The Reality of Using Fourth Industrial Revolution Technologies in Light of the Saudi Labour Market Requirements: A Field Study at King Saud and Prince Sultan Universities

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Abstract - **The present descriptive-analytical study was aimed to examine the status of using the Fourth Industrial Revolution technologies by the university male and female students considering the requirements of the Saudi labor market. As part of the Fourth Industrial Revolution, focus has been made on artificial intelligence (AI), metaverse and social media. The researcher adopted the quantitative approach whereby data were collected through a researcher-designed questionnaire. The study was applied on a sample of (46) male and female students at King Saud University and Prince Sultan University. Among the most prominent findings was that the respondents of both sexes rated their use of AI technology and social media as "often", while they "rarely" used the metaverse technology. A difference was found in their use of these technologies attributed to gender and type of university.**

Keywords: Fourth Industrial Revolution technologies, labor market, Saudi Arabia.

Introduction:

The world has witnessed massive developments in the field of Fourth Industrial Revolution, including AI and IT technologies. There is no doubt that these technologies contribute to improving the people's daily lives and creating changes in various industries. The countries, particularly the technologically advanced ones, compete to achieve progress and innovation in this field. In this context, these technologies create job opportunities and promote the standard of living through raising payments and income. However, the difficulty of adapting to these technological developments may exacerbate the unemployment problem in the short run, but these developments may reduce the unemployment rates, particularly in the event that they increase and improve the quality and structure of GDP (Kareem & Ahmad., 2024).

Even though there has been a positive impact by the Fourth Industrial Revolution on economic growth, it is still necessary to address its expected negative impact on the labor market. The concerns on the impact of technology on jobs are not new. In 1931, economist John Naynard Keynes warned against the spread of technological unemployment "due to our discovery of means economizing the use of labor outrunning the pace at which we can find new uses for labor." (Schwab, 2016).

Related literature shows that developed countries have started earlier in studying the technological developments and put up policies for addressing them. The developing countries, on the other hand, are still in the adaptation. There have been many studies referring to automation and digitalization in the age of the Fourth Industrial Revolution as invariably affecting various industries. This makes some jobs more liable to replacement, while the need is arising for jobs that require advanced skills and cannot be automated (Malkawi, 2016) (Al-Adadi& Al-Abdi, 2025).

The Fourth Industrial Revolution has unleashed so deep transformations in the labor landscape. It has also left sinister impacts on the patterns of hiring and labor; leading in many parts of the world to increasing unemployment rates and spreading some social phenomena, including higher crime and delinquency rates. For nearly four decades, debates have started among the sociologist community on the impact of automation on the workers and their skills. Some sociologists see that a new phenomenon "i.e. a culture of quick hire and fire" has emerged in some work environments and started to influence the traditional social culture that was represented by the life job or life work (Algarni et. Al., 2024) (Giddins, 2005).

The universities are pioneering in offering advanced educational and training programs the Fourth Industrial Revolution technologies phase (Malkawi & Hallasa, 2016). They also focus on the development of digital skills based on the needs of the labor market. They are motivated by the

pivotal role delegated to them in establishing sustainable community development, and preparing human resources that underlie the human capital of societal organizations, not only at the level of local labor market, but also preparing them for meeting the requirements at the level of international labor market.

Even though there have been numerous studies that targeted the university roles of meeting the requirements of the labor market, there has been no single study, to the best knowledge of the researcher, that investigated the status of the male and female university students' use of the Fourth Industrial Revolution technologies. So there is no evidence of any study in this regard that reflects the students getting ready for the labor market requirements, or achievement of job security, which increases the significance of the present study.

Study problem:

The Future of Jobs Report by the World Economic Forum (2025) gives details about the impact of technology change and other factors on shaping and transforming the international labor market by 2030. It is expected that (60%) of employers will digitalize and automate their works, leading to a varying degree on jobs and feeding demand for the technology-related skills, including artificial intelligence.

A study by Bordot (2022) analyzed the relationship between artificial intelligence and robots and the unemployment rates in 33 countries of the Organization for Economic Co-operation and Development (OECD) (2005-2017) found that the robots largely affected the unemployment rates of individuals with medium educational level (Kareem & Ahmad., 2024).

A study by Al-Adadiand Alabdi (2025) on male and female employees in various sectors in the Kingdom of Saudi Arabia showed that most employees depend on traditional skills, with a very evident weakness in digital skills. The percentage of employees who received professional training related to the digital revolution did not exceed (22%), while the results indicated that about (47%) of employees work in jobs that were liable to replacement at various degrees by technologies.

The General Authority for Statistics published a newsletter on the Saudi labor market for the second quarter of 2025. The total percentage of the Saudi and non-Saudi share in the workforce was (76.1%). The total unemployment percentage of the Saudi and non-Saudi workforce was (3.2%). The percentage of the Saudi share in the workforce was (49.2%), while their share in unemployment was (6.8%). The results showed that the share of the Saudi male in the workforce was (64%), and the Saudi female share was

(34.5%). Accordingly, the universities are generally to keep pace with the requirements of the labor market, and prepare graduates to deal with the harsh competition in the labor market, whether presently or in the future. This is to be done through promoting skills in using the Fourth Industrial Revolution technologies (viz., AI, metaverse, social media) to qualify and prepare the graduates to the labor market and achieve the largest possible job security for them.

Therefore, the study problem can be defined by answering the main question:

What is the status of using the Fourth Industrial Revolution technologies by the university male and female students considering the labor market requirements? This question is broken down into the following sub-questions:

1. What is the status of using the Fourth Industrial Revolution technologies (i.e., AI, metaverse, social media) by the male and female students of King Saud and Prince Sultan universities?
2. Are there statistically significant differences perceived by the subjects about their use of AI, metaverse and social media attributed to their personal variables (i.e., gender, type of university)?
3. What are the main job skills that meet the requirements of the Saudi labor market considering the Fourth Industrial Revolution?

Study objectives:

The main objective of this study is to know the status of using the Fourth Industrial Revolution technologies by the university male and female students considering the requirements of the Saudi labor market, based on achieving the sub-objectives below:

1. Understanding the status of using the Fourth Industrial Revolution technologies (i.e., AI, metaverse, social media) by male and female students of King Saud and Prince Sultan universities as the most relevant requirements for the Saudi labor market.
2. Understanding if there are statistically significant differences perceived by the subjects about their use of AI, metaverse and social media attributed to their personal variables (i.e., gender, type of university).
3. Understanding the main job skills that meet the requirements of the Saudi labor market considering the Fourth Industrial Revolution.

Study significance:

The significance of this study stems from the need to know the status of using the Fourth Industrial Revolution

technologies and applications (i.e., AI, metaverse, social media) by male and female students at King Saud and Prince Sultan universities considering the Saudi labor market requirements in a manner that achieves them job security as follows:

Academic significance:

- Shedding light on the main job skills that achieve job security in the Saudi labor market considering the Fourth Industrial Revolution requirements.
- Highlighting the most important sociological theories that predicted the impact of technology on the future of social life and jobs, and how to employ them in the present study.

Practical significance:

Activating partnership and increasing cooperation among the Saudi universities, including King Saud and Prince Sultan universities on one hand, and the production and service sector on the other hand to fill gap between education outcomes and needs of the labor market, to achieve job security considering the Fourth Industrial Revolution requirements.

Study boundaries:

Subjective boundaries:

They fall in investigating the status of using the Fourth Industrial Revolution technologies (i.e., AI, metaverse, social media) by male and female students at King Saud and Prince Sultan universities as the most important requirements of the Saudi labor market. They also underlie understanding whether there are statistically significant differences in the respondents' perceptions of their use of AI, metaverse and social media attributed to their personal variables (i.e., gender and type of university), and shedding light on the main job skills that meet the requirements of the Saudi labor market considering the Fourth Industrial Revolution.

Temporal boundaries:

This study was conducted during the 2025-2026 academic year.

Study terminology:

Fourth Industrial Revolution:

Schwab (2016) explained that it is a sudden and fundamental change that resulted in a deep change in the economic systems and social structures.

The International Labor Organization (ILO) defined it as a convergence of various physical, biological and digital activities and worlds that will reduce the gap between all that is material and digital. In other words, it increases the integration of smart machine systems connected with the ultra-high-speed broadband Internet.

Saudi labor market:

The Saudi labor market comprises organizations of the non-profit sector, private sector and government sector. It is the framework where the national and expatriate workforce meets the needs of employers and economic sectors in the Kingdom to organize and distribute job opportunities, as well as ensure alignment between the workforce skills and requirements of economic development.

Theoretical framework:

Given the revolutionary developments witnessed in our present time, represented by the Fourth Industrial Revolution, the graduates' work issue and the achievement of job security considering the Fourth Industrial Revolution requirements, form a major challenge that is being encountered by educational and training institutions (Office of Gulf Network for Quality Assurance in Higher Education in the GCC, 2022).

The works by Taylor, Henri Fayol, Max Weber, Elton Mayo and others contributed to establishing the fundamentals on which the contemporary organizational thought depends. They paved the way for offering a psychological understanding to the most important problems from which the organizations are suffering because of the way through which the individuals and groups inside them work. They also helped in understanding some behaviors that are made by some social actors (workers) to change certain conditions to achieve certain purposes. These attempts may bypass the individual to become a group problem, expressed through labor movements linked to social change (Zawawi, 2022).

The danger lies in that the Fourth Industrial Revolution may lead to the dark side of future work, which is described by Lynda Gratton, the professor of administrative practices at Business London School as an increase in the levels of fragmentation, isolation and exclusion in societies. We must consider that the matter is not related to the talent or skills only, but there must be a sense of the goal considering increasing mix of complexity and excessive specialization. The matter becomes more challenging because the technologies that support the Fourth Industrial Revolution play a role and have a significant impact on how to lead the businesses, organize them and obtain the resources (Schwab, ibid).

Considering skills and knowledge of future jobs needed by the labor market, there is a larger percentage of employers

surveyed by the World Economic Forum about the future jobs see that there will be large transformation and difference in most skills and knowledge required from the graduates to perform most jobs (Al-Ruhayli, 2021).

Themes of the future vision for the roles of the Saudi universities in preparing their students:

- Developing the students' skills and competencies at the Saudi universities.
- Bolstering the direct links among the Saudi universities and the labor market.
- Promoting education and learning at the Saudi universities.
- Developing the academic disciplines at the Saudi universities.
- Developing the graduates' education policies and planning at the Saudi universities.

Requirements of the Saudi labor market:

The labor market is influenced by many factors, including the government policies and technological developments and cultural and social changes. The specialties and skills that were required in the labor market in the past need development to keep pace with the developments taking place in the labor market. Among the most prominent skills of the Saudi labor market were writing skills, social skills and personal skills (Malkawi et. Al., 2021) (Al-Qara'wi, 2022) and the following:

1. Technological skills: It is evident that the Fourth Industrial Revolution which the world has been witnessing lately is led by the technological inventions, such virtual reality (VR), artificial intelligence (AI), big data science, augmented reality (AR), blockchain, and others. This draws attention to the importance of understanding the impact of the Fourth Industrial Revolution technologies on businesses, jobs, and life in general.
2. Emotional intelligence: It is the ability to manage emotions and feelings appropriately, exercise self-control, be enthusiastic and persevere, and be aware of others' reactions and their emotions, can establish effective relationships with them, and motivate them to do what is good for them (Al-Amri, 2018).
3. Analytical and critical thinking: The individual can reach creative solutions to solve complex problems using logic, and evaluate arguments to reach the best possible solution.
4. Pluralism and cultural intelligence: Because of the openness witnessed by the world and work environment, possessing the skills that make others accept and respect

the one's ideas has become inevitable to make the organization's services and products unique.

5. Communication skills with others: It is the individuals' ability to carry on effective communication. This side underscores the role of social media and the value of possessing effective communication skills, through which they can use voice tone and body language to deliver the message successfully to the other side.

Review of related literature:

Al-Sagheer's study (2024) proposed a framework for the development of qualitative external efficiency of university education in the Kingdom of Saudi Arabia as perceived by the faculty members according to the requirements of the labor market. The survey descriptive methods were adopted, and the questionnaire was used to collect data. The study found that the requirements of the labor market were largely met in all the four areas. Moreover, the barriers of developing the qualitative external efficiency of university education in the Kingdom as perceived by the faculty members at the faculties of humanities at King Saud University based on the requirements of the labor market were largely met.

Al-Adadi and Al-Abdi's study (2015) investigated the impact of the Fourth Industrial Revolution technologies, including automation, AI, robots, Internet of things, on the Kingdom's labor market, focusing on the skills and jobs that are most liable to replacement. The quantitative analytical method was adopted in this study through a questionnaire administrated to a sample comprised of (341) male and female employees in various sectors. The study concluded that it is essential to expedite the development of national policies to develop the human capital, and adopt flexible training programs to keep pace with digital transformation.

Sa'di's study (2025) shed light on jobs considering the Fourth Industrial Revolution. The researcher adopted the social research method based on sampling and questionnaire, applied on a sample of (30) respondents of specialists and experts at the Ministry of Planning, and the Ministry of Labor and Social Affairs. The researcher concluded my things, including old systems used in the government organizations and failure to transform to a state-of-the-art technology.

Al-Odah's study (2019) identified the role of Saudi universities in meeting the needs of the Saudi labor market. The study adopted the descriptive survey method, which was applied on a stratified random sample comprising faculty members of Saudi universities. The study also adopted a purposive sample comprising all chairmen of chambers of commerce, academic experts and experts of business sector. Major findings of the study were that among the main requirements of the Saudi labor market was possessing

computer and modern technology skills. It was also found that the university in general provides students with many skills, including research, analysis and social media skills.

Al-Rushaydan's study (2023) identified the major requirements at the Saudi higher education organizations to enhance alignment between their outcomes and requirements of the labor market in the private sector, and to promote a framework to strengthen alignment. The study used the descriptive-analytical method for the data collected through personal interview and questionnaire. The study population comprised all leaders of the Saudi higher education organizations, faculty members and various levels of leaders at companies of the Saudi private sector. The major findings were that there were a set of requirements that must be available in the higher education organizations to promote alignment between their outcomes and requirements of the labor market.

Al-Shehri's study (2019) examined the relationship between the Fourth Industrial Revolution and education outcomes at the Saudi universities. The study focused on the level of alignment with the requirements of the labor market, and used the descriptive-analytical method through a questionnaire administrated to the faculty members. The findings showed that (50%) of the respondentsagreed that there is a positive relationship between the education outcomes at the Saudi universities and requirements of the Fourt Industrial Revolution, compared with (30%) of respondents who disagreed, and (20%) who were neutral. The study concluded that there was medium awareness of the significance of adapting with the new requirements of the labor market.

Al-Ateeq and Halawani's study (2024) analyzed the digital transformation impact on the rate of unemployment in the Kingdom of Saudia Arabia during 2000-2021. To analyze the relationships, a multiple linear regression analysis model was described to express the relationship between the rate of unemployment as a dependent variable, and the independent variables relevant to digital transformation. The results showed that there is a disproportionate relationship between the rate of unemployment and the number of independent variables. The study also showed, contrary to expectations, that the number of patents, Internet users, spending on research and development, did not influence unemployment rates in the Kingdom during the study period. The study recommended to develop the infrastructure of the information and communication technology sector, raise the intellectual and knowledge-based human resources efficiency, qualify them to manage and keep pace with the rapid technological development, and encourage investments in the information and communication technology sector, because of its

fundamental role in keeping pace with the digital transformation and development, which has a positive impact on reducing unemployment rate.

Lee and Lim's study (2022) reviewed the experiences of Korean universities in using augmented reality, where the students were trained on dealing with the virtual cases by using 3D technologies, and helped the development of practical and cognitive skills simultaneously.

Abdelrahman (2022) offered a digital training model at Egyptian universities depending on performing digital field projects. The results showed that this experience improved the skills of field research students and provided the appropriate skills.

Comments on related literature:

The present study is consistent with the previous studies regarding the explanation of the significance and relationship of the Fourth Industrial Revolution with the labor markets in various contexts. However, it differs from them in terms of the present study's focus on identifying the status of the use of the Fourth Industrial Revolution technologies by male and female students representing a sample of Saudi universities, one public and another private, which are considered among the requirements of the Saudi labor market.

Research theory:

Research theory is an opportunity for applying the scholars' ideas on the research topic. Therefore, the French sociologist George Friedmann's theory explaining the (amount of negative impact of technological developments on human work) will be taken as a basis for this research. Friedman showed the extent of technological invasion for all fields of work, and its intrusion in all industries to perform work, alongside the disappearance of some traditional works, in addition to its impact on the workers themselves and their career future.

Accordingly, George Friedmann put the social responsibility on employers for the consequences of technology, considering them most able in limiting the negative impacts. He noticed the technological intrusion for all sectors of work, which reduced the workers' level of control over work progress through their skills and replacing them with technological skills. This also eroded the spirit of taking the initiative and creativity. Therefore, Friedmann emphasized the strategic importance of knowing and understanding the society.

Based on the foregoing, Friedmann's vision can be applied on careers considering the Fourth Industrial

Revolution, considering that every work performed by a human being comprises a group of activities that require their use of mind, physical effort and relevant tools to achieve the required results. Therefore, alignment is required to reduce the technological impacts on jobs, a matter that serves all parties.

Methodology:

The present study adopts the descriptive-analytical survey method, which aims at identifying the status of things under study, then describing them. This method is based on data collection for either testing the hypotheses that describe the individuals' status under study, or answer the relevant questions (Adas, 1992). The study depends on the quantitative method through careful and meticulous data collection, then describes and analyzes them to reach the conclusions and implications related to answers of the study questions.

Population and sample:

The study population comprises all undergraduate male and female students at King Saud and Prince Sultan universities. The researcher selected the sample using the cluster random sampling method. To ensure the questionnaire statements are clear, a pilot sample of (30) was administered, then excluded from the total sample later.

Data collection tools:

Study tool:

Following the review of related literature, the researcher prepared a questionnaire distributed in an electronic and paper forms for data collection. Data were coded and entered into the SPSS software. The researcher received (460) electronic and paper questionnaires. The independent variables included the demographic data (i.e., gender, origin of family, father's job, mother's job, family's monthly income in riyals, university, field of study, language of study, hours spent in daily use of the Fourth Industrial Revolution technologies as stated above). The status of using the Fourth Industrial Revolution technologies represented by AI, metaverse and social media, was examined.

Processing statistical data:

After coding the data obtained from the valid questionnaires, the researcher used the Statistical Package for Social Sciences Under Windows-SPSSWIN-V23.

1. Frequencies and percentages to identify the frequency of respondents' responses.
2. Measures of central tendency represented by the weighted average.

3. Standard deviation, one of the most important measures of dispersion. It is used to study how close or wide the data are from each other, i.e., from the arithmetic mean, which is the most accurate and used measure of dispersion. It is defined as the square root of the average squared deviations of values (variance) from their arithmetic mean. The closer the deviation value is from zero, the more the data will be homogeneous.
4. Cronbach's Alpha: It is used to verify the questionnaire reliability.
5. Pearson Correlation Coefficient: It measures the strength and direction of the relationship between two continuous quantitative variables. The relationship is considered weak if the coefficient value is less than (0.3), and medium if the coefficient value ranges between (0.3-0.7), and strong if it is above (0.7).
6. Independent Sample t-test: It is used to examine the statistical significance of the differences between arithmetic means of two groups of respondents for a variable of interval or ratio type. The independent variable is a continuous quantitative variable to show if there are statistically significant differences amongthe respondentsresponses to various aspects of the study.
7. One-Way Analysis of Variance (ANOVA): It is used to examine the statistical significance of differences between arithmetic means for more than two sets of respondents regarding a variable of interval or ratio type. The independent variable is a continuous quantitative variable to show if there are statistically significant differences between answers of respondents on various aspects of the study.

In this study, the statistical significance is limited to p-value (significance) less than (0.05) (p<0.05), corresponding to a confidence level of (95%).The researcher only considered the results at this level of significance.

Therefore, the researcher will use the weighted mean for responses to the questionnaire statements using Likert-scale to know the general directions of the respondents' responses.

For interpreting the study means, the five-point scale presented in Table (1) below is used.

Table (1): Rating Scale According to Five-Point Likert-Scale

Response		Score	Weighted Mean Average	Level
Never	Strongly Disagree	1	1.00–1.79	Low
Rarely	Disagree	2	1.80–2.60	

Sometimes	Neutral	3	2.60–3.39	Moderate
Often	Agree	4	3.40–4.19	High
Always	Strongly Agree	5	4.20–5.00	

For the statements on the five-point Likert-scale, we notice that all arithmetic means that range from (1-2.6) are low, from (2.6-3.4) are medium, and from (3.4-5.0) are high. The range can be calculated by (largest value-lowest value) = 5-1= 4, then calculating the class interval length by dividing the range/the number of proposed classes= 4/5=0.8, then adding the total to the lowest value in the five-point scale, resulting in the form shown above.

The questionnaire analysis undergoes many phases:

1. Testing data normality for study measures:
2. Reliability and validity of questionnaire, to verify the accuracy of questionnaire representation to study population.
3. Descriptive statistics: Descriptive statistics are used to describe and summarize the data. They answer questions related to frequencies and percentages, as well as arithmetic means that form the most important measures of central tendency and standard deviations, which are key measures of dispersion. By describing data, a detailed view can be given on them to obtain a multifaceted view on data whereby we can reach many results.

Testing data normality for study measures:

To verify data normality and that they follow normal distribution, the skewness and kurtosis tests were conducted. The results are presented in the table below:

Table (2): Test of Data Normality for Study Measures

Study Measures	Skewness Coefficient	Kurtosis Coefficient
Status of using artificial intelligence applications	0.36	0.46
Status of using metaverse applications	0.18	0.50
Status of using social networks platforms	0.44	0.80

Based on the findings presented in the table above, it is evident that the skewness value of the study measures fall between (±3), and the kurtosis values fall between (±10). Therefore, the data are normally distributed, whereby the skewness and kurtosis values of the study measures do not exceed the commonly accepted cut-off thresholds. This confirms that the data of the study measures follow the normal distribution, and consequently the parametric tests are used to verify the study hypotheses (Kline, 2023).

Reliability and validity measures:

When a measure achieves the target it is designed to achieve, it is considered valid. Experts agree that the measure (or tool) is valid whenever it achieves its goal and measures what it is supposed to measure.

The questionnaire validity means representing the population under study in a good manner, which means that the responses obtained from the questionnaire questions give the information intended when the questions were put down.

Face Validity:

Face validity reflects the arbitrators' agreement on the validity of the scale or tool for achieving the goal it was designed to achieve. To verify that the questionnaire was valid and representative to the scale themes, the questionnaire, along with the study problem and questions, were presented to a group of professors in social studies to judge their validity for measurement. The researcher took the arbitrators' comments and suggestions, whereby they were used in rephrasing some questions. They questionnaire thereafter became ready for application. The percentage of arbitrators' agreement on the clarity of questions, their order and coverage of the study subject and themes, was high.

Internal Consistency:

It means that each item is linked to the theme it belongs to. The validity of the questionnaire's internal consistency was verified by calculating the Pearson Correlation Coefficient among the scores of each item, and the total score of the theme where the item belongs using SPSS (version 23). The findings showed that all correlation coefficients were all high and significant at a level less than (0.01). The table below shows the correlation coefficients between every item of the first theme and the total score of the theme.

Questionnaire Reliability:

Questionnaire reliability means that if the questionnaire is administered to another sample of the same population and with the same sample size, the results will be approximate to the results obtained from the first sample.

The questionnaire reliability was tested using Cronbach's Alpha that takes values from zero and one. When the value is close to one, it is said that the questionnaire is valid and it represents the population under study. However, when it is close to zero, it is said that the questionnaire does not represent the population. In this case, it is advisable to rephrase the questionnaire questions. The same parameters are also used to calculate the reliability coefficient. The validity coefficient is used through taking the root of the reliability coefficient, which is a correlation coefficient that shows what is applied in this session and thereafter.

Table (3): Cronbach's Alpha

Study Themes	Reliability Coefficient
Status of using artificial intelligence applications	0.81
Status of using metaverse applications	0.94
Status of using social networks platforms	0.65
Total Reliability	**0.93**
Total Validity	**0.96**

Based on the findings presented in the table above, it is evident that the value of general reliability coefficient for the study themes is high, scoring (0.93) for all items of the questionnaire. However, the themes reliability coefficient ranged between (0.65) as minimum for the status of using social media platforms and (0.94) as maximum for the status of using the metaverse applications. This shows that the questionnaire has a high level of reliability that can be depended on for field application of the study according to Nammally scale which adopted (0.7) as minimum for reliability (Nammally & Bemetein, 1994). Hair et al. (2014) pointed out that the minimum for accepting Cronbch's Alpha is (0.7). Accordingly, there was high consistency among the statements that measure the concepts on which the study is based, and that all statements measuring every concept are reliable, and so all study measures enjoy high reliability.

The study general validity (Pearson Correlation Coefficient) was (0.96), calculated by taking the square root of the reliability coefficient of Cronbach's Alpha. However, the themes validity ranged between (0.49) as minimum for the theme concerning the status of using the metaverse application and (0.83) as maximum for the theme concerningthe aspects related to culture, which are significant at a level lower than (0.01). This means that the questionnaire was valid (i.e., it is

representative of the population from which the sample was drawn).

Study findings:

First: Demographic characteristics of the study sample:

Table (4): Statistical Description According to Gender

Gender	Frequency	Percentage
Male	278	60.5
Female	182	39.5
Total	**460**	**100.0**

Based on the findings presented in the table above, it is evident that the total number of male respondents was (278), representing (60.5%) of the study sample. On the other hand, female respondents represented about (39.5%).

Table (5): Statistical Description According to the Variable of Family's Place of Origin

Place of Origin	Frequency	Percentage
Nomad	62	13.4
Village	120	26.0
City	278	60.5
Total	**460**	**100**

Findings of the table above indicate that most respondents, based on the family's place of origin, were from the city, representing (60.5%). They are followed by the village, representing (26%). However, families of nomadic origins came last, representing (13.4%).

Table (6): Statistical Description According to the Variable of Family's Monthly Income (in SR)

Family's Monthly Income (in SR)	Frequency	Percentage
Less than (5) thousands	26	5.6
From (5) thousand to less than (10) thousands	31	6.7
From (10) thousands to less than (15) thousands	64	13.9

From (15) thousands to less than (20) thousands	74	16.1
From (20) thousands and above	265	57.7
Total	**460**	**100**

Findings of the table above indicates that most respondents' families had high monthly income starting from (20) thousands and above, representing (58%) of the study sample. They are followed by respondents' families having income from (15) thousands to less than (20) thousands, representing about (16%). Finally, respondents' families having monthly incomeless than (5) thousands represented about (6%) of the study sample.

Table (7): Statistical Description According to the Variable of University

University	Frequency	Percentage
King Saud University	385	83.7
Prince Sultan University	75	16.3
Total	**460**	**100.0**

Findings of the table above indicate that, based on the variable of university, most respondents were from King Saud University (385), representing (83.7%) of the study sample. On the other hand, respondents from Prince Sultan University, represented about (16%).

Table (8): Statistical Description According to the Variable of University Major

Major	Frequency	Percentage
Natural Sciences	274	59.4
Humanities	186	40.6
Total	**460**	**100.0**

Findings of the table above indicate that most respondents majored in natural sciences, with numbers (274), representing (59%) of the sample. On the other hand, those majoring in humanities represented about (41%).

Table (9): Statistical Description According to the Variable of Study Language

Study Language	Frequency	Percentage
Arabic	112	24.5
Foreign Language	153	33.2
Both	195	42.3
Total	**460**	**100**

Findings of the table above indicate that the study language of most respondents was both Arabic and English, representing (42%) of respondents, followed by respondents whose study language was (English), representing (33%). Finally, respondents whose study language was Arabic only represented about (25%).

Table (10): Statistical Description of Used Technologies According to Gender

Technologies		Gender		Total
		Male	Female	
AI	F	206.0	137.0	343
	%	79.2	52.7	
Metaverse	F	28.0	18.0	46
	%	10.8	6.9	
Social media	F	180.0	114.0	294
	%	69.2	43.8	
All	F	78.0	49.0	127
	%	30.0	18.8	
Total	F	275	182	457

Findings of the table above indicate that males used artificial intelligence by (79%) compared to females who used it by (53%). Males also used social media more than females, with percentages (69%) and (44%), respectively. Finally, males also used metaverse more than females, representing (11%) and (7%), respectively.

Table (11): Statistical Description of Favorite Digital Platforms According to University

Digital Platforms		University		Total
		King Saud	**Prince Sultan**	
AI	F	299	44	343
	%	%78	%59	
Metaverse	F	41	5	46
	%	%11	%7	
Social	F	257	37	294

media	%	%67	%49	
All	F	95	32	127
	%	%25	%43	
Total	F	382	75	457

Findings of the table above indicate that most respondents of the sample from King Saud University used artificial intelligence more than respondents from Prince Sultan University. They were followed by those using social media from King Saud University by (67%), compared with (49%) from Prince Sultan University. Finally, respondents from King Saud University using metaverse were (11%), compared with (7%) from Prince Sultan University.

Findings Analysis and Discussion:

Introduction:

In this section, we analyze the study findings according to the themes through presenting the respondents' responses on the related questions, and discussing them through reading the statistical analysis of values. The researcher used the frequencies and percentages, as well as the arithmetic means and standard deviations. The statements are put in a descending order according to the largest arithmetic mean and lowest standard deviation. A new variable was created using 'Compute' representing the arithmetic means and totals through merging the statements of each theme in one variable to get the general mean and standard deviation for every theme. This new variable is a continuous quantitative variable, and can be used to obtain the differences between the themes and demographic data, or finding some relations between two themes or more. In the following, the findings are presented, interpreted and discussed.

Theme I: Status of Using AI Applications by the Study Sample

Table (12): Statistical Description of Using AI Applications

#	Status of Using Artificial Intelligence		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	**Often**	**Sometimes**	**Rarely**	**Never**			
2	I care for using AI applications to develop my knowledge and skills	F	161	155	97	28	20	3.89	1.09	Often
		%	34.9	33.6	21.0	6.1	4.3			
1	Using AI applications in making scientific research	F	121	157	148	23	12	3.76	0.98	Often
		%	26.2	34.1	32.1	5.0	2.6			
3	I employ AI in summarizing articles and books	F	150	130	120	32	29	3.74	1.17	Often
		%	32.5	28.2	26.0	6.9	6.3			
6	AI applications	F	150	117	114	38	42	3.64	1.26	Often

#	Status of Using Artificial Intelligence		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	Often	Sometimes	Rarely	Never			
	enable me to develop academic skills in research	%	32.5	25.4	24.7	8.2	9.1			
4	I use AI in translation	F	147	106	106	55	47	3.54	1.32	Often
		%	31.9	23.0	23.0	11.9	10.2			
5	I use self-learning through AI-based learning programs	F	127	110	120	60	44	3.47	1.28	Often
		%	27.5	23.9	26.0	13.0	9.5			
General Mean								3.67	0.848	Often

* Arithmetic mean is comprised of (5) ranks

Findings of the table above indicate that all statements scored arithmetic means that ranged between (3.47) and (3.89). All these means fall in the fourth category of the five-point Likert-scale categories ranging between (3.4) and (4.2), which refer to an "often" use rank. Statement (#2) which states, "I care for using AI applications to develop my knowledge and skills" scored an average of (3.89) of first rank, followed by statement (#1), which states, "Using AI applications in making scientific research," with an arithmetic mean of (3.76). However, statement (#3) which states, "I employ AI in summarizing articles and books" came in the third rank with an arithmetic mean of (3.74). Statement (#6) which states, "AI applications enable me to develop academic skills in research" scored an arithmetic mean of (3.64). Statement (#4), which states, "I use self-learning through AI-based learning programs" obtained the last rank with an arithmetic mean of (3.47). The general arithmetic mean of the first theme "status of using AI applications as perceived by study sample" obtained 3.67 out of 5 points. This mean falls in the fourth category of the five-point Likert-scale that ranges between (3.4) and (4.2), which indicates (often), with standard deviation (0.848), which is less than (1). This means that the study sample of the students of King Saud and Prince Sultan universities is homogeneous and agree in viewpoints. In other words, the sample often uses AI applications.

Theme II: Status of Using Metaverse Applications by the Sample

Table (12): Statistical Description of the Status of Using Metaverse Applications

#	Status of Using Metaverse Applications		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	Often	Sometimes	Rarely	Never			
2	I care for enrolling in training courses on using metaverse	F	31	46	82	57	245	2.05	1.31	Rarely
		%	6.7	10.0	17.8	12.4	53.1			
1	I use metaverse applications in attending entertaining activities in 3D rooms	F	38	36	65	56	266	1.97	1.33	Rarely
		%	8.2	7.8	14.1	12.1	57.7			
6	I spend part of my time on electronic games using virtual reality googles	F	32	38	64	50	277	1.91	1.30	Rarely
		%	6.9	8.2	13.9	10.8	60.1			
4	I talk using metaverse	F	32	36	70	43	280	1.91	1.30	Rarely

#	Status of Using Metaverse Applications		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	Often	Sometimes	Rarely	Never			
	technology with (Avatars) from various regions worldwide	%	6.9	7.8	15.2	9.3	60.7			
5	I make use of metaverse applications in virtual simulation lessons in my field of study	F	32	32	71	51	275	1.90	1.28	Rarely
		%	6.9	6.9	15.4	11.1	59.7			
3	I participate in students' virtual activities using metaverse technology	F	27	33	75	54	272	1.89	1.25	Rarely
		%	5.9	7.2	16.3	11.7	59.0			
General Arithmetic Mean								1.94	1.13	Rarely

* Arithmetic mean is comprised of (5) ranks

Findings of the table above indicate that most respondents were not using metaverse applications a lot. All statements obtained weak arithmetic means that ranged between (1.89) and (2.05). All these means fall within rank two of the five-point Likert-scale that ranged between (1.8) and (2.6), indicating usage range (rarely). Statement (#2) which states, "I care for enrolling in training courses on using metaverse" scored an arithmetic mean of (2.05), obtaining the first rank. It is followed by statement (#1), which states, "I use metaverse applications in attending entertaining activities in 3D rooms," scoring an arithmetic mean of (1.97). Statement (#6) which states, "I spend part of my time on electronic games using virtual reality googles," obtained the third rank, scoring an arithmetic mean of (1.91). Statement (#4), which states, "I talk using metaverse technology with (Avatars) from various regions worldwide," scored an arithmetic mean of (1.91). Statement(#5), which states, "I make use of metaverse applications in virtual simulation lessons in my field of study," scored an arithmetic mean of (1.90) and obtained the rank before last. Statement (#3), which states, "I participate in students' virtual activities using metaverse technology," obtained the last rank with an arithmetic mean of (1.94) out 5 points. This arithmetic mean falls within the second category of the five-point Likert-scale categories, ranging between (1.8) and (2.6), indicating (rarely), which means that the study sample rarely uses metaverse applications.

Theme III: Status of Using Social Media Platform by the Study Sample

Table (13): Statistical Description of the Social Media Platforms

#	Status of Social Media Platforms		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	Often	Sometimes	Rarely	Never			
3	I use social media for entertainment	F	285	116	41	12	7	4.43	0.87	Always
		%	61.8	25.2	8.9	2.6	1.5			
4	When not using social media, I get annoyed	F	258	106	58	25	14	4.23	1.06	Always
		%	56.0	23.0	12.6	5.4	3.0			
1	I use social media platforms in establishing social relationships	F	119	115	113	73	41	3.43	1.27	Often
		%	25.8	24.9	24.5	15.8	8.9			

#	Status of Social Media Platforms		Usage Range					Weighted Average	Standard Deviation	Usage Level
			Always	Often	Sometimes	Rarely	Never			
5	I express my opinion on public issues through social media	F	82	60	89	99	131	2.70	1.45	Sometimes
		%	17.8	13.0	19.3	21.5	28.4			
2	I use social media platforms to obtain financial gains	F	59	55	73	83	191	2.37	1.44	Sometimes
		%	12.8	11.9	15.8	18.0	41.4			
General Arithmetic Mean								3.43	0.797	Often

* Arithmetic mean is comprised of (5) ranks

Findings of the table above indicate that statement (#3), which states, "I use social media for entertainment," scored an arithmetic mean of (4.43) and obtained the first rank. It is followed by statement (#4), which states, "When not using social media, I get annoyed." It scored arithmetic mean of (4.23). These arithmetic means fall in the fifth category of the five-point Likert-scale, ranging between (4.2) and (5.0) and indicating usage level (always). Statement (#1), which states, "I use social media platforms in establishing social relationships," obtained the third rank with an arithmetic mean of (3.43). This mean falls within the fourth category of the five-point Likert-scale, ranging between (3.4) and (4.2), and indicating usage level (often). Statement (#5), which states, "I express my opinion on public issues through social media," scored an arithmetic mean of (2.70). Statement (#2), which states, "I use social media platforms to obtain financial gains," obtained the last rank with an arithmetic mean of (2.37). The general arithmetic mean of theme III (i.e. status of using social media platforms as perceived by the study sample) was (3.43) out of (5). This mean falls within the fourth category of the five-point Likert-scale, ranging between (3.4) and (4.2) and indicating usage level of (often), with standard deviation (0.797), which is less than (1). This indicates that the study sample of students from King Saud and Prince Sultan universities are homogeneous and agree on using social media platforms. In other words, the sample "often" uses social media.

Discussion and Conclusions:

Response to Q1: What is the status of using the Fourth Industrial Revolution technologies (artificial intelligence, metaverse, social media) by male and female students of King Saud and Prince Sultan universities?

The findings indicate that all statements related to measuring the status of using artificial intelligence obtained arithmetic means ranging between (3.47) and (3.89). All these means fall within the fourth category of the five-point Likert-scale, ranging between (3.4) and (4.2) and indicating an "often" usage level. Statement (#2), which states, "I care for using AI applications to develop my knowledge and skills," scored an arithmetic mean of (3.89), and obtained the first rank.

It is evident that the study sample did not use a lot the metaverse applications. All statements obtained weak arithmetic means ranging between (1.89) and (2.05). All these means fall within the second category of the five-point Likert-scale, ranging between (1.8) and (2.6) and indicating a "rarely" usage level. Statement (#2), which states, "I care for enrolling in training courses on using metaverse," scored an arithmetic mean of (2.05) and obtained the first rank.

It is evident that the general arithmetic mean of theme III (i.e. status of using social media platforms as perceived by the study sample) obtained (3.43) out of (5), and it falls within the fourth category of the five-point Likert-scale, ranging between (3.4) and (4.2) and indicating "often" usage level. Statement (#3), which states, "I use social media for entertainment," scored an arithmetic mean of (4.43) and obtained the first rank.

As expected, male and female students of King Saud and Prince Sultan universities "often" used the Fourth Industrial Revolution technologies (viz., artificial intelligence and social media). Their use is particularly for developing their knowledge and skills to keep pace with the requirements of the Saudi labor market that seeks to hire highly skilled candidates in technology areas related to the Fourth Industrial Revolution. It is noticed the male and female students, taking into consideration that there is a tendency towards offering training in this field, rarely used the metaverse. Lack of usage by the students to this technology may be attributed to the fact that it is still new in the Kingdom, which maybe widely used in some ministries.

Response to Q2: Are there statistically significant differences in the respondents' perceptions to their use of artificial

intelligence, metaverse and social media attributed to the personal variables (i.e. gender, type of university)?

The results indicate that male students use artificial intelligence by (79%). In other words, their use is more than that of female students whose use is (53%). Regarding social media, the male students' use is (69%), while the females' use is (44%). Finally, the male students using the metaverse scored a percentage of (11%), and female students scored (7%).

Findings of the table above indicate that most respondents from King Saud University used artificial intelligence more than their counterparts in Prince Sultan University. They were followed by the students using social media from King Saud University by (67%), compared with (49%) from Prince Sultan University. Finally, the students from King Saud University using the metaverse scored (11%), compared with (7%) for students from Prince Sultan University.

The difference between respondents of male and female students form King Saud and Prince Sultan universities may be attributed to the many disciplines in which artificial intelligence may be taught. This is in addition to the fact that the students at King Saud University outnumber those at Prince Sultan University, as well as admitting more foreign students at King Saud University, which increases the use of Fourth Industrial Revolution technologies, particularly social media platforms to exchange experiences and knowledge among the students inside and outside the Kingdom.

Recommendations:

According to the findings of the present study, the following recommendations are provided:

- Offering intensive training courses, and integrating materials or parts of courses to focus on the metaverse technology and applications. This is intended to qualify the male and female students in this field, and meet the requirements of the Saudi labor market and achieve job security in the future.
- Providing educational environments at the universities that employ the Fourth Industrial Revolution technologies, including 3D interactive courses.
- The universities are recommended to work on equipping their students with skills related to the Fourth Industrial Revolution technologies, to achieve job security considering the local and international labor market developments.
- Deepening graduates' understanding of the impact of the Fourth Industrial Revolution applications, and establishing rules and ethics of their use, in a manner that

is positively reflected on their academic and practical life.

REFERENCES

[1] Abdelrahman, H. (2022). The impact of digital project-based training on field skills of social work students in Egyptian universities. *Journal of Social Work Education*, 58(1), 55-73.

[2] Adas, A. (1992). Asaleeb Al-Bahth Al-Tarbawi. Al-Urdun, Amman: Dar Al-Furqan Printing, Publishing and Distribution. (Translation: Adas, A. (1992). Methods of Educational Research. Jordan, Amman. *Dar Al-Furqan Printing, Publishing and Distribution).*

[3] Al-Adadi, A, wa Al-Abdi, B. (2025). Ta'theer tanqniyaat Al-Thawrah Al-sinaiyaah Al-Rabi'ah Ala Suq Al-A'mal Wa Maharaat Al-Waza'ef: Adillah Tajribiyyah Min Al-Mamlakah Al-Arabiah Al-Saudiah. Majallat Al-U'lum Al-Tarbawiyyah Wa Al-Dirasat Al-Insaniyyah. Adad (48), (pp. 839-870). (Translation: Al-Adadi A. and Al-Abdi, B. (2025). Impact of the Fourth Industrial Revolution Technologies on the Labor Market and Job Skills: Empirical Evidence from the Kingdom of Saudi Arabia. *Journal of Educational Sciences and Humanities*. Issue (48), (pp. 839-870)).

[4] Al-Amri, S. (2018). Mustawa Al-Suluk Al-Qiyadi Al-Tahweeli Wa A'alaqatihi Bial-Thakaa' Al-A'tifi Lada Mudiri Madaris Al-Ta'leem Al-Aam Bimaktab AL-Tarbiyah Bishamal Madinat Al-Riyadh. Dirasah Maydaniyaah. Ma'had Al-Idarah Al-A'mmah. Issue (1), (pp. 3-44). (Translation: Level of Transformational Leadership Behavior and Relationship with Emotional Intelligence by Principals of Public Education Schools at the Education Office in North Riyadh: A field Study. *Institute of Public Administration*. Issue (1), (pp. 3-44)).

[5] Al-Ateeq, F. and Halawani. A. (2024). Tahlil Athar Al-Tahawwul Al-Raqami Ala Mu'addal Al-Batalah Fi Al-Mamlakah Al-Arabiah Al-Saudiah Khilal Al-Fatrah (2000-2021). Majalat Al-Ulum Al-Iqtisadiah Wa Al-Idariayh Wa Al-Qanuniyah. Issue 2. Pp. (1-17). (Translation: Al-Ateeq, F. and Halawani. A. (2024). Anaylsis of Digital Transformation Impact on the Unemployment Rate in the Kingdom of Saudi Arabia During (2000-2021). *Economic, Administrative and Legal Sciences Journal. Issue* (2), pp. (1-17))

[6] Algarni A. et. Al., (2024). Achieving Governmental Innovation through Artificial Intelligence Adoption, *International Research Journal of Innovations in Engineering and Technology* 8(6).

[7] Al-Odah, A. (1440). Dawr Al-Jamia'at Al-Saudiah Fi TalbiatIhtiajatSuq Al-A'mal "SigahMuqtarahah". RisalatDoctorah. Jami'at Al-Malik Saud. (Translation:

Al-Odah, A. (1440). The Role of Saudi Universities in Meeting the Needs of Labor Markets "Proposed Model." *PhD Dissertation. King Saud University*).

[8] Al-Qara'wi, M. (2022). MutattallbaatSuq Al-A'mal Al-Saudi WaTahaddiyaat Al-Ta'leem Al-A'li Li-TajqeeqRu'yat 2030. Tajribatat Al-YabanUnmouthajan. Majallat Al-Ulum Al-EqtisadiyahWa Al-I'dariyahWa Al-Qanuniyah. 6 (4). (46-73). (Translation: A;-Qar'awi, M. (2022). Requirements of the Saudi Labor Market between Reality and Challenges of Higher Education for Achieving Vision 2030. Experience of Japan as a Model. Economic, *Administrative and Legal Sciences Journal.* Vol 6. (4). (pp. 46-73).

[9] Al-Ruhayli (2021). Ru'yah Mustaqbaliyyah Lidawr Al-Jami'aat Al-Saudiah Fi I'dad Tullabiha Lisuq Al-A'mal. Majallat Jami'at Hafr Al-Batin Li Alu'lum Al-Trabawiyyah Wa Al-Nafsiyyah. (pp. 85-132). (Translation: Al-Ruhayli (2021). Vision of the Role Played by Saudi Universities in Preparing Students for the Labor Market. *Journal of Educational and Psychological Sicences,* Hafr Al-Batin. (pp. 85-132)).

[10] Al-Rushaydan, M. (1444). Ta'ziz Mulaa'mat Mukrajat Al-Ta'leem Al-A'li Li Mutatallabat Suq Al-Amal Fi Al-Qitaa' Al Khas: Taswur Muqtarah. RisalatDoctorah. Jami'at Al-Malik Saud. 19. 484-522. (Translation: Al-Rushaydan, M. (1444). Enhancing Alignment of Higher Education Outcomes with the Labor Market Requirements in the Private Sector: Proposed Model. *PhD Dissertation. King Saud University*, (19), (pp. 484-522)).

[11] Al-Saghir, A. (2024). Taswwur Muqtarah Li Tatweer Al-Kfafa'ah Al-Kharijiyyah Al-Naw'iyyah Li Al-Ta'leem Al-Jami'i Bi Al-Mamlakah Al-Arabiah Al-Saudiah Fi Daw' Mutatallabaat Suq Al-A'mal. Al-Majallah Al-Tarbawiyyah Li Kulliyyat Al-Tarbiyah BiSuhaaj, 126 (pp. 201-255). (Translation: A Proposal for Developing the External QulitativeEfficiency of University Eudcation in the Kingdom of Saudi Arabia Considering the Requirements of Labor Market. *Journal of Education of the Faculty of Education in Suhaj,* (126), (pp. 201-255)).

[12] Al-Shehri, A. (2019). Waqe' Al-Alaqah Bayn Al-Thawrah Al-Sina'yah Al-Rabi'ah Wa Mukhrajat Al-Ta'leem Min Wujhat Nazar A'dha' Al-Tadrees Fi Al-Mua'ssassah Al-Ammah Li Al-Tadreeb Al-Tiqni Wa Al-Mihni Fi Al-Kharj. MajallatKulliat Al-Tarbiah (Asiut) 35 (11), 20. (Translation: Al-Shehri, A. (2019). Status of the Relationship between the Fourth Industrial Revolution and Education Outcomes as Perceived by Faculty Members of the General Authority for Technical and Vocational Training in Al-Kharj. *Journal of Faculy of Education* (Asiut). 35 (11), 20.)

[13] Bordot, F. (2022). Artificial intelligence, robots and unemployment: Evidence from OECD countries. *Journal of Innovation Economics & Management,* (1).

[14] Giddins, A. (2005). Elm Al-Ijtimaa'. Markez Dirasat Al-Wihdah Al-Arabiyyah. Al-Munazzamah Al-Arabiyyah Lialtarjamah. (Translation: Sociology. Arab Unity Studies Center. *Arab Translation Organization*.

[15] Hair, J.F., Black W.C., Babin, B.J., & Anderson, R.E. (2014). Multivariate Data Analysis (Seventh Edition). *USA: Pearson Education Limited.*

[16] Kareem, S. and Ahmad, Y. (2024). Qiyas WaTahleelTa'theerIstikhdam Al-Robotaat Fi Mua'ddalat Al-Batalah: DirasatTajaribDuwalMukhtarah Li Al-Muddah 2000-2023. Al-Majjallah Al-Iraqiyah Li Al-U'luum Al-Iqtisadiah. Adad (83) (pp. 49-70). (Translation: Kareem, S. and Ahmad, Y. (2024). Measuring and Analyzing Impact of Using Robots on Unemployment Rates: Studying Experiences of Selected Countries during 2000-2023. *Iraqi Journal for Sciences*, issue (83) (pp. 49-70)).

[17] Kline, R.B., (2023). Principles and practices of structural equation medaling (*5th ed.). the Guilford presses*.

[18] Malkawi, N. (2016). Executing Knowledge Management 2.0 through Web 2.0-Applied Study at Jordanian Insurance Companies. *Int. J. Bus. Soc. Sci,* 7, 1-13.

[19] Malkawi, N. M., & Halasa, A. (2016). Exploiting electronic social networks in educational process: Study at Universities in Irbid State-Jordan. *Journal of Education & Social Policy*, 3(5), 96-105.

[20] Malkawi, N., Al-Khasawneh, A., & Mohailan, M. (2021). Enhancing business entrepreneurship through open government data. *Management Science Letters*, 11(3), 861-870.

[21] bin Sulaiman Al-Mutlaq, N., & Malkawi, N. M. (2026). The Impact of Artificial Intelligence on the Quality of Strategic Decisions: The Mediating Role of Organizational Data Readiness. *IEEE Access*.

[22] Sa'di, S. (2025). Al-Mihan Fi Zil Al-Thawrah Al-sinaiyaah Al-Rabi'ah: Dirasah Ijtimayyah Maydaniyyah. HawliyyatAdaab Ayn shams. Mujallad 53, Adad (Yanayar-Maris 2025). (Translation: Sa'di, S. (2025). Professions in the Fourth Industrial Revolution: Field Social Study. *Annals of Ayn Shams Arts, vol*. (53), issue (January-March 2025)).

[23] Schwab, K. (2016). The Fourth Industrial Revolution. *World Economic Forum.*

[24] Website of the General Statistics Authority, Saudi Arabia (https://www/stats/gov.sa).

[25] Website of the Office of Gulf Network for Quality Assurance in Higher Education in the GCC (gcc-sg-org)

[26] Zawawi, N. (2022). Susiologia Al-A'mal Al-Naqabi Fi Al-Jaza'er. Mansurat Al-Bader Al-Sate'. (Translation: Zawawi, N. (2022). Sociology of Trade Unions in Al-Geria. *Al-Bader Al-Sate' Publications*).

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