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Educational Outcomes, Job Needs, and the Labor Market in the Era of Artificial Intelligence in the Gulf Countries

Hanan Naser Aladwani[1], Laila Hamad[2] and Dr. Jamal Naser Aladwani[3]

Abstract

In this research, the impact of developments in artificial intelligence on the labor market in developing countries, with a specific focus on Kuwait and the Gulf states, was explored. The study highlighted the opportunities and challenges presented by artificial intelligence technology for the workforce in these coun-tries, along with an overview of issues related to education and training to keep pace with this technological advancement. It was found that artificial intelligence will have a significant impact on jobs, resulting in the loss of some traditional roles while creating new ones. Factors influencing the impact of artificial intel-ligence include its prevalence, the nature of jobs, and the required skills. In this context, the importance of developing educational strategies based on arti-ficial intelligence and enhancing the technological infrastructure to adequately prepare the workforce was emphasized. Despite the challenges posed by this development, developing countries can leverage artificial intelligence technology to achieve sustainable development and improve the labor market. Overall, the effective integration of artificial intelligence into the labor market in the Gulf countries and developing nations, in general, is a crucial challenge that requires thorough preparation and planning to maximize the benefits of this technological advancement while mitigating potential negative effects.

Keywords: *Artificial Intelligence (AI), Technological Infrastructure States, Education and Training, Economic Planning*

1 Introduction

In a world that is rapidly changing and evolving, the artificial intelligence revolution has been unleashed in response to humanity's desire for progress and sophistication. This revolution aims to accomplish large tasks in record time with high efficiency. Artificial intelligence represents one of the latest technologies garnering significant attention worldwide. As a broad field, AI encompasses various technologies, and with the onset of the fourth industrial revolution, societies have shifted to keep pace with this technological development. The rise of AI use in numerous areas has had a significant impact on the job market, enhancing productivity and competitive capabilities [1].

In the State of Kuwait and the broader Gulf region, where technological advance-ment and innovation are pivotal, AI is expected to have a substantial influence on the labor market in the coming years. The future of work, in this context, refers to AI's impact on the availability and demand for human labor. While AI may lead to the loss of certain jobs, it is also likely to create

[1] Department, Kuwaiti Zakat House, Kuwait, Email: j.aladwani83@gmail.com
[2] Transportation ministry, Kuwait, Email: laila.hamadq8@gmail.com
[3] Department, Ministry of Awqaf and Islamic Affairs, Kuwait, *Corresponding author(s). Email(s): dr.h.alnaser@gmail.com

new employment opportunities. The primary concern in this area is the extent to which AI developments can perform tasks at a lower cost, potentially replacing human labor that relies on these tasks for income. This transformation presents both challenges and opportunities for Kuwait and its neighboring Gulf countries, as they navigate the complexities of integrating AI into their economic and labor landscapes [2].

Continuing the discussion, the State of Kuwait and other Gulf countries are at a crucial juncture in adapting to the AI-driven era. The integration of AI in various sectors is not just a matter of technological adoption but also involves rethinking educational outcomes and job needs. The educational systems in Kuwait and the Gulf region must evolve to equip the workforce with the necessary skills and knowledge to thrive in an AI-dominated job market. This involves a shift in curriculum and teaching methods to emphasize STEM education, critical thinking, and digital literacy [2].

Moreover, the labor market in these countries will undergo significant transforma-tions. Traditional roles may diminish or evolve, requiring workers to adapt to new demands. The Gulf countries, with their diverse economies and rapid development, are uniquely positioned to leverage AI in sectors like oil and gas, finance, healthcare, and smart city development. However, this also means a concerted effort is needed to re-skill and up-skill the existing workforce to meet the emerging job requirements [3].

As we delve deeper into the implications of AI in the State of Kuwait and the wider Gulf region, it becomes evident that a strategic approach is essential. The governments and educational institutions across these countries need to work in tandem to develop frameworks that not only address the immediate challenges posed by AI but also capitalize on its potential benefits. This means investing in research and development in AI, fostering innovation ecosystems, and creating policies that encourage the ethical use of AI [3].

The labor market in the Gulf region is poised for a transformation, with AI intro-ducing new dynamics. For instance, sectors such as tourism, logistics, and retail, which play a significant role in the Gulf economies, are likely to experience significant shifts with AI integration. This could lead to a demand for new skill sets, such as AI management, machine learning expertise, and data analysis skills. It's crucial for educational systems in Kuwait and the Gulf countries to anticipate these changes and adapt accordingly [4].

1.1 Origin of Artificial Intelligence (AI) and its Trends

Artificial Intelligence (AI) has a long history that traces its roots back to the earliest days of philosophy and mathematics. Its modern form started to take shape in the last century, with foundational theories contributed by philosophers and mathematicians like Aristotle, Leibniz, and Boole. This laid the groundwork for significant developments in the field, including Turing's pivotal theories on machine learning and the Turing Test. AI officially emerged as a distinct field during a seminal conference, where John McCarthy introduced the term "Artificial Intelligence." This period witnessed initial successes with programs demonstrating capabilities in natural language understanding and reasoning [4].

Despite these advancements, AI went through phases of decreased funding and interest due to inflated expectations. This led to a refocusing on more practical applications in areas such as machine learning, neural networks, and expert systems. The turn of the century marked a major resurgence in AI, propelled by breakthroughs in machine learning and deep learning. Significant achievements like IBM's Watson, Google's AlphaGo, and the development of

sophisticated natural language processing systems have redefined the field. AI's application has expanded to numerous sectors, influencing areas like healthcare, finance, and autonomous driving [4].

Current trends in AI focus on ethical considerations, bias mitigation, its integration in the latest industrial revolution, the development of localized AI processing, the drive for understandable AI, and leveraging AI for ecological sustainability. These trends show AI's transition from theoretical ideas to a technology with profound transformative potential, emphasizing ethical issues, integration with other technologies, and the importance of making AI decisions transparent and comprehensible [5].

Additionally, the impact of AI on the labor market isn't limited to technical skills. There is an increasing emphasis on soft skills such as adaptability, problem-solving, and interpersonal abilities. These skills are essential in a dynamic job market where human insight and creativity are just as important as technical know-how.

Looking ahead, regions like the State of Kuwait and its neighboring countries need to consider the wider societal impacts of the AI revolution. As AI becomes more prevalent, issues like the digital divide, privacy, and ethical concerns gain prominence. It is crucial to ensure that the benefits of AI reach all parts of society, which involves investments in digital infrastructure, promoting digital education, and formulating inclusive policies to prevent the exacerbation of economic and social inequalities [5].

Additionally, the impact of AI on the traditional cultural and social fabric of these countries cannot be overlooked. It is essential to balance technological advancement with the preservation and promotion of cultural values and social norms. The inte-gration of AI should be done in a way that respects and enhances the unique cultural identities of the Gulf region [9].

In terms of policy-making, Kuwait and the Gulf countries need to establish clear regulations and guidelines to manage the development and deployment of AI. This includes addressing concerns related to data privacy, security, and ethical use of AI. Establishing regulatory frameworks that encourage innovation while protecting individual rights and societal values will be a key challenge [5].

The rationale behind selecting this topic lies in addressing a fundamental ques-tion: What is the impact of artificial intelligence technology on the labor market? Will its use have a negative or positive effect? Does AI contribute to increasing job opportunities or does it lead to more unemployment? In other words, is the use of AI technologies a blessing or a curse? The motivation for this research stems from the fact that AI has become an increasingly integral part of our daily lives. We use numerous AI applications every day, ranging from simple internet searches to self-driving cars. Whether browsing on your phone, conducting bank transactions, or visiting a doctor, AI plays a significant role in these activities [6].

1.2 Research Questions

This study's research question is: What is the impact of using AI technology on the labor market? Do AI applications in various sectors lead to the replacement of workers with machines? This is especially pertinent considering that the labor market serves at least two purposes: providing the workforce for productive activities and offering a source of income for workers through wages. Therefore, the future of work involves examining the effects of advanced AI applications on the efficient operation of the labor market, particularly in terms

of workers' ability to earn decent wages. This research issue is emotionally and politically charged due to the economic, social, and cultural roles that employment plays in societies [6].

In the context of the State of Kuwait and the Gulf countries, these questions gain added significance. The region is rapidly integrating AI technologies into its economies, raising concerns about the future of employment and the nature of work. This research aims to explore the implications of AI on the labor market in these countries, considering their unique economic structures, cultural dynamics, and the evolving nature of work in an AI-driven age [7].

This exploration is particularly relevant for Kuwait and the Gulf region due to their unique economic and social landscapes. The oil-rich economies of the Gulf have traditionally relied on a workforce heavily engaged in the energy sector, but AI's emer-gence is prompting a necessary diversification of their economies. This diversification is not just limited to the creation of new industries but also involves rethinking how existing sectors can be transformed through AI [7].

The study will examine how AI can enhance sectors like healthcare, education, finance, and even the oil industry, offering new kinds of jobs and changing the require-ments for existing ones. For instance, in healthcare, AI might bring about roles

centered on data analysis and personalized medicine, while in finance, there might be a shift towards AI-based predictive analysis and automated customer service [8].

Another crucial aspect of this research will focus on how the labor markets in Kuwait and the Gulf countries can adapt to these changes. This includes considering policies for workforce retraining, education reform to include AI and technology-focused curricula, and strategies to attract and retain talent in emerging tech sectors [8].

Moreover, the cultural and social implications of these changes are profound. In a region where societal norms and traditions play a significant role, the integration of AI must be handled sensitively. This research will delve into how AI can be harmonized with the cultural values of these societies and how it can contribute to societal well-being beyond economic growth [9].

This paper is structured to provide a comprehensive understanding of the sub-ject. The Introduction section lays the groundwork, outlining the origins and evolution of AI and setting the stage for the paper's focus. Following this, the Methodology section describes the dual approach of inductive and descriptive methods employed in the study, highlighting how literature review and sector-specific analysis contribute to understanding AI's impact on different job sectors in the Gulf region. A critical part of the paper, Research Challenges on the Impact of Artificial Intelligence on the Labor Market, identifies the key obstacles faced in assessing AI's influence on jobs, particularly in Kuwait and neighboring countries. The paper then offers a detailed Overview of Artificial Intelligence, presenting the historical background, definitions, and differentiations between AI and automation, underlining AI's economic and social implications. The Economic and Social Impact of AI section explores how AI is revolutionizing industries and its societal repercussions, while the AI and the Future of Work section predicts how AI will reshape job markets and skill requirements. In addressing Regulatory and Policy Considerations, the paper focuses on the need for effective gov-ernance in AI's development and application. The section AI as a Tool for Global and Local Challenges discusses AI's potential in solving broader societal issues. Lastly, the Application Areas of Artificial Intelligence section broadens the scope, showing AI's diverse applications across various sectors, thus encapsulating the multifaceted nature of AI's impact on the labor market and society at large.

2 Methodology

In this study, the researcher has employed both inductive and descriptive method-ologies. The inductive approach involves an extensive review of economic literature focusing on artificial intelligence. This includes examining previous studies and data to build a broad understanding of AI's role and impact in various economic contexts. The objective is to gather insights and patterns from existing knowledge and research in the field of AI, especially as it relates to the labor market [10].

The descriptive method, on the other hand, focuses on describing the phenomenon under study, which in this case is the nature of artificial intelligence and its influence on the labor market. This involves a detailed examination of various sectors impacted by AI and analyzing how AI implementation affects job opportunities within these

sectors. The descriptive approach provides a comprehensive overview of AI's current state, its applications, and its implications for the labor market in the State of Kuwait and the Gulf countries [10].

By combining these methodologies, the study aims to provide a thorough under-standing of AI's economic and employment implications in the Gulf region. This dual approach allows for a grounded analysis that is both informed by existing litera-ture and focused on the specific characteristics and impacts of AI in this particular geographical and economic context. The outcome of the study is expected to reveal nuanced insights into how AI is reshaping the labor market and what that means for the future of work in Kuwait and its neighboring countries [11].

The study's methodology also includes a sector-specific analysis to understand the varied impacts of AI across different industries. This is crucial because the State of Kuwait and the Gulf countries have diverse economic sectors, each with unique dynamics and potential for AI integration. For example, the oil and gas sector, which is central to the region's economy, may experience different AI impacts compared to the tourism or finance sectors. Analyzing these sectors individually will provide a clearer picture of how AI is expected to transform jobs and create new employment opportunities in each area [12].

Additionally, the research will involve gathering data through surveys, interviews, and case studies. Surveys and interviews with industry experts, policymakers, and workers in the region will offer valuable firsthand insights into the current state of AI adoption and its perceived impacts on the labor market. Case studies of successful AI implementations in the region can serve as models for understanding best practices and potential challenges [13].

Furthermore, the study will assess the readiness of the labor force in Kuwait and the Gulf countries to adapt to AI-driven changes. This will involve examining cur-rent educational programs and workforce development initiatives aimed at equipping workers with the necessary skills for an AI-influenced job market [13].

By employing these comprehensive methodologies, the study aims to provide actionable recommendations for stakeholders in Kuwait and the Gulf region. These rec-ommendations could include strategies for workforce retraining, educational reforms, policy adjustments, and investments in AI research and development. The ultimate goal is to help these countries not only adapt to the evolving demands of an AI-driven economy but to thrive in it, leveraging AI for sustainable economic growth and societal benefit [14].

3 Research Challenges on the Impact of Artificial Intelligence on the Labor Market

The primary challenge in researching the impact of artificial intelligence on the labor market, particularly in Kuwait and the Gulf countries, lies in the general lack of deep understanding of AI's intricacies and its potential drawbacks [14]. Many stakeholders are still unfamiliar with how AI systems work, their limitations, and the significant effects they can have on the labor market, including the potential reduction in human labor in favor of smart machines. Additionally, the use of AI in economic sectors raises

concerns about individual rights and economic interests, especially regarding the auto-mated handling of personal data, which is susceptible to breaches. This situation calls for government intervention and regulation, but several specific challenges complicate research in this area:

1. Predicting the Future of AI: It's challenging to foresee the future developments of AI and measure their impact on the labor market accurately. AI is a rapidly evolving field, and its trajectory can be unpredictable [15].
2. Identifying Impacted Jobs: Determining which jobs are likely to be affected by AI is difficult. While some roles may be at risk of automation, others may evolve or require new skills [15].
3. Pinpointing New Job Creation: It's also challenging to predict the new types of jobs that AI might generate. As AI transforms industries, it will likely create roles that don't currently exist [16].
4. Designing Effective Government Policies: Developing government policies to address AI's impact on the labor market is complex. Policies must be adaptable and forward-looking to manage the dynamic nature of AI and its influence on employment [16].

These challenges highlight the need for comprehensive and ongoing research in Kuwait and the Gulf region. Such research should focus on understanding AI's evolving nature, anticipating changes in the job market, and developing robust policies that can adapt to future developments. By tackling these challenges, policymakers, educators, and industry leaders can better prepare for the shifting landscape of work in an AI-driven future [16].

Furthermore, addressing these challenges requires a multifaceted approach that involves collaboration between government entities, educational institutions, industry leaders, and the workforce itself [17].

4 Overview of Artificial Intelligence

Since the advent of the internet and the evolution of electronic and information tech-nology at the beginning of the third millennium, various countries and societies have been adapting to what is known as the Fourth Industrial Revolution. This revolution differs fundamentally from its predecessors in intensity, complexity, and scope, intro-ducing a new phenomenon: digital transformation. This transformation has deeply penetrated the infrastructure of nearly all governments, as well as public and private institutions, leading to a convergence of thought and creativity. It has created a global ecosystem allowing different technologies to benefit from and contribute to each other's development. Consequently, governments, institutions, and commercial and industrial companies have found themselves facing an unprecedented challenge in history [17].

Section One: The Nature, History, and Evolution of Artificial Intelligence Artificial Intelligence (AI) is defined in linguistics as the ability to analyze, synthe-

size, distinguish, choose, and adapt to different and varied situations. AI has evolved as a field of modern computer science related to computing, seeking innovative methods

to perform tasks and make inferences that, to some extent, resemble human intelli-gence. Therefore, it deals with creating smart machines capable of thinking, learning from past experiences, and acting independently [18].

AI is recognized as a science in itself, aimed at enabling computers and other machines to acquire intelligence. It allows them to perform tasks previously exclusive to humans, such as thinking, learning, creating, communicating independently, and finding solutions to problems. AI is also defined as the simulation of human intelli-gence in situations that require precise thinking and swift execution through organized technical methods, using computer programs capable of mimicking intelligent human behavior [18].

AI in the modern context goes beyond simple task execution. It interprets external data correctly, learns from it, and uses these lessons to accomplish specific goals and tasks. It includes advanced technologies in fields like satellite communications, 5G net-works, and digital sensors, contributing to the creation of the "Internet of Things" and 3D printing. Thus, AI has reached a level of sophistication where it can mimic human behavior so closely that it's often hard to distinguish whether certain outputs, like narratives, are created by AI or humans. Robots and smart systems are increasingly contributing to the global economy, overshadowing human input in some areas [19].

AI is classified into two types:

1. Weak or Narrow AI: This focuses on a set of specific and narrow tasks, like chess programs. It lacks self-awareness.
2. Strong AI or General AI: Capable of performing most cognitive functions that humans possess.

The foundation of AI rests on two pillars:

1. Advanced programs that mimic the human mind.
2. A vast amount of data used, analyzed, and tracked to reach conclusions or decisions, or to simulate human intelligence.

Advancement in AI applications requires regulatory controls to enhance trust and encourage funding and investment in AI applications. The global AI index is based on 143 criteria across seven pillars: talent, infrastructure, operating environment, research and development, and government and business strategy [19].

After understanding AI, it's crucial to distinguish between two terms often confused: Automation and AI.

1. Automation: A system based on pre-determined programming rules. Machines follow predefined logical sequences.
2. AI: Involves teaching machines to infer on their own, recognizing what to do and what not to do without human programming. They can learn from past actions, store data, and improve future performance.

While few scientists precisely differentiate between AI and automation, most studies consider them interchangeable.

The researcher views AI not just as a means to enhance productivity but as a technology contributing significantly to overcoming local and global challenges. Eco-nomically, AI can be defined as an array of automated systems capable of globally

competing in storing and utilizing accumulated individual and sectoral data. It ana-lyzes this data in a way that mimics or even surpasses human intelligence in speed, accuracy, and efficiency, addressing future crises to increase efficiency, productivity, and economic growth [20].

The study of AI's evolution and impact extends beyond mere technological advancements. It encompasses an exploration of how AI reshapes various aspects of human life, including economic and social paradigms. AI's rapid development signifies not only a technological shift but also a fundamental change in how societies operate, businesses function, and governments strategize [21].

The integration of AI into different sectors is revolutionizing traditional economic models. AI-driven automation and data analytics are transforming industries by enhancing efficiency, reducing costs, and opening new markets. This transition, how-ever, is not without its challenges. It raises questions about workforce displacement, the need for new skills, and the potential widening of the digital divide [22].

On the social front, AI is influencing aspects such as healthcare delivery, education methodologies, and even cultural and creative industries. Its ability to process vast amounts of data is enabling more personalized and efficient services. However, this also raises concerns about privacy, data security, and ethical use of technology [23].

One of the most significant areas of focus is how AI will shape the future of work. This includes identifying which jobs are likely to be automated and what new kinds of employment AI might create. It's crucial to understand how AI can be a tool for augmenting human work, not just replacing it. This aspect of the study will delve into the skills that will be in demand in an AI-driven economy and how educational and training programs need to adapt to prepare the workforce for these changes [24].

Governments and regulatory bodies play a crucial role in the AI landscape. The research will explore the types of policies and regulations needed to ensure a bal-anced and ethical development of AI technologies. This includes laws regarding data protection, standards for AI development and use, and frameworks for international cooperation in AI research and governance [24].

Finally, the study will examine how AI can be leveraged to address both global and local challenges. This includes its use in tackling environmental issues, improving public health systems, and enhancing the quality of life in urban and rural settings. AI's role in driving economic growth and diversification, particularly in the Gulf region, will also be a key area of discussion [25].

4.1 Importance of Artificial Intelligence

The significance of artificial intelligence (AI) in modern society is profound and multi-faceted. It's not coincidental that in the Arabic language, the terms for 'interest' and 'importance' share a linguistic root, highlighting that we usually pay attention to what we deem important. The widespread attention AI receives at all levels is a testament to its significance. The importance of AI and smart machines is an extension of the role machines have played in human life since

the dawn of history. From the Stone Age, humans have continually created machines to facilitate daily tasks, and over time, the relationship between humans and machines has evolved and diversified [25].

The significance of artificial intelligence (AI) in our modern world is both profound and multifaceted, encompassing a range of aspects that have transformed how we inter-act with technology and each other. AI's role is not just in enhancing existing processes but in redefining them, marking a pivotal shift in our technological journey.

At the forefront of AI's contributions is the Preservation of Human Expertise. AI has the unique capability to assimilate and perpetuate human knowledge, effec-tively transferring vast reservoirs of expertise to smart machines. This not only safeguards our collective wisdom but also ensures its evolution and accessibility for future generations.

Another revolutionary aspect of AI is its facilitation of Human Language Interac-tion. This breakthrough has made it possible for people to communicate with machines using natural language, removing the barrier of complex programming languages. This advancement democratizes technology, making it accessible and user-friendly for diverse societal segments, thereby bridging a significant gap between humans and machines [26].

In the field of Healthcare, AI's impact is particularly transformative. It plays a critical role in diagnosing and treating chronic diseases, honing the precision of medications, and enhancing medical imaging techniques such as X-rays and MRIs. Fur-thermore, AI-driven medical robots are redefining surgical procedures. These robots augment the capabilities of surgeons by providing 3D imaging assistance, thus enhanc-ing surgical precision and reducing the likelihood of complications. This collaboration between AI and healthcare professionals marks a new era in medical treatment, where technology complements human skill rather than replacing it [27].

AI's influence extends to Decision Making in Administration, where it introduces a level of autonomy, precision, and objectivity that was previously unattainable. AI systems, with their unbiased algorithms, facilitate more accurate and impar-tial decision-making processes, which is invaluable in administrative and governance contexts.

The Economic and Social Benefits of AI are equally significant. Industrial robots, a product of AI advancements, have greatly improved product quality through their precision. AI enhances the efficiency of institutional activities, streamlining processes such as the processing of job applicants and tax filings. Additionally, it plays a crucial role in reducing raw material waste and production flaws, leading to increased produc-tivity, lowered production costs, and controlled inflation. These benefits are not just confined to the industrial sector; they have the potential to reshape the development models of emerging markets, signaling a shift in global economic dynamics.

In essence, AI is not merely a technological tool; it represents a paradigm shift in the way we harness machine intelligence. It is an enabler that augments human capa-bilities, enhances quality of life, and paves the way for new socio-economic structures. Its significance lies not only in what it can do today but in its potential to shape the future [28].

AI's roots can be traced back to ancient times. In the 16th century, following the invention of the clock, inventors created the first mechanical moving animals, leading to a vast array of mechanical devices. This led to a focus on theoretical topics after violent attacks on these machines in Britain. George Boole's unified theory in logic in 1854, known today as Boolean algebra, laid the groundwork for modern computing [29].

The term ”artificial intelligence” was first used in 1956 at a Dartmouth College conference, marking the beginning of AI as a distinct field of study. Despite initial challenges, significant advancements in AI occurred in the 1990s, including the devel-opment of AI systems capable of simple tasks like playing chess. The emergence of fifth-generation computers brought a surge in AI research, leading to applications in speech recognition, machine translation, and more complex tasks previously thought exclusive to humans [29].

The swift ascent of artificial intelligence (AI) in recent years is due to the convergence of three crucial factors, each significantly contributing to this technological surge.

First, the AI growth landscape has been transformed by the substantial decrease in computing and mobile phone production costs. This reduction has made advanced computing power more accessible, once limited to well-funded entities. Now, smaller entities and individual enthusiasts can explore and innovate in AI, leading to a burst of creativity and application diversity. The affordability of these technologies has not only promoted their broad adoption but has also ignited a creative wave in AI development, as a wider array of individuals engage with these tools [30].

Second, AI's expansion has been greatly propelled by the global increase in internet and mobile phone use. This worldwide connectivity has enabled unprecedented data storage and sharing levels, particularly via cloud computing. The cloud serves as a cornerstone in AI's progression, providing a scalable, accessible, and cost-efficient platform for managing the immense data volumes needed for AI. This ease of access to cloud services has allowed AI to permeate various sectors, transforming service delivery and consumption [30].

Third, the rapid advancement of AI is further driven by the explosive increase in big data. The sheer volume of data has been growing remarkably, supplying the essential fuel for AI systems to learn, adapt, and improve. Big data forms the basis for training AI algorithms, enhancing their accuracy, pattern recognition, and depth of insight. The synergistic relationship between big data and AI is central to expanding AI's capabilities [31].

The application of AI in various fields, including its utilization by NASA to remotely pilot spacecraft, illustrates its groundbreaking potential. The growing economic interest in AI is reflected in the substantial increase in global AI system investments. AI is poised to have a profound societal impact in the current century, creating numerous new jobs while also leading to job displacement in certain areas. Preparing for AI's societal implications is essential to maximize its beneficial effects [32].

4.2 Application Areas of Artificial Intelligence

Artificial Intelligence (AI) is one of the modern sciences birthed and produced by con-temporary technology, gaining immense importance in recent years due to its diverse applications across numerous vital sectors in human societies. AI has caused radical changes in the economy by providing solutions to most current challenges, aiding in achieving sustainable development goals, including clean and affordable energy, climate action, life below water, and others [33].

Artificial Intelligence (AI) has emerged as a transformative force across a multitude of critical domains, extending its reach far beyond the confines of mere technological innovation. Its applications span a diverse range of fields, including military, industrial, and technical sectors, while also making a significant economic impact in healthcare, education, marketing, e-commerce, and various service industries [34].

One of the most groundbreaking applications of AI is in the realm of Autonomous Vehicles and Drones. AI is the driving force behind the development of self-driving cars and unmanned

aerial vehicles (drones), heralding a new era in transportation and aerial surveillance. These advancements not only promise enhanced efficiency and safety but also pave the way for innovative uses in logistics, military operations, and environmental monitoring [34].

In the field of transportation, AI plays a crucial role in Linear Control Systems, particularly in managing intricate networks like railways. The ability of AI to process vast amounts of data in real-time enables more efficient and safe management of these systems, ensuring smoother operations and enhanced passenger safety [61].

AI's significance is also pronounced in managing Nuclear Reactor Applications. Here, it encompasses a broad spectrum of tasks, including the management of nuclear reactors, extending and repairing underground cable systems, mine detection, and streamlining processes in automobile manufacturing. These applications underscore AI's capability to handle complex, high-stakes environments with precision and reliability[35].

Perhaps one of AI's most vital contributions is its ability to perform Hazardous Tasks that pose risks to human safety. For instance, inspection robots equipped with remote gas sensing technology can operate in dangerous or inaccessible areas, miti-gating the risk to human life. This application of AI in ensuring safety in perilous environments is invaluable [35].

In the industrial sector, AI-enabled Smart Devices play a critical role in inspecting designs, monitoring operations, and making informed decisions. These devices enhance efficiency and accuracy, ensuring optimal performance across various industrial processes [36].

In the economic sphere, AI has revolutionized Data Analysis and Stock Trading Systems. Financial institutions and knowledge sectors leverage AI's prowess in orga-nizing and managing vast datasets, enhancing the accuracy of economic forecasts and stock market analyses.

Voice and Visual Recognition technologies represent another pinnacle of AI appli-cations. The goal here is to enable computers to classify and recognize images and sounds without pre-stored data, pushing the boundaries of machine learning and data processing [37].

Cognitive Simulation, encompassing facial and voice recognition, handwriting anal-ysis, image processing, and data extraction, further illustrates AI's versatility. This application extends AI's capabilities to mimic and understand human cognitive func-tions, offering profound implications in security, personal identification, and user interaction [37].

AI's history dates back to ancient times, with significant advancements in the 20th century. In 1999, NASA entrusted an AI system to pilot a spacecraft, marking a significant milestone. The rapid growth of AI technology in recent years is attributed to factors such as decreased costs of computing and mobile phones, widespread internet and mobile phone use, and the advent of big data. This growth has led to a surge in global spending on AI, predicting that AI will create millions of new jobs while also potentially leading to job losses in some sectors. Preparing for AI's potential societal impacts is essential to ensure its positive influence [38].

4.3 Advantages and Problems of Artificial Intelligence

Artificial Intelligence (AI) possesses numerous characteristics that make it significantly important in the evolution of societies. While AI offers many advantages to both developed and developing economies, it also presents certain challenges that emerge with the use of its applications. This section will overview both the advantages of AI and the potential problems associated with its implementation:

Artificial Intelligence (AI) has brought a myriad of advantages across various sectors, reshaping the industrial landscape and influencing consumer interactions profoundly.

In the realm of Industrial Cost Savings, AI, particularly in labor-intensive and high-cost industries prevalent in Western countries, has been a game-changer. The introduction of automation and production robots, for example, in the German auto-motive industry, has led to a drastic reduction in operational costs. Human labor, costing over 40 euros per hour, is significantly more expensive compared to the 5 to 8 euros per hour required for operating smart robots. These robots offer uninterrupted service without the need for breaks, are immune to fatigue, and are not subject to fac-tors like illness, childbearing, strikes, or annual leaves. This disparity in operational efficiency and cost-effectiveness highlights AI's transformative impact in reducing labor costs and enhancing productivity [38].

Speaking of Increased Productivity, AI applications in both manufacturing and service industries have dramatically boosted company output. Robots and AI systems streamline operational processes, thereby reducing time, effort, waste of raw materials, and production flaws. This optimization leads to a more efficient production line, ultimately benefiting the economy and consumers [39].

In the field of Consumer Behavior Analysis, AI has revolutionized marketing strategies. By understanding and predicting consumer purchasing behavior, AI-driven models offer invaluable insights into current and future consumer desires. High-value customer data, stored and analyzed in the cloud, enables companies to swiftly adapt to changing consumer demands and preferences. This adaptability enhances marketing operations, making them more responsive and targeted [39].

Table 1 Advantages of Artificial Intelligence.

Advantage	Description	Examples	Future Potential
Efficiency and Speed	AI processes data much faster than humans, improving efficiency in tasks.	Automated customer service, fast research data analysis.	Increased automation across all industries and services.
Accuracy and Reliability	AI minimizes human error, offering high accuracy in complex tasks.	Medical diagnostics, financial fraud detection.	Enhanced precision in critical operations like surgery and disaster response.
24/7 Availability	AI operates continuously, providing constant service and monitoring.	Healthcare monitoring, customer support chatbots.	Expanded use in critical infrastructure and emergency services.
Complex Task Handling	AI manages and analyzes complex systems and patterns.	Climate modeling, stock market predictions.	Breakthroughs in global challenges like healthcare and environmental management.
Enhancing Human	AI augments human	Creative arts assistance, complex	Greater human-AI collaboration in creative

Advantage	Description	Examples	Future Potential
Capabilities	skills in creativity and problem-solving.	problem-solving in engineering.	industries and scientific research.
Personalization	AI tailors experiences to individual preferences and needs.	Personalized marketing, adaptive learning environments.	More nuanced and adaptive interfaces and services.
Scalability	AI can be scaled to meet growing demands across various sectors.	Cloud AI services, scalable infrastructure management.	Wider adoption and adaptation in diverse fields globally.
Global Reach	AI transcends geographical limitations, facilitating worldwide access and collaboration.	Online education, international scientific research collaboration.	Enhanced global connectivity and resource sharing.

AI also plays a pivotal role in the Elimination of Repetitive and Routine Tasks. By efficiently handling and responding to changes in assigned activities, AI systems negate the need for repetitive manual labor. This not only increases efficiency but also allows human workers to focus on more creative and complex tasks, where human ingenuity is irreplaceable. the Reduction of Poverty through AI is a significant yet often overlooked advantage. AI supports growth in critical sectors like agriculture and fishing, which are essential for food production. By enhancing the efficiency and productivity in these sectors, AI contributes to poverty alleviation, especially in developing countries where these industries are vital to the economy and sustenance [40].

5 The Impact of Artificial Intelligence on the Labor Market

The economic aspect of artificial intelligence (AI) has gained increasing importance among experts and policymakers due to its significant role in understanding the factors influencing societal wealth. Comprehending the economic effects of AI will enhance

Table 2: Problems of Artificial Intelligence.

Problem	Description	Examples	Future Concerns
Job Displacement	AI may replace human roles, affecting employment in various sectors.	Automated factories, self-checkout kiosks.	Widespread unemployment and the need for societal adaptation to new job markets.
Ethical and Moral Issues	AI decision-making raises concerns about accountability and implications.	Autonomous weapons, AI in judiciary decisions.	Intensified ethical debates and need for robust governance frameworks.
Bias in AI	AI can inherit biases from training data, leading to unfair outcomes.	Biased recruitment tools, discriminatory AI algorithms.	Deepened social inequalities and mistrust in AI systems.
High Costs	Developing and maintaining AI systems	Costs of AI research, infrastructure for deep	Economic disparities between AI-advanced

Problem	Description	Examples	Future Concerns
	requires significant investment.	learning.	and under-resourced communities.
Security Risks	AI is vulnerable to hacking and misuse, posing threats to data security.	AI-driven cyber attacks, malicious use of deepfakes.	Increased sophistication and frequency of AI-related security incidents.
Dependence on Technology	Overreliance on AI reduces human skills and autonomy.	Dependence on AI for navigation, automated decision-making.	Erosion of human capabilities and crisis management skills.
Environmental Impact	AI's resource consumption and waste contribute to environmental concerns.	Energy use in data centers, disposal of AI hardware.	Escalating environmental footprint of technology sectors.
Regulatory and Legal Challenges	The rapid development of AI outpaces legal and regulatory frameworks.	Unclear liability in AI accidents, cross-border data governance.	Increased legal complexities and international disputes over AI control and use.

balanced insights, establishing a foundation to maximize its positive outcomes and minimize negative impacts. Klaus Schwab, in his book "The Fourth Industrial Rev-olution," categorizes the perspectives on the impact of emerging technology on the labor market into two camps: those who believe technology will usher in a new era of massive collective prosperity, and those who foresee chaos and destruction driven by mass unemployment[41].

The dynamic process of technological evolution within the framework of the Indus-trial Revolution involves both the creation and elimination of jobs, leading to a net increase in skilled labor employment and a net loss in unskilled labor due to the automation of numerous jobs. Employment trends will be governed by the directions of the Fourth Industrial Revolution and based on the knowledge economy. Sectors like technology production, service sectors utilizing technologies (especially finance, insur-ance, real estate), professional and personal services, and entertainment will see rapid employment growth. In contrast, employment rates in extraction industries, agricul-ture, manufacturing, and utilities, especially traditional jobs and roles, are expected to decline [41].

Currently, there are growing concerns about the impact of AI applications on the labor market, particularly regarding unemployment rates. These fears are not unfounded, as global spending on AI development is continuously increasing.

AI can be categorized into two types: substitutive and complementary. Examples of the former include autonomous vehicles, while the latter, such as IBM's Watson, assist humans in improving work efficiency. Watson, for instance, encompasses 300 medical journals and numerous clinical guidelines, aiding doctors in disease diagnosis [42].

Study Objectives

This chapter aims to explore the significant economic dimensions of AI by exam-ining its impact on different economic sectors and the potential economic gains from expanding AI

technologies in the macroeconomy. The research also addresses the potential challenges of these transformations, especially at the labor market level. It raises questions about the jobs likely to be affected by AI, the new jobs it might create, and the nature of government policies that could help mitigate AI's negative impacts on the labor market [43].

The expansion of AI technology is expected to bring substantial economic gains. In sectors where AI and automation can perform tasks more efficiently than humans, there can be significant cost reductions and productivity increases. For instance, in manufacturing, the use of robots can lead to streamlined operations and reduced waste, contributing to overall economic growth [44].

Moreover, AI is not solely about replacing human labor; it also creates new job opportunities. The emergence of AI has led to the need for new skill sets, such as AI programming, data analysis, and machine learning expertise. These roles are crucial for the development and maintenance of AI systems. Additionally, AI's contribution to fields like healthcare, through enhanced diagnostic tools and personalized treatment plans, can lead to job creation in these sectors [45].

However, the introduction of AI in the labor market is not without its challenges. One of the primary concerns is the potential for widespread job displacement, espe-cially in sectors highly susceptible to automation. Unskilled or routine jobs are at the highest risk of being automated, leading to increased unemployment rates in these areas [45].

The challenge extends to the need for reskilling and upskilling the current work-force. As AI changes the nature of work, there is a pressing need for current employees to learn new skills to remain employable in an AI-driven economy. This reskilling challenge is significant, requiring substantial investment in education and training programs [46].

Table 3 Economic Benefits and Job Creation of AI.

Aspect	**Description**	**Examples**	**Potential Developments**
Cost Reduction & Productivity	AI and automation can significantly reduce costs and increase efficiency in various sectors.	Automated manufacturing lines, AI-driven logistics.	Further cost savings and productivity enhancements across industries.
Job Creation	AI creates new job opportunities requiring new skill sets.	AI programming, data analysis, machine learning expertise.	Expanding employment in tech sectors and AI-driven industries.
Innovation & Services	AI contributes to the development of new products and services.	Enhanced diagnostic tools in healthcare, personalized learning platforms.	Growth in creative, technical, and service-oriented jobs.
Economic Growth	AI's efficiency can contribute to overall economic expansion.	Increased output in AI-integrated industries like finance and retail.	Wider economic benefits through increased productivity and innovation.
Global Competitiveness	AI adoption can improve a nation's or sector's competitiveness.	Nations leading in AI research and application.	Enhanced global positioning in trade, technology, and innovation.

Table 4. Economic Benefits and Job Creation of AI

To mitigate the potential negative impacts of AI on the labor market, effective government policies and interventions are essential. These may include investing in education and training programs, providing support for those displaced by automation, and encouraging the development of new industries where AI can create more jobs [47].

Moreover, policies should be in place to ensure that the benefits of AI are equi-tably distributed. This includes addressing issues such as income inequality that may be exacerbated by AI and ensuring that all segments of society have access to the opportunities created by AI advancements [48].

the impact of AI on the labor market is multifaceted, with both positive and negative aspects. While AI presents significant opportunities for economic growth and job creation, it also poses challenges in terms of potential job displacement and the need for workforce reskilling. A balanced approach involving proactive government policies, investment in human capital, and collaboration between various stakeholders is crucial to harness the benefits of AI while minimizing its adverse effects on the labor market. The future of work in an AI-driven world requires adaptability, continuous learning, and an inclusive approach to ensure that all members of society can benefit from the technological advancements AI brings [48].

5.1 Identifying Jobs Likely to be affected by Artificial Intelligence

The advancement of artificial intelligence (AI) technology will create new efficiencies and demands. However, it also poses a risk of replacing certain jobs, as numerous

Table 5 Challenges and Disruptions of AI.

Aspect	Description	Examples	Mitigation Strategies
Job Displacement	Routine or unskilled jobs are at high risk of automation.	Automated toll booths, self-checkout kiosks in retail.	Reskilling programs, social safety nets.
Reskilling Challenge	Workers need new skills to remain employable in an AI-driven market.	Ongoing training in AI, data science, and related fields.	Investment in education and vocational training.
Income Inequality	AI might exacerbate income gaps between skilled and unskilled workers.	Wage gaps between tech-savvy and traditional sectors.	Progressive policies, equitable education access.
Economic Disruption	Rapid AI adoption can lead to significant shifts in the economy.	Shifts in demand for certain jobs, impact on sectors like transportation and manufacturing.	Adaptive economic policies, support for transitioning industries.
Ethical and Social Impact	AI's decisions might lack transparency or fairness, affecting social dynamics.	Biased AI in hiring or law enforcement.	Ethical guidelines, transparent AI design.
Global Divide	A divide between AI-advanced and lagging regions could widen.	Disparities in AI benefits between developed and developing nations.	International cooperation, technology sharing agreements.

Table 6 Challenges and Disruptions of AI.high-level studies have predicted significant job losses due to increasing automation in advanced economies [49].

Also, a significant portion of jobs are likely to undergo considerable changes due to automated technologies. There is a notable debate among economists about the extent of jobs likely to be impacted by AI-driven automation. Some studies suggest that the expansion of AI applications could lead to substantial shifts in labor markets, with rapid technological advancements and the proliferation of robots and smart production technologies potentially causing a notable decrease in demand for unskilled labor. This could result in the loss of a large number of traditional, low-skill jobs in the near future across various industries in major economies, while simultaneously creating a substantial number of new jobs [49].

Additionally, the changes caused by recent technological advancements, particularly due to the growth of AI, might make half of the current skills outdated in the next five years. AI is predicted to greatly influence the patterns of labor demand, especially in jobs that are repetitive and require low skills. These positions are expected to move towards more cognitive, high-skill jobs that are less likely to be automated. As a result, the proportion of low-skill labor in the overall workforce is likely to decrease significantly by 2030, while the percentage of high-skill technical jobs is anticipated to increase notably [50].

As we advance into the future, the impact of Artificial Intelligence (AI) on the job market is expected to be substantial, with several professions undergoing significant transformations.

In the field of Data Entry, AI is poised to revolutionize the way we handle informa-tion. AI devices are capable of performing data entry tasks with a speed and accuracy that far surpass human capabilities. This enhancement in efficiency could lead to a shift in the role of human data entry clerks, redirecting their skills to more analytical and interpretative tasks [51].

Customer Service is another area where AI is making inroads. With the advent of chatbots and voice assistants, routine customer service inquiries can be handled efficiently without the need for direct human interaction. This technology not only streamlines the process but also ensures 24/7 service availability, enhancing customer satisfaction. However, this may lead to a reevaluation of the role of human cus-tomer service representatives, focusing them more on complex and nuanced customer interactions [51].

In manufacturing, particularly on Assembly Lines, robots equipped with AI are increasingly being employed to perform repetitive tasks. Their capability to work faster and more consistently than humans can lead to higher productivity and quality control in manufacturing processes [52].

The domains of Bookkeeping and Record Keeping are also undergoing a trans-formation due to AI. AI applications have shown greater efficiency and accuracy in managing financial and administrative records, which could redefine the roles of pro-fessionals in this sector, steering them towards more strategic financial planning and analysis [53].

The Transportation and Logistics sectors are on the cusp of a major overhaul with the development of autonomous vehicles and delivery drones. This technological leap could replace some jobs in these sectors, impacting a wide array of professions including office and administrative support workers, drivers, security guards, sales assistants, account managers, administrative secretaries, financial auditors, warehouse managers, customer service workers, cleaners, bank tellers, and call center operators [53].

In the Agricultural sector, AI's role is growing, with automated machines increas-ingly used to monitor and manage crops. These systems can predict optimal planting and harvesting times, adjust pesticide applications, and enhance overall farm efficiency. This advancement in

agricultural technology could lead to a shift in the workforce, potentially replacing some traditional agricultural jobs [54].

These transformations signify a shift in the job market, where AI's growing presence may reduce the need for certain jobs while simultaneously creating new opportunities in areas that require human intuition, creativity, and complex decision-making. As such, the future workforce may need to adapt and acquire new skills to thrive in an AI-integrated job market [55].

The researcher emphasizes the importance of acknowledging that Artificial Intel-ligence (AI) is still in the nascent stages of its development, and its future impact on the labor market remains somewhat uncertain. However, it is highly probable that AI will continue to become more integrated into our daily lives, leading to substan-tial alterations in the job market. These modifications are expected to predominantly

involve shifts in the nature of work, particularly concerning labor intensity and the extent of automation, rather than leading to the outright elimination of jobs [56].

Therefore, it is crucial for companies to retrain their existing workforce and attract those with high skills. Introducing AI and digitalization concepts early in the lives of young people and keeping pace with rapid developments is essential to effectively align university and institute graduates with labor market needs. The net impact of these technological advancements on jobs, both short and long-term, is still unclear, especially regarding job replacement and enhancement. However, there is a clear trend towards an increase in technology knowledge jobs and more jobs requiring digital knowledge. The Kuwaitis workforce has demonstrated adaptability to these changes, as seen in the example of adults with only a preparatory education successfully using smart applications like Uber on their smartphones [57].

5.2 Identifying New Jobs Likely to be created by Artificial Intelligence

One of the latest technological innovations thanks to artificial intelligence is Microsoft's ChatGPT, developed by OpenAI. This program has gained widespread admiration for its ability to answer questions, write articles, and even discuss legal issues, sparking curiosity among people and researchers about how AI technologies might affect their jobs and professions. There's a growing concern about AI technology taking over human jobs. However, the more pertinent question is: Will AI technologies replace jobs or create new ones? The short answer to whether AI will replace some jobs is "yes," but it will also create new jobs that align with these technologies[58].

The rapid developments in AI mean that technology can achieve more and more, undoubtedly affecting jobs. As physical machines and automated systems become more capable due to AI, it's economically feasible to replace a significant portion of human labor with machines. However, previous experiences during past industrial revolutions have shown that these technological changes don't necessarily lead to large increases in unemployment rates. Instead, they cause a shift in the labor market by moving market demand from one area to another [59].

The emergence of AI and automation doesn't mean the end of jobs but rather a transformation in the job market. It involves a shift in the types of jobs available, often moving towards higher complexity and requiring a different set of skills. This evolution in the job market necessitates a shift in workforce training and education, focusing on the skills required for the new jobs created by AI advancements. As technology evolves, the workforce needs to adapt, acquiring new skills and capabilities to stay relevant in a rapidly changing job landscape. This adaptation not only preserves employment but also opens up opportunities for more meaningful and less repetitive work [60].

Experts believe that certain jobs are more susceptible to replacement by automa-tion. There's a broad consensus that modern artificial intelligence technology is most suited for routine tasks or jobs that are highly repetitive or based on very specific instructions or rules. This development in technology has begun to threaten both blue-collar and white-collar jobs, prompting some to emphasize the disruptive impact of AI, making the fourth industrial revolution distinctly different from previous ones. For instance, AI can now conduct banking transactions, manage customer accounts, and even provide financial advice. Additionally, chatbots can now respond to customer inquiries and offer support [61].

Rather than completely replacing jobs, AI contributes to reorganizing and redis-tributing tasks within professions. A 2016 study by France Strat´egie suggests that the use of robots will increase the need for social skills to achieve integration between humans and machines. Many experts agree that this scenario is the most logical in the near future. Therefore, AI systems will inevitably require experienced individuals to operate and maintain them, as well as to transfer and benefit from their technology. The primary beneficiary of this technology will be those who recognize its positive aspects, not only in terms of productivity and efficiency but also in terms of equipping employees with skills and abilities compatible with this technology [62].

Historically, industrial revolutions have led to more job creation than job losses. AI is likely to create new jobs in fields such as IT and logistics, including the logistics services sector, which involves the flow of goods, energy, information, and storage from production areas to consumption areas. This sector is one of the most attractive for local and foreign investment and a means of diversifying the economy in any country [63].

Some prominent robotics researchers maintain that there's no historical proof that modern technology results in job losses. In fact, industries that adopt the most efficient production technologies often experience growth, success, and an increase in their workforce. This growth is attributed to their expanding markets and the introduction of new production lines. A notable instance of this is India's experience in the early 1990s, which capitalized on the information revolution. India established numerous colleges and universities that produced millions of computer science specialists. Consequently, a significant portion of American IT technology came to rely on Indian human resources, with a considerable number of Indians employed in the IT sector. This example demonstrates how embracing technology can lead to job creation and economic growth [64].

A study encompassing numerous nations indicates that employing AI in production is expected to boost labor demand in fields related to technology production, engineering, mathematics, science, logical analysis, and creative thinking. It is projected that a significant number of new jobs will emerge in enterprises of various sizes across different economic sectors soon. In the coming years, a substantial portion of traditional jobs is anticipated to vanish as a result of progress in AI, nanotechnology, big data analysis, and similar fields. Concurrently, new jobs and opportunities are likely to arise, focusing on informatics, creativity, and innovation [65].

However, jobs requiring social intelligence or involving creativity, design, and sys-temic thinking will still primarily involve human participation. Therefore, it's unlikely that AI technology will replace them. Even in worst-case scenarios, where machines become as intelligent as humans, integration between humans and machines is more probable than replacement. Consequently, it's improbable that technology will monop-olize jobs with a strong human element, such as doctors, therapists, lawyers, teachers,

healthcare workers, and personal services. Jobs requiring creative or social skills can-not be easily replicated by AI. Therefore, humans are likely to remain in demand for jobs like teaching,

healthcare, and personal services, among others that depend on personal skills like artists, actors, writers, and media professionals. In conclusion, AI will likely make remaining jobs more human, as ironically, the advancements in AI will enable humans to focus more on caregiving, customer interaction, and providing positive experiences [65].

Despite the concerns about AI replacing jobs, the researcher believes that AI's impact on the job market could be positive, offering new opportunities associated with technological changes in areas like machine learning, data analysis, robotics, and specialists in these fields such as data scientists, robotic engineers, or individuals involved in designing and manufacturing sensors for autonomous vehicles and drones. These fields require specialized knowledge and skills. Additionally, AI can enhance human capabilities in various sectors like industry, agriculture, healthcare, education, and logistics, creating new roles and job opportunities [66].

However, the researcher notes that the trend towards automation and the use of robots might limit human capabilities' employment, which may not be suitable for developing countries like Kuwait. The key is to select applications appropriate for the overall condition of the developing country. AI can create new job opportuni-ties in fields like IT and logistics, which include managing the flow of goods, energy, information, and other resources from production to consumption areas. Sectors like healthcare, industry, and transport can also benefit from improved efficiency and reduced costs [66].

It's important to note that the best-performing companies and countries in the AI era are those that adopt these changes quickly and effectively. New jobs and eco-nomic growth will come to those who embrace technology, not those who resist or delay its adoption. To achieve a developmental leap through AI applications, certain conditions must be available in developing countries, which are not sufficiently present yet. These conditions involve initiatives from developing countries and assistance from international institutions focused on inducing developmental leaps in poorer economies [67].

As AI usage spreads across all sectors, another negative problem emerges: the issue of inequality in income and wealth distribution among countries and individuals. This aspect will be addressed in the following sections.

The advent of AI and related technologies has brought us to the brink of a sec-ond Industrial Age. This era is marked by a rapid increase in AI applications, such as autonomous delivery vehicles, remote teaching, scheduling software, computers replac-ing legal assistants, and self-driving cars. These applications mimic human tasks and signify a technological leap [68].

Economists warn that this surge in AI technology could lead to greater income disparity. They expect that AI technologies will widen the digital divide and income inequality between developed and developing countries. Most of the financial bene-fits from AI are projected to accrue to major technology producers like the United States and China, due to their high investment levels in developing and adopting

these technologies. Developing countries, burdened by public debt, high unemploy-ment rates, low wages, and poor human capital, might find it challenging to invest in such technologies [69].

The debate over the relationship between technological growth and income dis-tribution dates back to the early 19th century. Optimists believe that technological advancement leads to increased productivity and, consequently, a higher per capita income, improving individuals' living standards. However, economist Simon Kuznets argued that income and wealth inequality

would initially increase in the early stages of economic growth, then stabilize and begin to improve [69].

On the other hand, pessimists argue that despite increasing productivity, tech-nological progress poses a threat to the income of a large segment of workers. The expansion of modern technology in production processes could exacerbate unemploy-ment and widen the gap between the rich and the poor, transforming it into a digital divide. This is due to the redistribution of income in favor of those who can access knowledge and information technology [70].

Some groups will benefit more than others from modern technology, leading to increased income and wealth disparities. For instance, engineers and data experts are likely to benefit more from AI than workers performing simple tasks. A recent Brookings Institution report concluded that despite economic growth driven by AI-based automation, workers' share of profits has diminished compared to capital owners. Workers now receive a smaller portion of the revenues from economic growth and increased national productivity [71].

This situation has led to a labor market progressively less able to maintain workers' living standards. Research suggests that the diminishing demand for low-skilled labor will cause its proportion of the total global income to decline significantly in the coming years. As a result, companies are likely to engage in competition to recruit individuals possessing advanced technical skills. Both historical and current studies demonstrate that changes in work and professions, driven by technology, tend to impact lower-paid or less skilled workers more severely. [72].

This unequal distribution of automation benefits could lead to severe societal insta-bility worldwide. The risks of automation extend beyond income and wealth inequality among individuals to include personal characteristics such as age, education, and gen-der. Studies show that younger workers (ages 20-29) are less likely to be replaced, as they are generally more adept at using new technologies and less fearful of job loss due to automation. They are also more capable of adapting to new technologies and "upskilling" digitally [73].

In contrast, older workers, closer to retirement, are more at risk of replacement unless they acquire new skills. Educated individuals are less fearful of losing their jobs to automation, as education generally equips them with the knowledge and skills to perform their jobs well and compete in the job market. The impact of automation on gender is less clear. While women are more likely to earn university degrees and often work in non-routine jobs that are harder to automate, some studies suggest that women might be more affected than men. This is due to women's significant presence in office work, particularly in higher and middle-income countries, and their overrepresentation in part-time jobs, particularly in the service sector [74].

Some of the new job types likely to be created by AI include:

1. AI Engineers: The world will need more engineers to design and develop AI systems.
2. Data Scientists: This role involves organizing vast amounts of data used by AI.
3. User Experience Designers: Designers capable of creating engaging and user-friendly experiences for AI systems.
4. Technical Roles: Programmers, computer programmers, software engineers, data analysts, AI specialists, technology developers, and digital transformation special-ists.

Kuwait and the Gulf countries have been actively investing in smart technology and AI, recognizing their potential to drive economic growth and innovation. These investments have

placed these nations at the forefront of digital transformation in the region. The AI sector in Kuwait and the Gulf is poised for substantial growth in the coming years, with governments focusing on digital models to enhance various aspects of life and governmental performance [75].

The transformation in Kuwait and the Gulf countries reflects a strategic vision to build a digital economy, improving the quality of life and government services. This shift is expected to contribute significantly to the GDP, with a particular emphasis on AI. National councils and ministries dedicated to AI and technology are being established to regulate and promote this sector.

However, the researcher notes that the current state of AI in these regions, much like in Kuwait, primarily revolves around data prediction rather than the creation of new knowledge. There's a significant emphasis on using AI to synthesize existing knowledge for specific goals [76].

The future job market in Kuwait and the Gulf countries is expected to see a trans-formation due to AI. While AI might displace some traditional jobs, it is also likely to create new opportunities in fields such as machine learning, data analysis, robotics, and other specialized sectors like data science and AI engineering. The challenge lies in ensuring that the workforce is equipped with the necessary skills and knowledge to adapt to these new roles [77].

The researcher stresses the importance of continuous education and skill develop-ment to match the rapid technological changes. This approach aligns with the Islamic emphasis on lifelong learning, highlighting the need for ongoing education to stay relevant in a rapidly evolving job market [77].

6 Artificial Intelligence (AI) and the Job Market

In light of the growing influence of artificial intelligence (AI) on the job market, there is a pressing need for effective governmental policies to mitigate its potential adverse effects. As AI is poised to markedly amplify automation in the near future, it is imperative to consider its diverse impacts across various sectors, which could lead to significant social and economic ramifications [78].

One crucial policy recommendation is the Investment in Education and Training. It is essential to equip workers with the skills necessary for the new job landscape shaped by AI. This strategy should encompass AI skills training at all educational levels, from kindergarten to university, and also focus on retraining initiatives for those whose jobs have been displaced by AI advancements. By fostering a workforce that is

agile and adept in AI-related skills, the transition to an AI-integrated job market can be smoother and more inclusive [79].

Another vital approach is Economic Stimulation. To counterbalance the job losses attributed to AI, stimulating the economy to create new employment opportunities is key. This can be achieved through investments in infrastructure and bolstering support for small and medium-sized enterprises (SMEs). Such economic stimulation not only compensates for AI-induced job displacement but also propels economic growth and diversification [80].

Labor Market Reform represents another significant policy direction. Addressing inequality and ensuring equal job opportunities for all is imperative in an AI-dominated job market. This

could involve implementing support programs for the unemployed, increasing minimum wage standards, and motivating companies to invest in retraining their employees. Furthermore, it's crucial to adapt the education sys-tem to leverage AI opportunities and minimize associated risks, while also enhancing social safety nets for low-skilled workers who might be more vulnerable to AI-related job disruptions [81].

State Intervention through Fiscal Policy is another strategy. This involves levying taxes on large tech companies and utilizing the tax revenues to support and retrain workers affected by AI. While it is essential to recognize that AI is still in its devel-opmental stages and its full societal and economic impact remains uncertain, it is likely that AI will increasingly influence our daily lives and job market. Preparing for these changes requires a focus on developing skills pertinent to future job markets and taking necessary steps to address potential negative implications on employment. Additionally, understanding how AI-based automation impacts different demographic groups is crucial in formulating inclusive and effective policies [82].

7 Artificial Intelligence (AI) Various Sectors

The impact of artificial intelligence (AI) on various sectors is a complex and mul-tifaceted phenomenon. The economic effects of AI largely depend on two critical factors: the sector's capability to implement autonomous operation systems and the added value AI applications bring to each area. The focus is particularly sharp in labor-intensive sectors like industry and agriculture, as well as in sectors where AI adds significant value, such as energy, health, and education. The expansion of AI applications in these sectors offers a range of benefits:

In the Industrial Sector, AI is set to bring about a revolutionary shift. The move towards digital factories is essential for maintaining competitiveness in the global market. AI can significantly enhance efficiency and quality of production. For instance, industrial robots are capable of performing strenuous and repetitive tasks, which not only reduces the risk of worker injury but also boosts productivity and speed. This trend is evident in countries like Japan and China, where the use of industrial robots is widespread, particularly in sectors such as automobile manufacturing, smartphone production, and pharmaceuticals [83].

Regarding the Control of Production Processes, AI's role is transformative. It enables the semi-autonomous control of these processes, heralding the era of smart

factory systems with minimal human intervention. This automation spans the entire production chain, from the supply of raw materials to quality control, leading to reduced operation time and heightened efficiency [84].

In the realm of Maintenance, AI demonstrates its prowess through the use of sensors and data analysis. It can proactively identify potential equipment issues before they escalate, thereby reducing downtime and enhancing overall productivity.

Quality Control is another area where AI makes a significant impact. Utilizing computer vision, AI systems can meticulously inspect products for defects. This not only ensures a higher quality of products but also helps in reducing costs associated with quality control failures [85].

In the field of Marketing, AI's ability to analyze purchase data and market ana-lytics is revolutionizing the way companies approach their customers. AI enables the creation of personalized marketing offers, which can lead to increased sales and prof-its. Beyond marketing, AI's contributions span across customer service, finance, sales, and technical

operations in various sectors. This broad application of AI not only heightens competitiveness but also plays a role in combating corruption [86].

In this section, the focus is on the impact of Artificial Intelligence (AI) on the industrial sector, particularly in the State of Kuwait and other Gulf countries. The researcher argues that while AI applications in industry won't completely eliminate the need for human workers, they will significantly alter the nature of work. Humans will still be required for tasks that AI cannot perform, such as innovation, creativity, and complex problem-solving [87].

However, the impact of AI on informal labor in these regions is expected to be substantial. It could lead to job losses in repetitive and labor-intensive sectors. A report by the OECD discusses the potential "hollowing out" of the middle class as automation becomes more prevalent in lower-quality jobs. This represents a significant threat to emerging economies with a large number of low-skill jobs and a substantial informal economy [88].

To adapt to the future of work amidst the rise of AI applications, it's advised that workers learn new skills, remain adaptable and flexible to changes, and maintain a creative and optimistic outlook to overcome future challenges.

The researcher also highlights a key issue in the labor markets of the Gulf region, particularly in the State of Kuwait, which is the quality of human capital. This stems from the declining quality of education and training, with many young adults pursuing qualifications that no longer align with the reality of the labor market. This situa-tion highlights a discrepancy between educational outputs and labor market needs, underscoring the importance of continuous learning and skill development to meet the demands of a rapidly evolving job market influenced by AI and automation [89].

7.1 AI in Agriculture in Kuwait and the Gulf Region

The adoption of AI in agriculture is rapidly evolving and has the potential to rev-olutionize various sectors, including agriculture in Kuwait and the Gulf countries. AI applications are stimulating advancements in precision agriculture and assisting farmers in several key tasks:

1. Crop Monitoring: AI applications use images and videos for remote crop moni-toring, searching for pests and diseases, and assessing soil and crop health. This enables farmers to take proactive measures to prevent the spread of pests and diseases.
2. Irrigation: AI analyzes elements like weather data, soil conditions, and temper-ature to determine optimal irrigation times and water usage, thereby aiding in water conservation and crop yield enhancement.
3. Fertilization: AI uses soil data to determine the required fertilizer quantities, reducing fertilizer costs and improving crop quality.
4. Harvesting: AI can deploy robots for efficient and accurate harvesting at the right time, faster than human capabilities. This reduces labor costs and enhances crop quality.

In addition to these tasks, AI can also improve supply chain management, marketing, and pricing decisions in the agriculture sector.

In the context of Kuwait and the Gulf region, AI can significantly enhance the quality and competitiveness of agricultural products, especially those for export. How-ever, the researcher believes that the use of AI in agriculture in Kuwait and the Gulf countries is not likely to completely replace farmers or agricultural workers, as human decision-making remains crucial for crop cultivation and care. AI is seen as a tool to enhance farmers' productivity and

efficiency. In the future, AI is expected to continue revolutionizing agriculture by improving the productivity and efficiency of farmers and reducing costs, enabling them to achieve greater profits from their agricultural endeavors [90].

7.2 The Impact of AI Use in the Transportation Sector in Kuwait and the Gulf Region

Artificial Intelligence (AI) is an area of significant interest with the potential to bring a real shift in the transportation sector, especially in Kuwait and the broader Gulf region. It is anticipated that AI will have a substantial impact on the future of trans-portation, potentially leading to job displacement in certain areas, such as vehicle operation and infrastructure management. For example, self-driving vehicles could replace human drivers in industries like public transit and freight transportation. Additionally, AI systems might substitute workers in some administrative roles within transportation departments, such as infrastructure management, trip planning, equip-ment maintenance, and logistics operations, utilizing industrial sensors to assess wear and tear [91].

However, AI is also expected to create new job opportunities in areas like mainte-nance of autonomous vehicles, assistance in managing traffic flows, and the design of transportation systems.

In general, AI is expected to have a significant impact on the future of trans-portation across the Gulf region. The new technology has been received positively, particularly in Kuwait and other Gulf countries, showing great potential for transform-ing the transportation landscape. This includes the introduction of innovative services like ride-sharing platforms, which have provided new forms of employment and inde-pendent opportunities for income generation. The adoption of AI in transportation

also points towards significant changes in the job market, necessitating adaptation and the development of new skills [91].

The researcher suggests that while AI may replace certain human tasks, it is not a total substitute for human labor. AI systems can take over specific tasks tradition-ally done by human workers, but they cannot replace all aspects of human labor. Therefore, human workers need to adapt, learning to work alongside AI systems and understanding AI's limitations and capabilities [91].

7.3 The Impact of AI in Healthcare in Kuwait and the Gulf Countries

In recent years, Kuwait and other Gulf countries have been at the forefront of inte-grating artificial intelligence (AI) technologies into their healthcare systems, marking a significant leap in medical innovation and patient care. The adoption of AI in health-care is a global trend, and these nations are actively aligning with this advancement to improve healthcare quality, accessibility, and patient outcomes [92].

Enhanced Diagnostics is one of the key areas where AI is making a significant impact. AI-powered tools are being employed to analyze medical images, such as X-rays and MRI scans, with remarkable accuracy. This technology is a boon for health-care professionals in Kuwait and the Gulf region, aiding in the early detection of diseases, which is pivotal for effective treatment [93].

The rise of Telemedicine has been accelerated by AI, especially beneficial in regions with remote areas. AI-equipped telemedicine platforms enable patients to consult with doctors online. AI's role in triaging cases, providing initial assessments, and offering medical advice is transforming patient care, making it more accessible and efficient [94].

In the sphere of Personalized Medicine, AI's ability to analyze genetic and patient data is facilitating the development of tailored treatment plans. This approach ensures that medical interventions are specifically designed for individual patients, thereby enhancing the effectiveness of treatments [94].

Health Monitoring through wearable devices equipped with AI capabilities is gain-ing traction. These devices offer continuous health monitoring, delivering real-time data to both patients and healthcare providers. This technology is particularly invalu-able in managing chronic conditions, enabling proactive healthcare management [95].

AI is also contributing to Administrative Efficiency in healthcare facilities. Through chatbots and virtual assistants, AI streamlines tasks such as appointment scheduling and responding to patient inquiries, improving the overall operational efficiency of healthcare services [96].

In the Pharmaceutical Industry, AI is revolutionizing drug discovery and devel-opment. The Gulf countries are increasingly investing in AI-driven pharmaceutical research, aiming to uncover innovative solutions for complex healthcare challenges.

During the COVID-19 Pandemic Response, AI played a critical role in tracking and managing the spread of the virus. AI-powered systems were instrumental in con-tact tracing, monitoring quarantine compliance, and optimizing vaccine distribution strategies [96].

Robotic Surgery is another groundbreaking application of AI in healthcare. Advanced hospitals in the Gulf region are employing surgical robots, guided by AI, to assist surgeons in complex procedures. These robots enhance surgical precision and minimize the risk of human error.

While the adoption of AI in healthcare is a promising development, it is not without its challenges. Issues such as data privacy and the need for comprehensive regulatory frameworks are essential considerations to ensure the responsible and ethical use of AI in healthcare. Nonetheless, the commitment of Kuwait and other Gulf countries to embracing these AI advancements reflects their dedication to advancing healthcare and improving patient outcomes in the region [97].

7.4 The Impact of AI in Education

Education, like many other sectors, is embracing the advancements of artificial intelli-gence (AI) to modernize teaching methods. AI has become a hallmark of the modern age and has penetrated various aspects of contemporary life, including mobile phones with intelligent applications, simple and complex computers, mobile and fixed devices, as well as sophisticated electronic applications [98].

AI in education encompasses the ability of machines to learn, deduce solutions, and provide options. It has entered the realm of education, where educators can leverage AI to tailor lessons to the individual personality of each student. Educational AI programs can store data about students' mental abilities, response speed, academic, personal, and cultural preferences. AI can assist teachers in performing various fundamental educational tasks:

1. Assessment: AI-powered applications can be employed in both teaching and assessment. Students can be taught and examined based on their capabilities. AI can analyze their test responses and provide unbiased grading.
2. Remote Learning: Distance learning is a modern form of education, facilitated by e-learning platforms. AI is used to monitor students during remote exams to prevent cheating.

3. Interactive Learning: AI technologies such as machine learning and virtual real-ity are used to create interactive and enjoyable educational experiences for students. These include chatbots with AI, e-learning, and automated learning tailored to indi-vidual student responses, reflecting their personalities and academic and intellectual levels.
4. Classroom Management: Sensors and data analysis are used to monitor students and identify those who need additional assistance. This ensures that all students have an opportunity to learn.

Furthermore, AI can assist teachers in making better decisions about educational content by using AI applications. It allows teachers to improve the quality of education, quickly obtain and verify information, diversify knowledge sources, and document them. This enables teachers to provide better educational services to students.

While AI has the potential to transform education, it's important to note that this technology is still in its growth stages, and its cost can be high. Not all edu-cational institutions can afford it at the moment. Collaboration between educational

institutions and major companies that produce this type of technology may be a solution [99].

In the context of the Gulf region, Kuwait and the United Arab Emirates (UAE)

have shown significant progress in adopting AI in education:

- In the UAE, the first university dedicated to artificial intelligence studies, the "Mohammed bin Zayed University of Artificial Intelligence" in Abu Dhabi, focuses on scientific research and aims to provide specialized programs in the field of artificial intelligence.
- The UAE is also investing in incorporating AI algorithms and curricula into its schools, partnering with the University of Oxford in the UK.
- According to the AI Readiness Index, the UAE ranks sixth in the world, showing great efforts to enhance public services through artificial intelligence. Initiatives like the "Panorama" AI and Big Data center at ADNOC's headquarters and the establish-ment of the "Salem Innovation Center," which is the first autonomous medical fitness center in the region, are examples of this commitment.

The implementation of artificial intelligence (AI) strategies in the education sec-tor has the potential to revolutionize the educational landscape. It will shatter the traditional templates in education that rely on rote learning and transform the role of teachers from mere instructors to experts. Truly, it is the era of AI, and praise be to the All-Knowing Creator who endowed humanity with the creative mind capable of harnessing the wonders of this universe, leading to the development of technologies that leave humans in awe and amazement [99].

The future of education with AI technology is exemplified by the emergence of what is known as the "Teacher Bot." This innovative concept is poised to assist both stu-dents and teachers alike. Some studies have shown that students tend to turn to smart devices more often than their teachers to ask questions. This behavior is attributed to the students' fear of disturbing the teacher and the avoidance of the possibility of receiving negative evaluations for asking repetitive questions. Machines, being devoid of emotions, provide a non-judgmental and patient environment for students to seek clarification and knowledge, thus enhancing the learning experience [100].

The rise of Teacher Bots represents a paradigm shift in the way education is deliv-ered and received, offering a glimpse into the transformative potential of AI in the educational process.

As technology continues to advance, the synergy between human educators and AI-driven tools is expected to redefine the educational landscape, fos-tering a more adaptive and personalized approach to learning that benefits students and empowers teachers to focus on more intricate aspects of education.

In this AI-powered educational era, the possibilities are boundless, and the poten-tial for enhancing the educational journey is limitless. As educators and students embrace these technological advancements, they are poised to embark on an exciting journey towards a more efficient and effective educational future.

Despite the numerous advantages of artificial intelligence in the field of education, there are also notable drawbacks that need to be considered:

1. Lack of Emotion and Responsiveness: AI lacks emotional intelligence and the ability to respond to external stimuli in the same way a human teacher does. Human teachers can empathize with students, understand their emotional states, and provide

the necessary support and encouragement. AI, on the other hand, operates based on algorithms and data and cannot provide the same level of emotional connection and support [100].

2. Absence of Pressure and Accountability: AI-driven educational systems do not exert the same pressure and accountability as human educators. They do not have the ability to communicate with parents or guardians if a student is absent or fails to adhere to school rules and traditions. Human teachers play a crucial role in monitoring and guiding students' behavior and progress, which AI systems cannot replicate.
3. Information Overload and Misinformation: In the era of artificial intelligence, learners may find themselves exposed to the risks of information overload and encoun-tering false or misleading information. It becomes essential for students to verify the accuracy of information, evaluate it using logic, seek evidence, and make compar-isons to arrive at reliable conclusions. This critical thinking and discernment skill is necessary to navigate the vast amount of information available in the digital age.

While AI has the potential to enhance the educational experience, it is crucial to acknowledge these limitations and strike a balance between the benefits of AI and the unique qualities of human educators. The future of education may involve a har-monious coexistence of AI-driven tools and human teachers to provide a holistic and effective learning environment that addresses both the advantages and drawbacks of each approach [101].

The impact of artificial intelligence applications on the job market in the education sector in Kuwait presents several challenges and opportunities. It's important to note that AI mechanisms cannot fully replace the role of teachers. Teachers will always be present, but their role will evolve in terms of their educational and pedagogical value. There are numerous tasks that AI cannot perform, such as effectively communicating with students, motivating them, and providing emotional support. AI, while not a threat, will simplify some of the fundamental teaching tasks.

However, there are two fundamental challenges in the context of the Kuwait labor market in the education sector:

Firstly, there is a significant mismatch between the demand for AI-driven skills and the supply of the workforce in Kuwait. The market's influence on educational institutions is currently weak, and there is a disconnect between the skills demanded by the job market and the skills provided by universities, including renowned ones like Kuwait University. Therefore, there is

a need to develop a strategic plan for education that leverages AI and establishes the necessary technological infrastructure. This should be accompanied by a clear roadmap to transform the education sector into a truly sovereign sector. In the age of artificial intelligence, sovereignty will be held by those who possess technological sovereignty, which extends from classrooms to protecting geographical borders [102].

Secondly, there is an inherent problem in the Kuwaitis education system that leads to an inadequate workforce lacking the required skills. Graduates often receive degrees suitable for office jobs without being equipped with the skills demanded by today's job market. The challenge lies in aligning educational outputs with the demands of the labor market. To address this, the researcher proposes a comprehensive theory of change that focuses on two key axes [103]:

Table 7 Impact of AI in Education – Advantages.

Aspect	Description	Examples	Potential Developments
Personalized Learning	AI tailors education to individual student needs, optimizing learning outcomes.	Adaptive learning software that adjusts content difficulty and style.	More nuanced and sophisticated personalization, enhancing learning efficiency and engagement.
Enhanced Assessment	AI enables precise and timely assessments of student performance.	Automated grading systems, real-time feedback mechanisms.	More accurate and less biased assessments, freeing educators to focus on teaching rather than grading.
Remote Learning Enhancement	AI facilitates and improves the experience of distance learning.	Proctoring software for online exams, interactive e-learning platforms.	Wider reach and improved quality of remote education, making learning more accessible.
Interactive Learning Tools	AI-driven tools make learning more engaging and interactive.	Educational VR experiences, chatbots for learning support.	More immersive and interactive learning experiences that cater to diverse learning styles.
Efficient Classroom Management	AI helps teachers manage classroom tasks and monitor student progress.	Attendance tracking systems, analytics for student performance.	More effective and less time-consuming classroom management, allowing teachers to focus more on teaching.
Educational Content Improvement	AI aids in developing and enhancing educational material.	Content tailored to current events and student interests, updated and improved over time.	Dynamic and continually improving educational content that remains relevant and engaging.

Table 8 Impact of AI in Education - Advantages

1. Short-Term Axis: This involves building new talent pools to meet the immediate needs of the job market by designing and organizing intensive training programs and courses based

on precise job descriptions for graduates. This should be a collaborative effort involving government ministries, private entities, and civil society organizations, with genuine community dialogue leading to the implementation of its outcomes.

2. Long-Term Axis: This includes a comprehensive review and development of the education system, particularly technical and higher education. This should involve a thorough examination of curricula and educational policies to align them with the future requirements of the job market.

By addressing these challenges and implementing these strategies, Kuwait can better prepare its education sector and its workforce for the age of artificial intelligence, ensuring a more seamless transition into the evolving job market [104].

Table 9 Impact of AI in Education – Challenges.

Aspect	Description	Examples	Mitigation Strategies
Lack of Emotional Intelligence	AI lacks the ability to understand and respond to human emotions.	Inability to provide emotional support or adapt to students' mood.	Combining AI tools with human educators to ensure emotional and educational support.
Absence of Accountability	AI cannot enforce discipline or provide the same level of oversight as human educators.	Difficulty in monitoring student adherence to rules, lack of parental interaction.	Hybrid systems where AI supplements but does not replace human oversight and interaction.
Risk of Misinformation	AI systems might provide or reinforce incorrect information.	Students receiving outdated or incorrect information from learning systems.	Regular updates and rigorous checks on the information provided by AI systems.
Digital Divide	Not all students or institutions have equal access to AI technologies.	Disparities in AI-enhanced learning experiences between different regions or socio-economic groups.	Policies to provide equitable access to technology and training for all students and educators.
Job Market Mismatch	The skills provided by AI-driven education might not align with labor market needs.	Graduates lacking the skills demanded by employers.	Continuous industry collaboration to ensure educational programs align with evolving market needs.
High Implementation Costs	The cost of AI technology can be prohibitive for some institutions.	Smaller or underfunded schools unable to afford AI tools.	Funding models or partnerships to make AI in education more accessible to all institutions.

Table 10. Impact of AI in Education - Challenges

8 Conclusion

Artificial intelligence (AI) is a rapidly evolving technology with the potential to have a profound impact on the job market. While AI is expected to lead to the loss of some jobs, it is also expected to create new ones. The impact of AI on the job market depends on several factors, including the extent of AI adoption. The more widespread AI becomes, the higher the likelihood of job displacement.

The nature of a job also plays a crucial role in its susceptibility to AI disruption. Jobs that involve repetitive, routine, or hazardous tasks are more likely to be at risk from AI, whereas jobs that require creative, analytical, or human skills are likely to continue to grow and coexist with AI. Therefore, significant effects on the job market are anticipated in the coming years.

It is essential for us to be aware of the potential effects of AI and take steps to mitigate negative consequences. AI and its various applications have become an inevitable choice for developing nations, including Kuwait and other Gulf countries,

to break free from economic underdevelopment and achieve sustainable development. However, there are still many challenges and limitations that need to be addressed proactively. To prepare the country for the digital age and the widespread adoption of AI, comprehensive strategies should be put in place. These strategies should include poli-cies that promote a digital culture, encourage society to embrace AI applications, and address the ramifications of AI. By doing so, countries can harness the potential benefits of AI while managing its challenges effectively.

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