

ASSOCIATION BETWEEN EDUCATIONAL ACHIEVEMENT, EMPLOYABILITY SKILLS, AND EARLY CAREER SUCCESS AMONG UNIVERSITY GRADUATES: A CROSS-SECTIONAL ANALYSIS

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Abstract

Graduate employability has become a strategic priority for higher education institutions as employers increasingly seek graduates who combine strong academic achievement with practical and transferable professional skills. This study investigated the association between educational achievement, employability skills, and early career success among university graduates using a quantitative cross-sectional design. A publicly available dataset comprising 400 graduates was analyzed to evaluate the relationships between academic performance indicators (high school GPA, SAT score, and university GPA), employability attributes (internships, projects, professional certifications, networking ability, and soft skills), and career outcomes, including job offers, starting salary, career satisfaction, years to promotion, and work-life balance. Descriptive statistics, Pearson correlation analysis, and multicollinearity diagnostics were performed using Python. The findings revealed significant positive associations between educational achievement, employability competencies, and multiple indicators of early career success. Graduates demonstrating stronger academic performance and higher employability skill levels generally received more job offers, reported higher starting salaries, and experienced greater career satisfaction. However, severe multicollinearity among predictor variables indicated substantial overlap between academic and employability characteristics, highlighting the need for robust analytical approaches in future predictive modeling. Overall, the study emphasizes that integrating academic excellence with experiential learning and competency development is essential for enhancing graduate employability and supporting sustainable early career success in increasingly competitive labor markets.

Keywords: Educational achievement, Employability skills, Early career success, University graduates, Graduate employability

1. INTRODUCTION

Employability has emerged as a vital measure of quality in higher education in the knowledge-based economy of today. In today's world of rapid technological progress, globalization and changing expectations of the workplace, employers demand a wide range of professional and interpersonal skills in addition to solid academic skills. As a result, universities are increasingly being pressured to educate students to make successful transitions from the university to the job market, encouraging both educational attainment and employability skills. Employability generally refers to the sum of knowledge, skills, personal qualities and experiences that equip people to find, keep and develop a satisfying career (Small et al., 2018). With today's competitive labor market, there is growing focus on educators, policymakers, and employers on identifying factors that impact early career success.

Educational attainment is seen as a key determinant in career outcomes and has been historically used as such. Cognitive abilities, discipline, and academic preparedness are reflected in academic indicators, including high school grade point average (GPA), university GPA, and standardized test scores. Occasionally, positive correlations between academic achievement and career outcomes such as career satisfaction, job performance, and career success in the long term have been reported in the literature (Al-Asmar et al., 2021; Friedman et al., 2025). But, employers are increasingly aware that academic achievement is not the only indicator of an individual's capacity to work effectively in today's world. As a result, there has been a growing focus on the importance of other employability skills that go beyond the classroom.

Employability skills are a broad term that covers a variety of transferable skills such as communication, working in a team, leadership, adaptability, critical thinking and problem-solving. These competencies will help graduates to adapt to a changing work world and advance their careers. Research shows that, in addition to technical skills, soft skills are the consistent focus of employers when they hire graduates, as these skills improve collaboration, innovation and productivity in the workplace (Majid et al., 2019). To be better prepared for the workforce, higher education institutions have increasingly integrated experiential learning opportunities such as internships, industry projects, competency-based learning and professional certifications (Singha & Singha, 2024). It has been demonstrated that internship experiences enhance employability, digital competence, and confidence in one's professional skills, as well as facilitate a smoother transition to full-time employment (Musa et al., 2025). In addition, the technical skills and soft skills are also relevant in assessing internship performance, which explains the importance of providing internship training with a practical component (Franco-Angel et al., 2023).

It is now better recognized that success in early career development is a multidimensional phenomenon of objective and subjective factors including job offers, salary at first job, satisfaction with early career, opportunities to get ahead in the career, job level, and work-life balance. The research also indicates that those individuals who successfully show improvement in both academic performance and employability skills are likely to have improved employment prospects and career progression (Habets et al., 2020; Yi & Park, 2024). However, past research has tended to analyze these determinants in isolation and report on one outcome at a time (e.g., salary rather than a broad view of the early career success). There is a lack of empirical evidence that considers the joint effect of educational attainment and employability skills on a number of career outcomes.

Thus, the present study aims to examine the correlation between educational attainment, employability skills, and early success in their career paths among university graduates, based on the cross-sectional analytical approach. This study seeks to explore academic achievement, the internship experience, projects, professional certifications, networking skills, and soft skills as predictors of successful early career development for a variety of career pathways. The results will be reported back to higher education institutions, employers and policy makers to inform their efforts to boost the employability of graduates and make the workforce more relevant to the global job market.

Research Objectives

- 1.To examine the association between educational achievement and early career success among university graduates.
- 2.To assess the impact of employability skills on early career success.
- 3.To identify the key predictors of early career success using multivariable analysis.

2. MATERIALS AND METHODS

2.1 Study Design

The research design used in this study was quantitative with a cross-sectional research approach, which is representative of the type of study for examining the relationship between educational achievement, employability competency, and early career success among graduates from university. The cross-sectional approach allowed for multiple independent and dependent variables to be assessed from the same set of data. This type of design is suitable for the purpose of identifying statistical relationships and significant predictors of the outcomes of a study when the variables of the study are not manipulated.

2.2 Data Source and Study Variables

The analysis was done on secondary data available from public source of 400 university graduates (Shamim, 2025). The data comprised demographic data, academic performance indicators, employability characteristics and measures related to job outcomes. The variables of educational achievement were high school GPA, SAT score, and university GPA, and the variables of employability were internships, projects, certifications, networking score, and soft skills score. Job offers, starting salary, career satisfaction, years to promotion, current job level and work-life balance were used to measure early career success.

2.3 Data Pre-processing

The data was screened before statistical analysis for completeness, consistency and accuracy. Data variables were

checked for proper analysis, and missing data, duplicate records, and inconsistencies were investigated. The categorical variables were coded, and the continuous variables were checked for extreme values and shape of the distribution. To enhance the robustness and validity of the statistical models, variables were excluded from analyses if they did not have analytical variability.

2.4 Statistical Analysis

Study variables and participant characteristics were summarized using descriptive statistics. Pearson's correlation analysis was conducted to explore associations between continuous variables and multiple linear regression analyses were conducted to determine the independent relationships between education attainment and employability skills about early career success outcomes. The Variance Inflation Factor (VIF) was used for evaluating multicollinearity and 95% confidence intervals were used to determine statistical significance at $p < 0.05$. Analysis of all data was done with python.

2.5 Ethical Considerations

This research was based on an anonymous, publicly available secondary dataset that did not include personally identifiable information. No individuals were directly solicited or contacted, so informed consent and institutional ethical approval was not necessary. Ethical issues and standards of research integrity were adhered to in conducting the study, namely: Responsible and ethical use of data, Confidentiality, Transparency, and Research integrity.

3. RESULTS

3.1 Participant Characteristics

In total, 400 university graduates were analyzed. Data screening was not conducted and no missing values or duplicate records were found. There were equal numbers of male and female participants (50.0% each). The largest academic discipline was business (18.0%) followed by Engineering (14.5%) and Psychology (13.8%). With respect to employment status of graduates, the majority were at mid-level positions (65.3%), while 20.0% and 14.8% were at entry-level and senior-level positions, respectively. There was no variation in the Entrepreneurship variable regardless of whether all the participants were classified as "No", so it was not included in subsequent inferential analysis. Table 1 presents the summary of demographic and educational profiles of study samples.

Table 1. Demographic and Educational Characteristics of Participants (N = 400)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	200	50.0
	Female	200	50.0
Field of Study	Business	72	18.0
	Engineering	58	14.5
	Psychology	55	13.8
	Computer Science	49	12.3
	Law	44	11.0
	Marketing	44	11.0
	Medicine	35	8.8
	Arts	32	8.0
	Finance	5	1.3
	Education	3	0.8
	Nursing	3	0.8
Current Job Level	Entry	80	20.0
	Mid	261	65.3
	Senior	59	14.8

3.2 Descriptive Statistics of Study Variables

The academic achievement and employability profiles of the graduates were generally high as shown in descriptive statistics. The mean age of the participants was 23.00 ± 1.42 years and the average GPA at the University was 3.44 ± 0.29 . The average number of internships was 2.50, academic projects were 6.24, and professional certifications completed were 2.62. The mean amount of job offers received by the graduates was 2.74 ± 0.60 , while the mean starting salary was $\$87,562.50 \pm \$29,685.42$. Career satisfaction scores were high (7.79 ± 1.37) while the average work-life balance scores were 6.41 ± 0.93 . The following complete descriptive statistics are shown in Table 2.

Table 2. Descriptive Statistics of Educational Achievement, Employability Skills, and Career Outcomes

Variable	Mean $\pm$ SD	Minimum	Maximum
Age (years)	23.00 $\pm$ 1.42	21	25
High School GPA	3.62 $\pm$ 0.19	3.20	3.90
SAT Score	1388.60 $\pm$ 114.31	1160	1580
University GPA	3.44 $\pm$ 0.29	2.80	4.00
Internships Completed	2.50 $\pm$ 1.06	0	4
Projects Completed	6.24 $\pm$ 1.90	2	9
Certifications	2.62 $\pm$ 1.27	0	5
Soft Skills Score	7.93 $\pm$ 1.31	5	10
Networking Score	6.93 $\pm$ 1.32	4	9
Job Offers	2.74 $\pm$ 1.36	0	5
Starting Salary (\$)	87,562.50 $\pm$ 29,685.42	31,000	152,000
Career Satisfaction	7.79 $\pm$ 1.37	5	10
Years to Promotion	2.92 $\pm$ 1.34	1	5
Work–Life Balance	6.41 $\pm$ 0.93	5	9

3.3 Correlation Analysis

The Pearson correlation analysis revealed statistically significant positive correlations between educational achievement, employability skills and early career success indicators. University GPA was strongly associated with job offers ($r = 0.965$), starting salary ($r = 0.956$), and career satisfaction ($r = 0.967$) ($p < 0.001$). Likewise, the certifications showed high positive relationships with starting salary ($r = 0.968$) and job offers ($r = 0.971$). The year to promotion was negatively correlated with education and employability variables, with a high correlation suggesting that the better students and in the labor market, the faster their advancement. The overall structure of the correlations is shown in Figure 1, and some significant ones are given in Table 3.

Table 3. Selected Pearson Correlation Coefficients Between Predictor Variables and Career Outcomes

Predictor	Job Offers	Starting Salary	Career Satisfaction	Years to Promotion
High School GPA	0.966***	0.951***	0.964***	−0.961***
SAT Score	0.966***	0.952***	0.967***	−0.956***
University GPA	0.965***	0.956***	0.967***	−0.963***
Internships Completed	0.966***	0.938***	0.962***	−0.940***
Projects Completed	0.967***	0.943***	0.964***	−0.935***
Certifications	0.971***	0.968***	0.961***	−0.925***
Soft Skills Score	0.957***	0.953***	0.967***	−0.944***
Networking Score	0.957***	0.953***	0.967***	−0.944***

Note: ** $p < 0.001$.

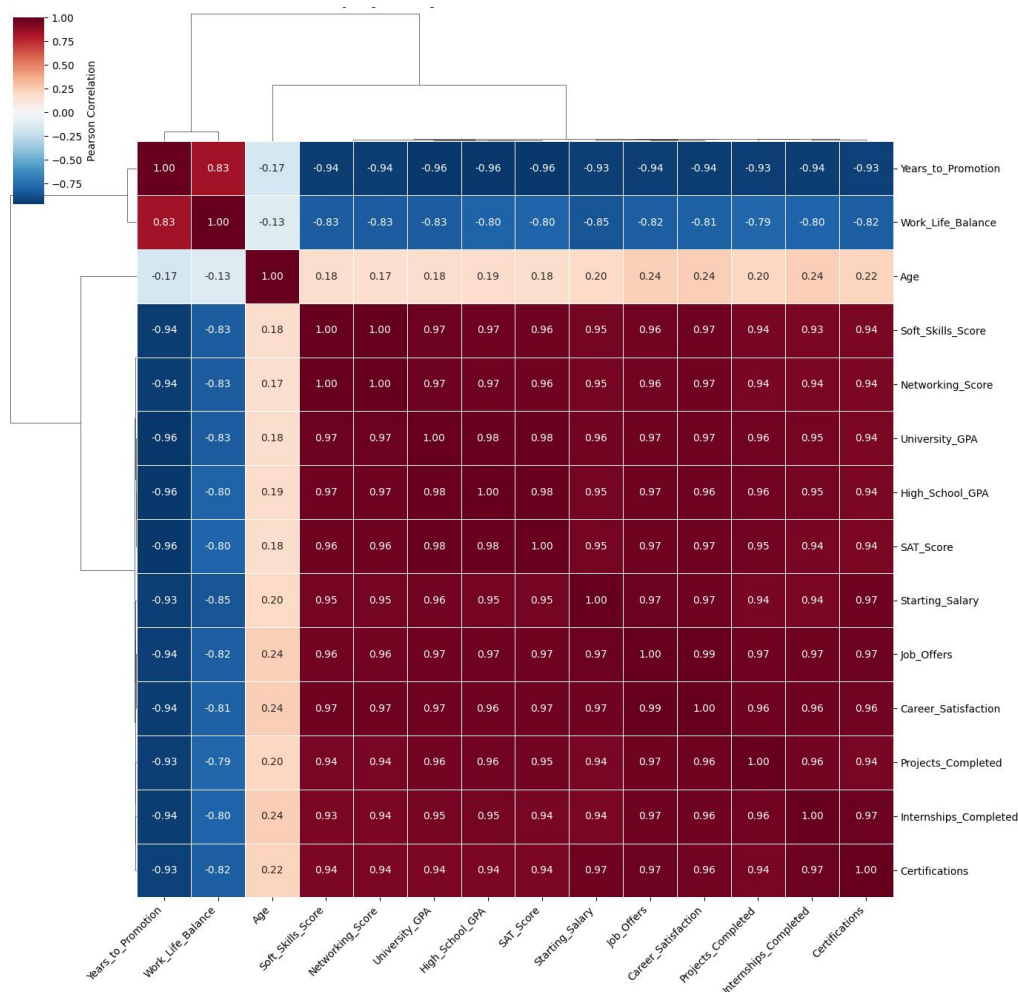


Figure 1. Correlation Matrix of Educational Achievement, Employability Skills, and Early Career Success Variables

3.4 Multicollinearity Assessment

To find out whether the use of multivariable regression is appropriate, we checked for multicollinearity by calculating the Variance Inflation Factor (VIF). As presented in Table 4, the values of all the predictor variables were far greater than 10, the value recommended by literature. The highest VIF values found were for the Soft Skills Score (13,028.97) and Networking Score (9,621.07), showing very high collinearity between the explanatory variables. The VIF values were still very high, even after the predictor set was reduced, indicating high collinearity between the variables and representing high overlapping constructs. In this context, it is suggested that the conventional ordinary least squares regression is not appropriate and the regularized regression methods are suggested for predictive modelling with this data set.

Table 4. Variance Inflation Factor (VIF) for Predictor Variables

Variable	Initial VIF	Revised VIF
Age	279.42	215.92
High School GPA	6,716.06	—
SAT Score	5,114.22	—
University GPA	6,357.97	867.68
Internships Completed	182.08	134.44
Projects Completed	210.46	—
Certifications	113.92	111.09
Soft Skills Score	13,028.97	601.08
Networking Score	9,621.07	—

4. DISCUSSION

This paper focused on the relationship between educational attainment, employability skills and early career success of university graduates. The results showed that there were strong positive links between academic achievement and

employability skills, and between academic achievement and career outcomes, suggesting that generally, students with higher scores on the academic profile and employability skills had more positive career outcomes. The results support the idea that graduate achievement is not a function of academic achievement alone, but also of acquiring applied skills that are useful for occupational success. With the rise of the dynamic labor market and the growing emphasis on preparing students for today's labor market, the integration of academic learning and employability development is increasingly important (Yi & Park, 2024; Jackson, 2024).

Educational attainment still proved to be a strong predictor of early career success. The positive correlations between high school GPA, university GPA, SAT scores and job offers, starting salary, and satisfaction with their careers indicate that strong academic work reflects a student's knowledge, discipline, and analysis skills that employers value. This is supported by the previous study conducted by Duta et al. (2021); Pico-Saltos et al. (2021) which established that education positively affects employment opportunities and career growth in the long term. High academic achievement could also suggest a student's ability to learn and adjust, which is important to performing in competitive professional settings.

The research also showed that employability skills make a significant contribution towards positive career outcomes. Indicators of career success were linked to positive participation in an internship, professional certification, project experience, networking skills, and soft skills. The results lend credibility to the emerging trend of acknowledgement from employers that they are seeking transferable skills in addition to formal educational qualifications, such as communication, teamwork, leadership, problem solving, and the like. Franco-Ángel et al. (2023) found that internship successful performance requires technical skills and interpersonal skills, and Ng et al. (2021) concluded that employability skills provide graduates with better opportunities for employment. Also, Mtawa et al. (2021) highlighted that experiential learning activities enhance graduates' capacities and make them more ready for the labour market.

Career success is a multi-dimensional phenomenon which involves not only access to jobs but also salary, satisfaction with career, promotion and wellbeing in career. Results from this study indicate that there is a positive relationship between education, employability skills and various career outcomes, and universities need to take a comprehensive view of the development of graduates. A graduate who has a good academic record along with work experience and the necessary job skills is more likely to find a good job and advance in his/her career. These results corroborate the results of Yi and Park (2024), which showed that the key competencies of university students positively affect their employment and initial salary. Additionally, Jackson (2024) shared that being involved in employability development activities in higher education education plays a large role in the success of graduates in the post-secondary world.

One of the important methodological results was that high correlations between variables of educational achievement and employability were found, which led to severe multicollinearity in the regression diagnostics. This implies that the predictor variables in the data set captured very similar aspects of graduate ability. This duality in the definition of educational indicators has also been pointed out in employability prediction studies, where different kinds of indicators overlap and require complex statistical approaches for the development of predictive models that can be reliable (Mezhoudi et al., 2023). More comprehensive data sets and more diverse data sets in the future would be better suited to consider regularized regression methods or machine learning techniques to boost predictive accuracy and overcome the multicollinearity issue.

The overall results suggest that a combination of educational attainment and employability skills are important for early career success for university graduates. HEIs need to keep encouraging and promoting internships, competency-based learning, professional certification and soft skill development to enhance employability and workforce readiness of graduates. These approaches will help to pave the way for sustainable career development for graduates in increasingly challenging job markets, in addition to improving employment rates and long-term career success.

5. CONCLUSION

A cross sectional – analytical approach was used in this study to analyze whether there is any association between educational achievement, employable skills and early career success among university graduates. The results showed that higher academic achievement, internship experience, professional certification, project involvement, networking ability, and soft skills were always linked to better career results such as more job offers, higher starting salaries, higher career satisfaction, and faster career advancement. The findings highlight the effects co-existing with academic achievement are the employability skills that are acquired during a student's academic training and preparation for college, and that early success in the workforce is the joint effect of both training and skills. The study also underscores the need for experiential learning and competency-based education in university programs to improve the readiness of the workforce and drive good outcomes for the transition to the world of work. The correlation analysis showed good relationships between the study variables, but there is significant multicollinearity between the variables, suggesting that educational achievement and employability skills are closely related dimensions of graduate capability and need to be treated with care when using the variables in predictive modeling. Despite this restriction there are important implications for higher education institutions, employers and policy makers interested in enhancing the employability of graduates through holistic approaches to education. The results of this study should be validated using longitudinal data and multi-institutional data to determine the long-term effects of academic achievement and employability competencies on sustainable career development in various workplaces.

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