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# The Economics of Higher Education Investment and Graduate Earnings: The Mediating Effect of Skill Acquisition

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## ABSTRACT

This investigation looks into how gaining skills links higher education investments to future earnings for postgraduate individuals in Saudi Arabia. Analyzing the mechanisms through which educational investments yield economic returns is imperative for synchronizing educational methodologies with labour market requirements, particularly as Saudi Arabia transitions toward a knowledge-oriented economy. This inquiry aims to delineate the determinants of graduate earnings and elucidate the manner in which skill acquisition enhances employability and the potential for increased income. For this investigation, a meticulously structured survey was administered to a cohort of 176 recent graduates from Al-Jouf, Hail, and Northern Border Universities. The survey scrutinized the influences of tuition fees, governmental subsidies, parental financial assistance, scholarships, and vocational training initiatives on the processes of skill acquisition and the resultant earnings of graduates. The research utilized Structural Equation Modeling (SEM) to explore how higher education investments correlate with skill improvement and economic achievements. The SEM framework assessed both direct and indirect effects, thereby underscoring the role of skill acquisition as a crucial mediating factor in the relationship between educational investment and earnings. A positive correlation exists between educational investments and graduate earnings, mainly when skill acquisition is considered. Programs focused on practical, technical, and soft skills have been shown to enhance employability and income levels. These findings underscore the necessity for educational reforms emphasizing skill development, aligning with the demands of the Saudi labour market by Vision 2030.

**Keywords:** Higher Education; Investment, Graduate Earnings; Skill Acquisition; Labor Market; Economic Outcomes; Vision 2030; Saudi Arabia

**Jel Classification Codes:** I22, J24, I26, O15.

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## 1. Introduction:

Saudi Arabia's realm is seeing a notable evolution, transitioning from a largely oil-centric economy to a more mixed economic approach. This metamorphosis is bolstered by the Vision 2030 initiative, which underscores the necessity of cultivating a knowledge-centric economy. At the heart of this initiative lies the imperative to augment higher education systems to yield graduates with competencies pertinent to the global labour market (Ryan, 2023; El-Tahan et al., 2021). Analyzing the correlation between investments in higher education and the economic advantages accrued by postgraduates is vital, particularly as the nation endeavours to leverage educational outcomes to advance its ambitious developmental objectives. The present research aspires to investigate the degree to which these investments are associated with the economic returns realized by graduates, meticulously examining the intricacies of this relationship within a swiftly transforming socioeconomic milieu.

The impetus for this investigation arises from a pressing necessity to reconcile higher education outcomes with the shifting labour market requisites of Saudi Arabia. The efficacy of educational frameworks in equipping graduates for prosperous careers is of utmost importance as the nation propels its non-oil economic sectors forward. Nevertheless, a conspicuous deficiency exists in comprehending the exact mechanisms through which investments in higher education influence graduate income within the Saudi context. The extant literature indicates a dearth of empirical evidence concerning how skill acquisition mediates the relationship between educational investments and concrete economic advantages, a gap that this study intends to address (Dhia, 2023; Almutairi, 2024; Alanazi & Benlaria, 2023).

The educational landscape of Saudi Arabia is confronted with considerable obstacles in the context of swift demographic transformations, technological innovations, and shifts in the global economy. Conventional teaching methodologies that prioritize rote memorization over the cultivation of practical and analytical thinking abilities hinder the implementation of educational curricula that effectively equip graduates with applicable skills. This incongruity presents a significant impediment to the reform of educational practices necessary to fulfil the requirements of a contemporary labour force (Al-Ani, 2023; Hocine & Sofiane, 2017).

This investigation is of paramount importance as it seeks to address these pivotal deficiencies by exploring the intricate relationships between educational investments and their implications for the economic results of Saudi graduates. It thoroughly assesses the extent to which existing educational methodologies correspond with the economic and social objectives outlined in Vision 2030, yielding insights that may inform policy decisions and educational initiatives. In practical terms, the outcomes of this research furnish actionable evidence that stakeholders in policy and educational establishments can leverage to improve the relevance and calibre of higher education, thereby ensuring its alignment with labour market requirements.

Academically, this investigation augments the prevailing corpus of scholarly literature by offering a comprehensive examination of skill acquisition's function as an intermediary within the nexus of educational investment and economic returns. It contributes significantly to the extensive discourse surrounding education economics, elucidating the advantages and drawbacks of contemporary educational strategies while proffering insights into developing a resilient and adaptable workforce that is adequately prepared for a diversified economic landscape (Alsulami, 2018).

Vocational Education and Training (VET) programs are recognized as pivotal in the prompt and efficient provision of pertinent skills, explicitly catering to individuals who may be deprived of access to conventional higher education avenues. These programs play a fundamental role in aligning educational provisions with the demands of the labour market, thus facilitating socioeconomic mobility and addressing existing skill deficiencies (Alanazi & Benlaria, 2023).

The correlation between investments in higher education and subsequent postgraduate earnings within Saudi Arabia is profoundly shaped by the efficacy of educational programs in equipping graduates with requisite competencies. As the nation endeavours to diversify its economic structure, enhancing educational systems that promote relevant skill acquisition becomes essential. In pursuing this objective, Saudi Arabia not only amplifies the employability and earning potential of its graduates but also strategically positions itself to fulfil the broader economic aspirations delineated in its Vision 2030 framework, thereby transforming the educational paradigm into a fundamental pillar of national development.

## **2 .Literature review**

The relationship between investment in higher education and postgraduate gains is multifaceted and deeply intertwined with economic factors and social implications. In particular, higher education's quality and financing significantly affect graduates' income potential (Hryhorash et al., 2023). Higher education institutions act as critical facilitators of economic growth through the development of human capital, which companies often prioritize for innovation and productivity (Bonaccorsi et al., 2024).

Graduates of well-financed programs or prestigious institutions tend to have improved professional perspectives, which leads to higher wages, as demonstrated in studies that correlate academic performance with profit potential (Rudakov & Roshchin, 2019). This trend is particularly pronounced in low and medium-income countries, where investment in higher education is crucial for socioeconomic mobility, underlining the communal benefits of such expenses (Shafiq et al., 2019).

However, it is also imperative to consider the long-term financial benefits versus the costs associated with higher education. While initial investments can be significant, the potential to increase profits throughout life exceeds these costs. Therefore, strategic investment in higher education remains essential to encourage not only individual prosperity but also broader economic growth.

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Financial investments in education significantly influence the labour market results, impacting individual professional success and broader economic development. Kluge et al. (2019) argue that youth employment programs improve labour market conditions, contributing to better labour perspectives. In addition, active labour market policies are essential to improve employment rates, as evidenced by Vooren et al. (2019), who made a meta-analysis that highlights its effectiveness. Educational mismatches negatively affect the labour market labours, as Bol et al. (2019) emphasized the alignment between education and labour. In addition, Wachter (2020) points out that the initial conditions of the labour market can have persistent effects, underlining the importance of investing in education as a strategy for sustainable economic progress.

## 2.1 .Graduate Earnings as an Outcome

The level of education and financial investment in graduation significantly affects initial gains. The type of degree plays a vital role, as graduates in the STEM fields usually command higher wages than their peers in humanities (Colombo & Piva, 2020). In addition, the institution's quality influences employment perspectives; graduates from renowned universities tend to be guaranteed better-paid positions (Aina & Casalone, 2020). However, student debt can undermine these benefits, as high debt levels can restrict the financial flexibility of graduates (Chakrabarti et al., 2020). Finally, initial investments in education can produce substantial returns, but the relationship is complex and multifaceted (Caucutt & Lochner, 2020).

The long-term return on investment (king) in education in Saudi Arabia has considerably influenced economic growth, labour development, and social impact in the past two decades. Investment in education has become a central strategy to improve economic performance, as Altuwaijri and Kalyanaraman (2020) stressed, which underlines the relationship between the education of CEOs and organizational performance. The evaluation of the effectiveness of educational expenses, particularly in public universities, has been studied by executives, such as the balanced dashboard (Algobaisi & Sweiti, 2023), contributing to labour skills. In addition, integrating various studies programs, such as the OMS patient safety studies program, illustrates targeted investment in skills development (Felemban & Mohorjy, 2022). Finally, the progress of information and communication technologies within education policies reflects progressive strategies aimed at improving learning results, in addition to the initiatives observed in other countries (Alghamdi & Holland, 2020). Collectively, these dimensions illustrate the substantial king in the educational investments of Saudi Arabia, shaping a robust socioeconomic landscape.

## 2.2 .Investment in Higher Education

❖ **Tuition Fees:** Tuition fees significantly impact access to education, students' performance and global level of education, with substantial socioeconomic implications. High tuition fees serve as obstacles, particularly for low-income students, restricting their higher education opportunities (Baker, 2021). In addition, financial

pressure can negatively affect students' performance, resulting in decreased academic engagement and results (Jackson, 2020). Research indicates that treating educational costs can improve students' performance, stressing the importance of fair funding (Guryan et al., 2023). Potential reforms, such as free or subsidized tuition fees and targeted financial support, could promote fair learning opportunities and improve the quality of global education (Surur et al., 2020).

- ❖ **Government Subsidies:** Government subsidies play a crucial role in modelling educational accessibility in Saudi Arabia. By significantly reducing education costs, these subsidies aim to relieve financial obstacles for students, thus promoting human capital development (Almutairi, 2024). However, the challenges remain in ensuring that all the population segments are equal. For example, while subsidies can improve access, their impact can be threatened by inefficiencies in the implementation of policies (Islam & Ali, 2024). In addition, addressing related issues, such as physical education policy, is essential for holistic educational improvement (Albujulaya et al., 2023). Ultimately, government efforts are required to ensure the effectiveness of educational subsidies (Algahtany et al., 2023)
- ❖ **Parental/Family Support:** Family financial support significantly influences students' performance and concentration, positively and negatively affecting academic achievements and general wellbeing. On the one hand, the highest family socioeconomic status often correlates with better academic performance, as demonstrated by Liu et al. (2020), who found that the richest origins tend to achieve higher grades. On the contrary, financial limitations can lead to greater stress and distraction, affecting the cognitive approach (Rodríguez-Hernández et al., 2020). In addition, Mishra (2020) highlighted the importance of social support networks in helping academically underrepresented students; however, the effects of energy poverty can hinder general wellbeing and academic success (Zhang et al., 2021).
- ❖ **Scholarships and Grants:** Scholarships and subsidies are essential in improving academic performance and increasing student graduation rates. The financial emergency services provided by these programs alleviate the charges of tuition and subsistence costs, allowing students to focus on their studies. For example, the Promised Kalamazoo Stock Exchange has considerably improved registration and college completion rates, demonstrating the importance of financial support (Bartik et al., 2021). In addition, the motivation derived from the receipt of scholarships can promote a feeling of success and ambition, as shown in the analysis of Rubin and Rosser (2023) concerning student-athletes. Access to essential resources, including mentoring and tutoring programs, is crucial to promote the realization of STEM diplomas when return policies are implemented responsibly (LI, 2020). The effective targeting of scholarships for disadvantaged populations maximizes their potential impact on educational results, as evidenced by the results of Hoyos, Attanasio and Meghir (2024). Overall, scholarships and subsidies serve as essential catalysts for academic success and the

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increase in diploma rates.

❖ **Work-Study Programs and Part-Time Jobs:** The income generated by work and part-time jobs significantly impacts student academic results and their ability to balance work and personal life responsibilities. According to PološkiVokić, Rimac Bilušić and Perić (2021), students juggling work and studies often experience emotional consequences that affect their academic results. Beatson, de Lange and Oosthuizen (2021) found that accounting students have declared difficulties in maintaining a healthy study of study. In addition, Mahler (2020) discusses the unique challenges facing international students, highlighting the pressure of financial necessity on school performance. Hatcher and Hwang (2020) underline the importance of optimizing study-life balance to improve educational experiences.

## 2.3 .Skill Acquisition as a Mediating Variable

Skills acquisition refers to acquiring knowledge, competencies and skills in various domains, including technical, soft and professional skills. Technical skills are specific knowledge related to technological and vocational tasks, while soft skills cover interpersonal traits, such as communication and teamwork (Qizi, 2020). In addition, professional skills include a combination of technical and soft skills necessary for effective performance in the workplace. The importance of acquiring skills in higher education is profound since it improves the students' results, promoting employability and adaptability in a competitive labour market (Almeida & Morais, 2023; Mozgalova et al., 2021)

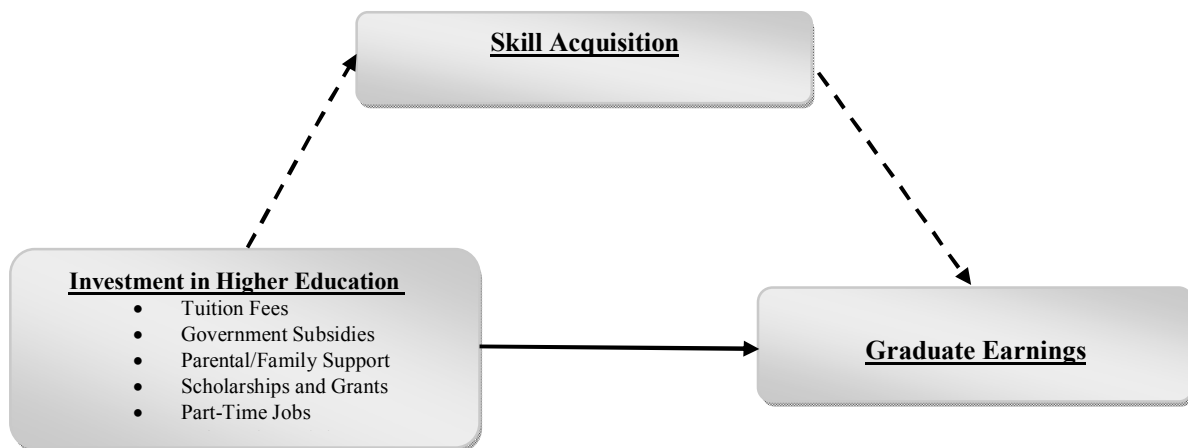


Fig. 1: Research framework. A solid arrow shows the direct relationship between Investment in Higher Education and Graduate Earnings. The dashed arrows illustrate the indirect route through which Skill Acquisition acts as a mediator for the impact of Investment in Higher Education on Graduate Earnings.

The present study investigates the influence of Investment in Higher Education on Graduate Earnings via the following main hypotheses:

— H1: Tuition Fees (TF) positively affect Graduate Earnings (GRE).

- H2: Government Subsidies (GS) positively affect Graduate Earnings (GRE).
- H3: Parental/Family Support (FS) positively affects Graduate Earnings (GRE).
- H4: Scholarships and Grants (SG) positively affect Graduate Earnings (GRE).
- H5: Work-Study Programs (WP) positively affect Graduate Earnings (GRE).

The present study investigates the mediating role of Skill Acquisition on the relationship between Investment in Higher Education and Graduate Earnings via the following hypotheses:

- H6: Skill Acquisition (SAC) mediates the relationship between Tuition Fees (TF) and Graduate Earnings (GRE).
- H7: Skill Acquisition (SAC) mediates the relationship between Scholarships and Grants (SG) and Graduate Earnings (GRE).
- H8: Skill Acquisition (SAC) mediates the relationship between Parental/Family Support (FS) and Graduate Earnings (GRE).
- H9: Skill Acquisition (SAC) mediates the relationship between Government Subsidies (GS) and Graduate Earnings (GRE).
- H10: Skill Acquisition (SAC) mediates the relationship between Work-Study Programs (WP) and Graduate Earnings (GRE).

### 3. MATERIALS AND METHODS

#### 3.1 Subjects

The study's subjects comprised 176 recent graduates from three universities in the Kingdom of Saudi Arabia: Al-Jouf University, Hail University, and Northern Border University. These participants all completed their higher education within the last three years. As outlined in Table 1: Sample Characteristics (N = 176), the sample represents a balanced distribution across gender, age groups, and fields of study, including STEM, Humanities, Social Sciences, and Business. This selection aims to assess the immediate post-graduation outcomes across different academic institutions and disciplines, providing insights into the effectiveness of educational investments in diverse regional university settings.

#### 3.2 Survey

A comprehensive survey was designed to gather data on the graduates' educational investments, skill acquisition, and subsequent earnings. The questionnaire was structured around the critical constructs of our study—Tuition Fees, Government Subsidies, Parental/Family Support, Scholarships and Grants, and Work-Study Programs—with questions tailored to quantify the extent and impact of these investments on the participants' skill development and financial outcomes. The skill acquisition component of the survey focused on evaluating the acquisition of technical, soft, and professional skills and their applicability in the job market. Graduate earnings were measured through questions about current earnings, salary progression, and satisfaction

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with their financial status post-graduation. The survey was distributed electronically to ensure a broad reach and facilitate efficient data collection, with all responses anonymized to maintain participant confidentiality and adhere to ethical research standards.

**Table 1: Sample Characteristics (N = 176)**

Characteristic	Categories	Percentage (%)
Gender	Male, Female	45% Male, 55% Female
Age Group	20-24, 25-29, 30+	40% (20-24), 35% (25-29), 25% (30+)
University	Al-Jouf University, Hail University, Northern Border University	33% (Al-Jouf), 34% (Hail), 33% (Northern Border)
Field of Study	STEM, Humanities, Social Sciences, Business	40% (STEM), 20% (Humanities), 25% (Social Sciences), 15% (Business)
Employment Status	Employed, Unemployed, Seeking Employment, Further Studies	60% (Employed), 20% (Unemployed), 15% (Seeking Employment), 5% (Further Studies)

## 4. RESULTS

Figure 3 depicts the measurement model of our study, examining how different forms of higher education investment—tuition Fees (TF), Government Subsidies (GS), Parental/Family Support (FS), Scholarships and Grants (SG), and Work-Study Programs (WP)—affect Graduate Earnings (GRE) through Skill Acquisition (SAC). This model maps out the hypothesized relationships, showing how each type of investment contributes to skill development, influencing earnings outcomes.

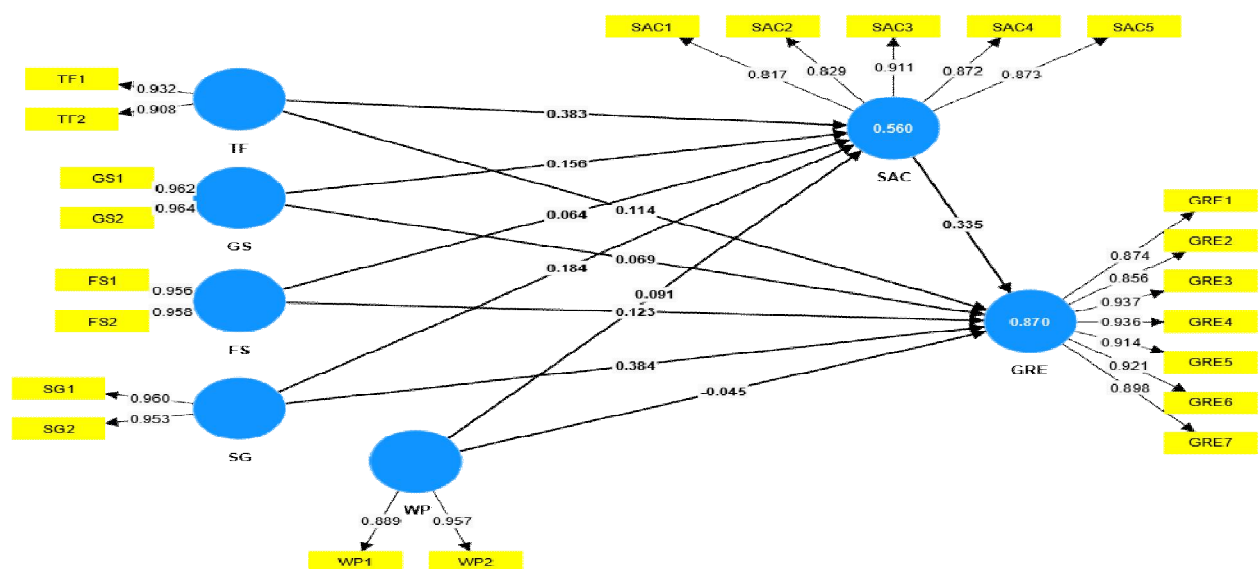


Fig.3: Measurement Model. FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

Table 3 assesses discriminant validity using the HTMT criterion among the constructs: Parental/Family Support (FS), Graduate Earnings (GRE), Government Subsidies (GS), Skill Acquisition (SAC), Scholarships and

Grants (SG), Tuition Fees (TF), and Work-Study Programs or Part-Time Jobs (WP). All HTMT values are below the threshold of 0.90, indicating that each construct is empirically distinct. This suggests that the constructs measure different concepts, and the model has adequate discriminant validity.

**Table 2: Summary of Measurement Model**

Constructs	Items	Loadings (>0.70)	VIF (<5)	Cronbach's Alpha (>0.70)	Composite reliability (rho_c)	Average Variance Extracted (AVE) (>0.50)
Graduate Earnings	GRE1	0.874	3.241	0.963	0.970	0.820
	GRE2	0.856	3.241			
	GRE3	0.937	3.493			
	GRE4	0.936	3.791			
	GRE5	0.914	4.718			
	GRE6	0.921	4.812			
	GRE7	0.898	4.294			
Skill Acquisition	SAC1	0.817	2.578	0.913	0.935	0.741
	SAC2	0.829	3.511			
	SAC3	0.911	3.693			
	SAC4	0.872	3.693			
	SAC5	0.873	2.541			
Investment in Higher Education	SG1	0.960	2.489	0.908	0.956	0.915
	SG2	0.953	3.699			
	TF1	0.932	3.519			
	TF2	0.908	3.056	0.821	0.917	0.847
	WP1	0.889	3.228			
	WP2	0.957	3.228	0.837	0.921	0.854
	FS1	0.956	1.938			
	FS2	0.958	1.938	0.908	0.956	0.916
	GS1	0.962	2.073			
GS2	0.964	2.073				
				0.921	0.962	0.927

The constructs are scrutinized in Table 3 by applying the Heterotrait-Monotrait (HTMT) ratio. The constructs under evaluation encompass Parental/Family Support (FS), Graduate Earnings (GRE), Government Subsidies (GS), Skill Acquisition (SAC), Scholarships and Grants (SG), Tuition Fees (TF), and Work-Study Programs or Part-Time Employment (WP). All HTMT values are below the conservative threshold of 0.85, which indicates adequate discriminant validity. For instance, the HTMT values between FS and other constructs range from 0.044 to 0.818, all within acceptable limits. The low HTMT values involving WP (e.g., WP and FS at 0.044) suggest that Work-Study Programs are conceptually distinct from other variables in the model. The results confirm that each construct is empirically distinct, supporting the measurement model's discriminant validity.

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**Table 3: Discriminant Validity (test Heterotrait-monotrait ratio (HTMT))**

	FS	GRE	GS	SAC	SG	TF	WP
FS							
GRE	<b>0.818</b>						
GS	0.772	<b>0.701</b>					
SAC	0.756	0.759	<b>0.762</b>				
SG	0.785	0.737	0.751	<b>0.745</b>			
TF	0.787	0.732	0.796	0.823	<b>0.634</b>		
WP	0.044	0.059	0.034	0.073	0.041	<b>0.052</b>	

\*A HTMT Ratio < 0.85 is considered valid.

**Note:** FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

Table 4 assesses discriminant validity using the Fornell-Larcker criterion. The bold diagonal values represent the square roots of the Average Variance Extracted (AVE) for each construct, which are all higher than their correlations with other constructs (off-diagonal values). This indicates that each construct shares more variance with its indicators than others, confirming adequate discriminant validity. Consequently, the constructs—such as Parental/Family Support (FS), Graduate Earnings (GRE), and Skill Acquisition (SAC)—are empirically distinct, supporting the validity of the measurement model.

**Table 4: Discriminant Validity (Fornell-Larcker criterion)**

	FS	GRE	GS	SAC	SG	TF	WP
FS	<b>0.827</b>						
GRE	0.759	<b>0.805</b>					
GS	0.789	0.729	<b>0.763</b>				
SAC	0.693	0.810	0.704	<b>0.761</b>			
SG	0.796	0.778	0.772	0.684	<b>0.757</b>		
TF	0.755	0.733	0.770	0.718	0.710	<b>0.720</b>	
WP	0.755	0.703	0.772	0.757	0.710	0.820	<b>0.724</b>

\*Following the Fornell-Larcker criterion, the bold value is accepted when it exceeds its row and column values.

**Note:** FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

Table 5 delineates the statistical metrics about the fit of the structural model alongside the effect sizes attributable to the independent variables influencing the dependent variables. The R-Square coefficients for Graduate Earnings (GRE) and Skill Acquisition (SAC) are recorded at 0.870 and 0.560, correspondingly signifying that the model accounts for 87% of the variance observed in GRE and 56% in SAC—both of which are regarded as substantial levels of explanatory efficacy. The adjusted R-squared values are slightly lower but denote a robust model fit. The f-square effect sizes reveal that Scholarships and Grants (SG) have a medium effect on GRE (0.190)

and a negligible effect on SAC (0.013). Tuition Fees (TF) show a negligible effect on GRE (0.020) and a medium effect on SAC (0.070). Parental/Family Support (FS), Government Subsidies (GS), and Work-Study Programs (WP) exhibit small to negligible effect sizes on both GRE and SAC. These findings suggest that SG and TF are more influential in predicting GRE and SAC, highlighting their significant roles in the educational investment and outcome process.

**Table 5: Model Structural Fit Criteria and F-square Effect Sizes**

Variables	R-Square	R-Square Adjusted	Variance Explained	f-square Effect Sizes
GRE	0.870	0.866	High	/
SAC	0.560	0.549	High	/
FS	/	/	/	GRE: 0.016 SAC: 0.001
GS	/	/	/	GRE: 0.005 SAC: 0.008
SG	/	/	/	GRE: 0.190 SAC: 0.013
TF	/	/	/	GRE: 0.020 SAC: 0.070
WP	/	/	/	GRE: 0.015 SAC: 0.019

Note: FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

Table 6 illustrates the outcomes derived from evaluating the direct influences of several investment determinants on Graduate Earnings (GRE). The independent variables scrutinized encompass Tuition Fees (TF), Government Subsidies (GS), Parental/Family Support (FS), Scholarships and Grants (SG), and Work-Study Programs (WP). The path coefficients (Original Sample, O) provide insights into the magnitude and orientation of each association.

The outcomes imply that Government Subsidies (GS → GRE) and Scholarships and Grants (SG → GRE) significantly contribute to GRE with strong positive effects, as shown by substantial t-statistics (5.986 and 4.210, respectively) and p-values beneath 0.01 ( $p < 0.01$ ). Work-Study Programs (WP → GRE) manifest a robust positive impact on GRE, corroborated by an elevated path coefficient (0.771), a significant t-statistic (14.185), and a p-value below 0.01. Tuition Fees (TF → GRE) demonstrate a relatively more minor yet statistically significant favourable influence on GRE ( $p < 0.05$ ), suggesting that increased tuition fees are correlated with enhanced graduate earnings. Conversely, Parental/Family Support (FS → GRE) fails to display a statistically significant influence on GRE ( $p = 0.258$ ), implying that familial financial contributions may not directly affect earnings outcomes.

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**Table 6. Direct Effects Hypotheses Testing**

Direct Hypotheses		Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
H1	TF -> GRE	0.114	0.109	0.078	1.448	0.048*
H2	GS -> GRE	0.335	0.335	0.056	5.986	0.000**
H3	FS -> GRE	0.123	0.120	0.109	1.131	0.258*
H4	SG -> GRE	0.384	0.381	0.091	4.210	0.000**
H5	WP -> GRE	0.771	0.777	0.054	14.185	0.000**
*p < 0.05, **p < 0.01						

**Note:** FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

Table 7 examines the mediating role of Skill Acquisition (SAC) in the relationship between various investment factors and Graduate Earnings (GRE). The mediation concepts analyze if Student Aid Capital (SAC) plays a role as a bridge through which Tuition Fees (TF), Scholarships and Grants (SG), Parental/Family Support (FS), Government Subsidies (GS), and Work-Study Programs (WP) shape Graduate Earnings (GRE). The findings reveal that SAC appreciably mediates the association between Tuition Fees and Graduate Earnings (TF → SAC → GRE), presenting an original sample estimate of 0.128, a t-statistic of 2.636, and a p-value of 0.008 (p < 0.01).

Likewise, the mediation effect is statistically significant for Scholarships and Grants (SG → SAC → GRE), evidenced by a p-value of 0.041 (p < 0.05). Government Subsidies (GS → SAC → GRE) also show a significant mediation effect (p = 0.046), albeit with a smaller path coefficient. Work-Study Programs (WP → SAC → GRE) exhibit a robust and highly significant mediation effect, with an original sample estimate of 0.645, a t-statistic of 10.983, and a p-value of 0.000 (p < 0.01). This suggests that participation in work-study programs greatly enhances skill acquisition, which in turn leads to higher graduate earnings. In contrast, Parental/Family Support (FS → SAC → GRE) does not demonstrate a significant mediation effect, as indicated by a low t-statistic of 0.416 and a p-value of 0.677. This implies that while family support may contribute to education, it does not significantly impact graduate earnings through skill acquisition in this model.

**Table 7. Mediation Hypotheses Testing**

Mediating Hypotheses		Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
H6	TF -> SAC -> GRE	0.128	0.128	0.049	2.636	0.008**
H7	SG -> SAC -> GRE	0.062	0.066	0.038	1.639	0.041*
H8	FS -> SAC -> GRE	0.021	0.021	0.051	0.416	0.677*
H9	GS -> SAC -> GRE	0.052	0.050	0.046	1.136	0.046*
H10	WP -> SAC -> GRE	0.645	0.651	0.059	10.983	0.000**
*p < 0.05, **p < 0.01						

**Note:** FS (Parental/Family Support), GRE (Graduate Earnings), GS (Government Subsidies), SAC (Skill Acquisition), SG (Scholarships and Grants), TF (Tuition Fees), and WP (Work-Study Programs or Part-Time Jobs).

## 5. DISCUSSION

Our study examined the impact of various forms of investment in higher education on graduate earnings, specifically through the mediating role of skill acquisition. The findings offer compelling insights that align well with existing literature and deepen our understanding of the complex interplay between education financing and economic outcomes.

**Compatibility with Literature Review** The literature underscores that investments in higher education, such as tuition fees, government subsidies, and scholarships, significantly enhance the income potential of graduates. This aligns with Hryhorash et al. (2023), who noted the substantial impact of the quality and financing of education on earnings. Similarly, our study found that these investments positively influence graduate earnings, with tuition fees and scholarships showing solid effects on graduate income, corroborating Rudakov and Roshchin's (2019) findings on the correlation between academic investment and profit potential.

Moreover, the literature highlights that higher education catalyzes human capital development, which is essential for economic growth and innovation (Bonaccorsi et al., 2024). Our results mirror this perspective, illustrating how scholarships and government subsidies support academic achievement and enhance skill acquisition, which positively impacts earnings. This mediation effect supports the argument by Shafiq et al. (2019), emphasizing the role of educational investments in socioeconomic mobility, particularly in developing contexts.

**Skill Acquisition as a Mediating Factor** Our study uniquely contributes to the discourse by quantifying the mediating effect of skill acquisition. This aspect of our research dovetails with the discussions by Almeida and Morais (2023), highlighting the pivotal role of skill acquisition in enhancing employability and adapting to the competitive labour market. For instance, work-study programs substantially mediated the relationship between investment and earnings, suggesting that practical, job-related skills acquired through such programs significantly enhance graduate earnings.

**Economic Implications of Educational Investments** Consistent with the broader economic theories discussed by Kluge et al. (2019) and Vooren et al. (2019), our findings suggest that active labour market policies, which include educational strategies, effectively improve employment rates and economic conditions. The significant effects of scholarships, tuition fees, and work-study programs on skill acquisition and subsequent earnings underscore the need for well-aligned education policies that foster market-relevant skills.

**Limitations Versus Long-Term Gains** While acknowledging the immediate financial burdens of higher education, as noted by Chakrabarti et al. (2020), our study supports the notion that substantial long-term gains

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in graduate earnings offset these upfront costs. This observation is in line with Caucutt and Lochner (2020), who argued that initial educational investments yield significant returns, reinforcing the strategic importance of investing in higher education for individual and economic advancement.

In conclusion, our study confirms several established theories regarding the economic benefits of higher education. It enhances our understanding by illustrating how skill acquisition is a critical bridge between educational investments and improved economic outcomes. These findings advocate for policies that enhance access to quality education and support mechanisms that promote practical skill development, ultimately contributing to sustainable economic growth and social wellbeing.

## 6. CONCLUSIONS

This study has explored the intricate relationship between investment in higher education and postgraduate earnings in Saudi Arabia, emphasizing the mediating role of skill acquisition. The findings suggest that while educational investments such as tuition fees, government subsidies, and vocational training programs positively influence graduate earnings, the actual value of these investments lies in their ability to foster relevant, market-ready skills. Graduates who acquire practical, technical, and soft skills are better equipped to meet labour market demands and enjoy higher earning potential.

The research highlights the critical importance of aligning educational offerings with the evolving needs of the Saudi economy, particularly in the context of Vision 2030. As Saudi Arabia shifts towards a knowledge-based economy, the need for educational institutions to adopt more practical and skill-oriented curricula becomes increasingly apparent. Traditional models of education that emphasize theoretical knowledge without practical application are insufficient in preparing graduates for the modern workforce.

Additionally, the study has underscored the role of Vocational Education and Training (VET) programs in bridging skill gaps, offering a faster and more direct pathway for individuals to gain employable skills. These programs are essential for creating a more inclusive educational environment that supports socioeconomic mobility, particularly for those who may not pursue traditional academic routes.

Despite the progress made in educational reforms, gaps must be addressed to effectively connect educational outputs with labor market demands. This disconnect has led to some graduates being underprepared for the workforce, impacting their earnings and career trajectories. Therefore, continuous collaboration between academia, industry, and policymakers is crucial to ensure educational programs remain relevant and responsive to market needs.

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