create or enhance goods, which may boost a company's revenue, market share, and competitive edge. In addition, engineers who work for startups or in entrepreneurial endeavors contribute directly to the expansion of businesses by developing innovative products and services that address customer needs. Companies benefit from engineering students' development as individuals and as professionals because these students help cultivate the kind of creativity, leadership, and technical skill that are essential to a company's capacity to grow and thrive (Nghia et al., 2019).

Based on the above discussion, the researcher formulated the following hypothesis, which was to analyse the relationship between Business Growth and The Personal and Professional Growth of College-Level Engineers .

H_{01}: "There is no significant relationship between Business Growth and The Personal and Professional Growth of College-Level Engineers"

H_1: "There is a significant relationship between Business Growth and The Personal and Professional Growth of College-Level Engineers"

Table 2: H_1 ANOVA Test

ANOVA					
Sum					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	39588.620	801	5655.517	587.699	.000
Within Groups	492.770	810	5.356		
Total	40081.390	1611			

The outcome of this research is noteworthy. A p-value of.000 (below the alpha threshold) indicates that the value of F, which is 587.699, is statistically significant. This means the ***"There is a significant relationship between Business Growth and The Personal and Professional Growth of College-Level Engineers"*** is accepted and the null hypothesis is rejected.

9. CONCLUSION

According to studies that analyzed the effects of extracurricular activities on the personal and professional development of engineering students enrolled in private Chinese universities, such engagement may have far-reaching consequences. Students' technical competence, self-confidence, and participation in extracurricular activities are all significantly enhanced by these activities, according to the data. Participation in organizations, projects, and competitions helps engineering students learn crucial skills for their future jobs, such as leadership, problem solving, critical thinking, and hands-on experience. Collaborative engineering environments place a premium on interpersonal skills like effective communication and teamwork, which students may hone via these activities. Important life skills for academic and occupational success include self-awareness, time management, and resilience, all of which children may hone via involvement in

extracurricular activities. But there are several cultural and institutional challenges that the research highlights as specific to China's private institutions. Examples of this include the comparatively low priority placed on extracurricular activities in university courses and the pervasive academic pressure on students. By tackling these obstacles via awareness campaigns, personalized programs, and institutional support, the benefits of extracurricular activity may be fully realized. Since extracurricular activities help engineering students develop into well-rounded people and bridge the gap between classroom theory and practical experience, they are an essential complement to academic studies. To fully use this potential, educational institutions should prioritize creating an environment that encourages and supports students' participation in a range of extracurricular activities.

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