



The Use of Time Series in Predicting the Role of the Applied College, Khamis Mushait Branch (Female Students), in Meeting the Labor Market's Demand for Intermediate Jobs Over the Next Ten Years (2025-2035)

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Abstract: The study revealed that technical and administrative disciplines such as Information Systems, Application Development, Cybersecurity, and Business Administration are the most aligned with labor market needs in the Asir region. In contrast, some programs, such as Beekeeping and Forest Technology, recorded low employment rates. The results showed an increase in student admissions until 1448 AH, followed by a stabilization at 3,223 female students annually, indicating a balance between supply and demand in the future. Additionally, the findings indicated a statistically significant positive correlation between the number of admitted students at the Applied College and the labor market demands in the Asir region. This suggests that higher admissions are associated with increased demand for the college's offered disciplines. Furthermore, time series forecasting showed that the number of admitted students will stabilize at 3,223 annually after 1448 AH. This trend may be due to market saturation or the stabilization of the college's capacity.

Keywords: Applied College, Labor Market Needs, Time Series

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Introduction:

Saudi Vision 2030 has outlined a roadmap for economic and developmental progress to position the Kingdom as a leading model across various sectors. In pursuit of a prosperous future and sustainable development, the vision includes several goals aimed at enhancing the strategic direction of the country towards human resource development. This is achieved through the provision of specialized knowledge in priority fields, improving the readiness of young men and women to enter the labor market, and expanding applied and vocational training to meet market demands.

Accordingly, Princess Nourah bint Abdulrahman University aims to enhance the outcomes of its education and training system to reach global standards. This is accomplished through educational, qualification, and training programs that align with contemporary advancements and the demands of the Fourth Industrial Revolution, ensuring compatibility with both local and global labor market needs. These efforts are further reinforced through partnerships with relevant entities at the local and international levels. To contribute to this vision, the Applied College offers its students a variety of programs based on applied education in multiple fields, such

as Computer and Information Technology, Tourism and Hospitality, Administrative Sciences, Electronics and Communications Engineering, and others. These programs aim to prepare a national female workforce with diploma degrees aligned with local labor market needs and national development goals (Al-Madina Newspaper, 2019).

The Applied College is considered one of the most significant colleges within Saudi universities, as it is an extension of the Community College and the Deanship of Community Service and Continuing Education. Based on this foundation, the college's objectives and directions focus on offering flexible programs that align with the evolving labor market requirements. Additionally, the college fosters active partnerships with the public, private, and non-profit sectors to strengthen its role in community development and workforce preparation. It also strives to enhance the skills and competencies of students enrolled in diploma programs and training courses, thereby increasing their professional proficiency (General Administration for Digital Transformation Design and Development, 2024).

Applied colleges in Saudi Arabia were established to meet the growing demand for higher education among high school graduates. Initially, they offered only one specialization— a diploma in Computer Science. The Eastern Province was among the first to benefit from these colleges, with the establishment of the Applied College in Qatif in 1423 AH. The college continued to offer this specialization until 1434 AH, when its programs were expanded to address labor market needs by introducing various disciplines in financial sciences, administrative sciences, and computer science.

In 1442 AH, the University Affairs Council issued a decision to convert Community Colleges into Applied Colleges, introducing specialized programs that align with Saudi Vision 2030. These programs aim to qualify a national workforce with diploma degrees linked to professional certifications that support development objectives.

Through its enhanced programs, the college has sought to prepare well-equipped and highly trained human resources to meet labor market demands. As a result, specialized programs were introduced, offering an intermediate diploma degree over two years, with coursework delivered in English. Additionally, the college encourages students to participate in various curricular and extracurricular activities during their studies, including volunteer work, cultural, religious, and scientific initiatives. This approach aims to foster a spirit of initiative, volunteerism, and social responsibility while promoting excellence, generosity, and a commitment to national development.

Among the academic programs offered at the Applied College at King Khalid University are:

- **Culinary Arts (Female Students)**
- **Legal Assistant Program**
- **Business Law Program**
- **Tourism and Entertainment Project Management**
- **Environmental Waste Management**
- **Forest Technology**
- **Beekeeping**
- **Smart Agriculture**
- **E-Marketing**
- **Business Administration**

- **Web and Mobile Application Development**
- **Information Systems**
- **General Intermediate Diploma in Tourism and Entertainment Management**
- **General Intermediate Diploma in Cybersecurity**

Literature Review

Challenges Facing Community Colleges:

- Approximately **19,000 students** are admitted to community colleges annually.
- There is a **9.6% gap** between actual and targeted high school admission rates.
- The **unemployment rate** among community college graduates is continuously increasing.
- The **business sector lacks confidence** in the graduates of these colleges.
- The **specializations offered do not align** with actual labor market demands.

Key Solutions:

- Transitioning to **Applied Colleges** to enhance employability.
- **Diversifying academic programs** to better align with labor market needs.
- Expanding **career-oriented diploma programs** that meet actual market demands.
- **Reducing admissions** in theoretical disciplines to focus on applied education.

Recommendations for Development:

- Strengthening **collaboration and integration** between community and applied colleges within the same region.
- Establishing **partnerships with business sectors** to design and implement specialized diploma programs tailored to regional market needs.
- Focusing on diploma programs that **align with the economic and industrial identity** of each region.
- **Creating advisory boards** with local business leaders to ensure graduate employment.
- **Providing financial incentives** for students enrolled in applied and community studies colleges.
- Introducing **tuition-based programs** for individuals such as bachelor's degree holders or working professionals seeking evening diploma programs.
- **Government support** for colleges by engaging ministries and relevant authorities (e.g., Ministry of Labor, Ministry of Civil Service) to promote job localization.
- Leveraging the graduates of **the King's Scholarship Program** by training them for employment in community colleges.
- Granting **greater autonomy to colleges** to develop self-financing strategies.

(Source: Al-Madina Newspaper, December 14, 2019)

Previous Studies

- **Al-Khalwi (2020):** This study aligns with the current research in its objectives and some of its findings.

- **Saudi Labor Market Needs Assessment Study (Misk Academy, 2020):** This study shares similarities with the research in analyzing labor market demands.
- **Zgawa Ahmed (2017):** This study matches the current research in terms of methodology, objectives, and some results.

Research Data Description

This study relies on a dataset designed to analyze the relationship between the number of admitted female students at the Applied College and the labor market needs in the **Asir region**. The dataset includes **both quantitative and qualitative variables**, allowing for a comprehensive analysis of the factors influencing employment opportunities for graduates.

The **primary variable** is the **annual number of admitted students** from **1438 to 1446 AH**, a numerical quantitative variable obtained from the official college records. Additionally, **labor market demand data** were collected, reflecting the employment rate of diploma graduates based on labor market statistics from the **General Authority for Statistics**.

Moreover, the study incorporates information on **available academic programs** at the Applied College, classified as a **categorical qualitative variable**. The **employment rate for each program** was also analyzed, a **relative quantitative variable** that indicates the proportion of graduates employed in each specialization, helping assess the alignment between academic programs and market demands.

To forecast future trends, a **time series analysis** was conducted using the **ARIMA(1,1,1) model** to predict the number of admitted students from **1447 to 1456 AH**, providing insights into the future enrollment trends at the college. Finally, the study examines the **distribution of available jobs across different sectors in the Asir region**, a **relative quantitative variable** that helps identify the most in-demand industries. This analysis supports academic decision-making and strategic planning to develop study programs that align with labor market needs.

Research Hypotheses

- 1- **There is a statistically significant relationship between the number of admitted female students at the Applied College and labor market demands.**

**Table (1): Relationship Between the Number of Admitted Students
and Labor Market Needs**

Labor Market Needs	Significance (p-value)
Number of admitted students at the Applied College	0.673

The analysis results reveal a **strong positive correlation** between the **number of admitted students and labor market demands**, indicating that increased enrollment in the college aligns with job market demand in the region. Furthermore, the relationship between college enrollment and labor market needs was found to be **moderately positive and statistically significant**, reinforcing the notion that a rise in admitted students reflects labor market requirements.

- 2- **There is a positive correlation between female students' enrollment in the Applied College and labor market demands.**

**Table (2): Relationship Between Students' Enrollment
in the Applied College and Labor Market Needs**

Labor Market Needs	Significance (p-value)
Students' enrollment in the Applied College	0.521

Table (2) illustrates the relationship between **students' enrollment in the Applied College** and **labor market needs**, with a **correlation coefficient of 0.521**. This indicates a **moderate positive correlation** between the two variables, meaning that an increase in college enrollment aligns with rising labor market demands. Additionally, the **p-value (0.021) is below 0.05**, confirming that the relationship is statistically significant and can be relied upon for future trend analysis.

These findings highlight the **importance of continuously developing academic programs** to align with labor market demands, ensuring that graduates have **enhanced employment opportunities** in high-demand fields.

- 3- **There is a statistically significant relationship between academic programs at the Applied College and labor market demands.**

Table (3): Relationship Between Academic Programs and Expected Employment Rates

Program	Expected Employment Rate (%)
Information Systems	90%
Application Development	85%
Cybersecurity Diploma	85%
Business Administration	80%
E-Marketing	75%
Business Law	70%
Legal Assistant	65%
Tourism Project Management	60%
Tourism Diploma	60%
Culinary Arts	55%
Environmental Waste Management	50%
Smart Agriculture	50%
Forest Technology	45%
Beekeeping	40%

Table (3) analyzes the relationship between **academic programs** and **labor market demands**. The results highlight that **technology-related fields**, such as **Information Systems (90%)**, **Application Development (85%)**, and **Cybersecurity Diploma (85%)**, have the highest expected employment rates, reflecting the increasing demand for **digital and technological skills**.

Additionally, **Business Administration (80%)** and **E-Marketing (75%)** show **high employment potential**, indicating the **continued demand for managerial and marketing expertise**.

Conversely, **environmental and agricultural programs**, such as **Forest Technology (45%)** and **Beekeeping (40%)**, exhibit the **lowest employment rates**, suggesting **limited job opportunities** in these fields or a **need for development** to align with **modern market requirements**.

These findings underscore the **importance of aligning academic programs with high-demand sectors, enhancing disciplines that offer broad employment opportunities, and considering the modernization or integration of low-demand specializations** to enhance their competitiveness in the job market.

Forecasting the Role of the Applied College (Khamis Mushait - Female Branch) in Meeting Labor Market Needs for Intermediate Jobs (2025-2035)

In this study, the **ARIMA(1,1,1)** model was employed to analyze **admissions data from 1438-1446 AH** and predict future trends **until 1456 AH**. The results indicate a **steady increase in student admissions until 1448 AH**, followed by a **stabilization at 3,223 students annually**, suggesting a **balanced supply and demand in the future**.

This forecasting model is effective in predicting **short- to medium-term trends**, providing valuable insights for strategic **academic planning and labor market alignment**.

Table (4): Forecast of Female Student Admissions at the Applied College (2025-2035)

Hijri Year	Predicted Number of Admitted Students
1447	3164
1448	3211
1449	3221
1450	3223
1451	3223
1452	3223
1453	3223
1454	3223
1455	3223
1456	3223

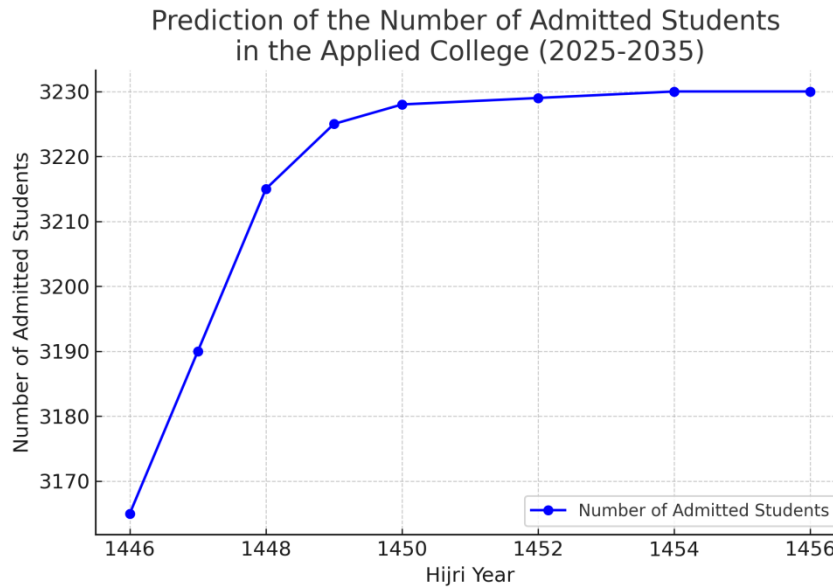
The **forecast of student admissions at the Applied College (Khamis Mushait - Female Branch) for the period 1447-1456 AH** demonstrates an **upward trend in student intake until 1448 AH**, where the projected number of admitted students reaches **3,211**. After that, admissions **stabilize at 3,223 students annually** starting from **1449 AH**.

This trend suggests a **growing demand for enrollment in the coming years**, followed by a **plateau** that could be attributed to:

- **Capacity limitations of the college,**
- **A balance between supply (graduates) and demand (labor market needs), or**
- **Shifts in educational policies and labor market requirements.**

These projections emphasize the need to **analyze the factors influencing this stabilization**, including:

- **The alignment of academic programs with labor market demands,**
- **Education policies affecting admissions, and**
- **Future workforce trends in the Asir region.**



To ensure continued alignment between education and employment, it is crucial to conduct periodic assessments and adjust admission strategies based on economic and educational changes.

Table (5): Analysis of Available Job Opportunities in Various Sectors in Asir Region

Sector	Percentage of Available Jobs (%)
Technology	30%
Management	18%
Law	15%
Cybersecurity	15%
Marketing	12%
Tourism	10%
Food Industries	5%
Agriculture	4%
Environment	3%

The analysis of **available job opportunities** in different sectors within **Asir Region** reveals key insights into labor market trends:

- **Technology ranks first (30%)**, highlighting the **high demand for tech-related disciplines** such as **Information Systems, Application Development, and Cybersecurity**.
- **Management (18%)** follows, alongside **Law and Cybersecurity (15% each)**, indicating a **sustained need for administrative, legal, and security expertise**.
- **Marketing (12%) and Tourism (10%)** reflect **moderate demand**, emphasizing their role in **supporting the local economy**.

- **Traditional industries like Food (5%), Agriculture (4%), and Environment (3%) show the lowest employment rates, which may suggest either lower demand or a need to modernize and align these fields with contemporary market needs.**

Discussion of Results

First: The Relationship Between College Admissions and Labor Market Needs

The study results indicate a **statistically significant positive correlation** between the number of female students admitted to the applied college and labor market demands in Asir. This suggests that an **increase in admissions aligns with the growing demand for the disciplines offered by the college.**

This finding aligns with **previous studies** examining the relationship between higher education and labor market requirements. For example, **Hilal (2020)** emphasized that **academic institutions that adapt to market demands tend to achieve higher graduate employment rates.**

However, the results contrast with **Abdelhamid (2024)**, which argued that **a rise in admissions does not necessarily translate into increased employment opportunities.** The study highlighted that employment rates are **contingent on the relevance and quality of disciplines rather than mere enrollment numbers.**

Second: The Impact of Academic Programs on Employment

The study revealed that **technical and administrative disciplines—such as Information Systems, Application Development, Cybersecurity, and Business Administration—are the most aligned with labor market needs in Asir.** In contrast, **some programs, such as Beekeeping and Forest Technology, recorded lower employment rates.**

These findings are **consistent** with **Bin Nasser (2020)**, which confirmed that **demand for technical disciplines in Saudi Arabia is increasing due to the digital transformation of the economy.** However, they **contradict Mokhzenji (2024)**, which argued that **agricultural and environmental fields could gain significance in the future if linked to sustainability initiatives and the green economy shift.**

Third: Stabilization of Student Admissions After 1448 AH

Time series forecasting indicated that **the number of female students admitted will stabilize at 3,223 annually after 1448 AH.** This trend **could be due to market saturation or the college's intake capacity reaching its limit.**

This result is **consistent** with **Mandour (2023)**, which found that **expanding university admissions often stabilizes after reaching an equilibrium between supply and demand.** However, it **differs** from **Al-Bahnassawi (2018)**, which suggested that **stable admission numbers might indicate weak academic guidance rather than labor market saturation.**

Study Recommendations

1. It is recommended to increase focus on high-demand specializations such as **Information Systems, Application Development, Cybersecurity, and Business Administration** by providing more study seats, improving curricula, and incorporating modern teaching technologies.
2. Based on labor market analysis, some programs, such as **Beekeeping, Forest Technology, and Environmental Waste Management**, need to be re-evaluated—either by **developing curricula** to meet market needs or **merging them with other more in-demand specializations.**
3. To ensure graduates align with labor market needs, it is advisable to **establish agreements with leading companies and institutions** in high-demand sectors and provide **cooperative and field training opportunities** for female students to enhance their job readiness.

4. The college may consider **adding new specializations** that align with market transformations, such as **Artificial Intelligence, Data Analytics, and Digital Project Management**, as future trends indicate an increasing demand for these fields.
5. Since labor market demands are constantly changing, it is essential to **conduct periodic studies and surveys** in collaboration with relevant entities to ensure that academic programs continue to align with the actual labor market needs in the Asir region.
6. It is recommended to **organize awareness and guidance campaigns in secondary schools** to introduce female students to the importance of applied specializations and their role in securing future job opportunities, thereby increasing enrollment in priority programs within the labor market.
7. To enhance **education quality and employment opportunities**, laboratories and digital labs should be developed, and **e-learning should be utilized** to strengthen students' skills in modern technologies, improving their readiness for a competitive job market.

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