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Research Article

A Proposal to Employ Artificial Intelligence Applications in Developing Prince Sattam Bin Abdulaziz University Students' Future Skills

Alyaa Omar Kamel Faraj

Department of Educational Sciences, College of Education in Al-Dilam, Prince Sattam Bin Abdulaziz University, Al-Kharj 11942, Saudi Arabia

Correspondence should be addressed to Alyaa Omar Kamel Faraj; lolo_1111112000@yahoo.com

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This study aimed to identify the requirements for employing artificial intelligence applications, determine the future skills to be acquired by Prince Sattam Bin Abdulaziz University (PSAU) students, and develop a proposal for the requirements of employing artificial intelligence applications in the development of students' future skills. To achieve this aim, the author used the descriptive method where an author-developed 50-item questionnaire was administered to 150 faculty members. The participating faculty members rated the extent to which the requirements were present and the level of students' mastery of future skills. The results revealed the significance of integrating artificial intelligence in university education to accelerate progression towards the achievement of the fourth aim of sustainable development and to activate the substantial role of universities in developing students' future skills. The study identified the requirements for employing artificial intelligence applications in developing students' future skills. The identified requirements fell into five areas: the learning environment, faculty members, courses, students, and graduates. The future skills that were identified included soft skills, lifelong learning skills, and digital skills. The study ended with a proposal to employ artificial intelligence applications in developing the future skills of PSAU students.

1. Introduction

In an increasingly digital world, information and communication technologies play a vital role as agents of development that can facilitate the capacities of countries to achieve the United Nations Sustainable Development Goals (SDGs). These technological developments induce changes in labor markets, creating and increasing the need to prepare skilled individuals to expand economic participation, advance economic development, and compete in the global economy [1].

There is general consensus that nurturing human resources and providing individuals with competencies that enable them to engage in life constructively and responsibly is one of the approaches which the UNESCO has supported to achieve goals of sustainable development. Therefore, the concept of education for sustainable development emerged to refer to the essential role of education in furnishing individuals with skills and competencies so that they can participate in building effective human capital and achieving goals of sustainable development from a broad perspective [2].

One of the concepts that has become popular recently and is substantially related to the tools of achieving sustainable development is artificial intelligence (hereafter AI), which is the common denominator in a growing variety of leading technologies. Recently, AI has become effective in achieving sustainable development, paving the way for an age in which individuals have to make use of AI in life and work. The advent of the age of AI has raised a substantial question of how educational systems can prepare individuals to effectively use AI in life and work [3].

AI can have good implications for teaching and learning, but at the same time, it is not void of risks. Thus, preparing educational systems for the age of AI entails that benefits and potential risks of AI be studied in the pursuit of sustainable development goal 4 and the 2030 Education Agenda. Thus, there is a pressing need to provide equitable and comprehensive education, and lifelong learning opportunities. This entails that all available resources, especially potentials inherent in leading technologies, be exploited [4].

In fact, investing the potentials of AI to support education for sustainable development requires an ongoing review of the ways in which education is organized, which may entail reshaping the basics of education towards the attainment of SDG [4]. There are questions about what can be achieved by integrating AI in education. What are the real benefits of AI? How do we guarantee that AI is integrated to meet real needs, not just to be following all the vogue in instructional technology? What does AI allow to do? [5].

In order to unleash the opportunities and eliminate potential risks and to help educational systems respond to these challenges, the UNESCO, in cooperation with the Chinese government, organized the International Conference on Artificial Intelligence and Education in Beijing in 2019. The final act of the conference [6] called for taking the necessary measures to systematically combine AI and education for innovation in the fields of education, teaching, and learning. It also called for harnessing AI to accelerate the creation of open and flexible educational systems that provide opportunities for quality, equitable, and lifelong learning for all.

AI requires rethinking the societal role of education, as the traditional formal education provided by universities may not be sufficient in the era of digital economies and AI applications. In the twenty-first century, information has become ubiquitous, and it is no longer sufficient to eradicate "data literacy," so students can read, analyze, and manage information. Additionally, there is a need to nurture "artificial intelligence literacy" to empower critical thinking on how to engage smart computer systems in recognizing, selecting, and interpreting information [7].

Furthermore, the educational system in an ever-evolving labor market no longer aims to teach students one specific profession. Rather, it should enable students to be versatile, flexible, and well-prepared for a world in which technologies create a dynamic labor market where individuals need to regularly re-educate themselves.

The report issued by the Mohammed Bin Rashid Al Maktoum Knowledge Foundation and the United Nations Regional Office [8] stressed the need to bring about a change in educational institutions and systems in order to be able to anticipate the skills necessary for future success and make them part of educational programs. Therefore, scientific, technological, engineering, mathematical, and programming skills have become essential for today's university students. Such skills enable students to develop a competitive advantage and use technologies that enhance their innovative capabilities. However, these skills will not be enough for students to integrate into the labor market after completing their education.

Accordingly, the Future of Jobs Report 2020–2025 [9] addressed the most important public and private skills that universities should focus on to keep pace with the labor market. These include the ability to solve complex problems, critical thinking, creativity/innovation, management of individuals and teams, work and coordination with others, emotional/social intelligence, insight, judgment, decision-making, negotiation, and cognitive flexibility.

Students' future skills need to be enhanced, so universities can play their role in harnessing the potentials of AI technologies. Mastery of these skills enhances students' ability to develop along with the changing needs of the labor market. It is the universities' responsibility to prepare and graduate a generation of technology pioneers. They cannot achieve this without employing AI applications and developing future skills in their students. The purpose of this study was to explore the following three research questions:

(1) What are the requirements for employing AI applications among PSAU students?

(2) What are the future skills that should be acquired by PSAU students to meet the requirements of the labor market?

(3) What are the features of the suggested proposal to employ AI applications in developing PSAU students' future skills?

The above three research questions have been explored from faculty members' perspectives based on a systematic literature review.

2. Literature Review

2.1. University Education and the Employment of AI Applications. A research mainstream is concerned with the applications of AI in university education. Al-Qahtani et al. [10] explored the level of conceptual awareness and attitude towards AI and its applications in education among Princess Nourah Bint Abdulrahman University students. The results revealed that students from different colleges had a high degree of conceptual awareness of AI. Furthermore, the level of employing AI applications in education by the students was found to be high. In a related context, Al-Muqaiti and Ahmad [11] investigated the reality of the employment of AI and its relationship with the quality of performance of Jordanian universities from the point of view of the faculty members. The results showed that the degree of AI employment in Jordanian universities was medium. Furthermore, a statistically significant correlation was found between the degree of AI employment and the total degree of quality performance of Jordanian universities. To identify the impact of employing AI applications in higher education, Shaaban [12] surveyed the concept of AI and its positive effects on education, its applications in higher education, and the most important challenges facing its use. The study concluded that many applications of AI can be employed in higher education.

Hariri [13] presented a proposal to employ AI to support education in Saudi universities to confront the COVID-19

pandemic in the light of the Chinese experience. The results revealed that the applications of AI and e-learning systems were used as an aid to the educational process in Saudi universities during the ban period. The Saudi universities were reported to employ modern AI applications by establishing a number of educational electronic platforms to cover the content of the curricula for all students in all Saudi universities. Ashohnah and Moneim Edesouky [14] identified the determinants and dimensions of AI and could present a proposal to improve the performance of higher education institutions in Egypt in the light of AI. The authors recommended establishing an infrastructure commensurate with the technologies and innovations of the era and taking measures to establish centers that adopt the application of modern technologies, including AI in higher education institutions in Egypt. Assobhi [15] investigated the reality of Najran University faculty members' use of AI applications that can be employed in the educational process and the challenges they faced in using them. The results revealed that the utilization of AI applications by faculty members was very low. There was a noticeable agreement by participants on the existence of many challenges that inhibit the use of these applications.

2.2. Future Skills. Another research mainstream is concerned with the future skills that educational institutes should develop in students. Al-Bisher and Abdullah [16] conducted a study to identify the extent of the required life skills for the labor market among preparatory programs students at Imam Mohammed Bin Saud Islamic University from the perspective of faculty members. That research attempt developed a list of life skills containing three main categories: higher thinking skills, communication and social communication skills, and psychological and emotional skills. The most remarkably available skills were the psychological and emotional skills, followed by the communication and social communication skills and higher order thinking skills.

Alazab [17] sought to identify the characteristics of faculty members in the light of the requirements of the twenty-first century from the perspective of undergraduate students and the relationship between these characteristics and students' acquisition of the twenty-first century skills. A statistically significant correlation was found between the characteristics of faculty members and their ability to equip their students with the twenty-first century skills. The skills that were acquired most by students were communication skills and the use of technology, followed by life and profession skills and learning and innovation skills. Finally, the total degree of the characteristics of faculty members in the light of the requirements of the twenty-first century could predict the skills that could be acquired by university students.

Al-Dahshan et al. [18] sought to present a proposal for developing the skills needed for future occupations and jobs in the light of the Fourth Industrial Revolution. The skills that a sample of faculty members at Menoufia University indicated as extremely important fell in three sets: learning and creativity skills, digital culture skills, and life and work skills. They also indicated that these skills were moderately possessed by students. The degree to which the requirements for developing these skills were possessed by students was found to be moderate. The investigation then ended with a proposal for meeting the requirements of developing the skills needed for future occupations and jobs in the light of the Fourth Industrial Revolution.

Moneim and Hussein [19] aimed to develop the skills of the twenty-first century of Egyptian students in advanced industrial technical education in order to keep pace with the ever-evolving requirements of the labor market that is characterized by change and continuous development. The research proceeded from providing a general framework for the skills of the twenty-first century, surveying the relationship between the requirements of the labor market and the skills of the twenty-first century, investigating the reality of the skills of the twenty-first century among students of advanced industrial technical education in Egypt to keep pace with PAT, the labor market, and finally presenting a proposal for developing targeted students' twenty-first century skills to keep up with the labor market requirements.

Al-Awda et al. [20] investigated the role of Saudi universities in meeting the needs of the labor market from the perspective of academic experts and Saudi experts in the business sector. The study concluded that jobs in the Saudi labor market require mastery of computing, technology, communication, and teamwork skills. The researchers thus recommended that Saudi universities adopt paradigms that can enhance these skills among students.

Finally, Al-Khodari et al. [21] researched the requirements for developing the future skills in Saudi universities regarding the three functions of the university: research, teaching, and community services. The authors recommended (a) presenting the required support to researchers and encouraging them to base their future research endeavors on skill development, (b) expanding the use of assistive technology in teaching and assessment, and (c) enhancing cooperation between the university and community institutions to achieve the future needs of the society.

3. Methodology

3.1. Study Population and Sample. To achieve the aims of the study, the author used the descriptive analytical method. The original population of the study consisted of faculty members at PSAU in the second semester of the academic year 2020–21 ($N = 2057$ as listed on the university's portal). The questionnaire was electronically sent to faculty members via the university's official database of faculty members' e-mails, which is a service the university offers to researchers. A cohort of 150 faculty members responded to the questionnaire. They represented the various specializations: human studies, arts, health, and engineering. Table 1 shows characteristics of the participants.

3.2. The Instrument. To collect the required data, the author developed a 50-item questionnaire that had two main dimensions. The first dimension had 30 items related to the

Table 1: Participants and their distribution based on gender, rank, and experience.

Variable		Frequency	%
Gender	Male	59	39.3
	Female	91	60.7
Rank	Lecturer	15	10.0
	Assistant professor	96	64.0
	Associate professor	32	21.3
	Professor	7	4.7
Experience	Less than 5 years	43	28.7
	From 5 to 10 years	60	40.0
	More than 10 years	47	31.3
Total		150	100.0

requirements of employing AI applications. That dimension included five subdimensions: the learning environment (6 items), courses (5 items), faculty members (7 items), students (7 items), and graduates (5 items). The second dimension had 20 items related to future skills. That dimension included three subdimensions: soft skills (8 items), lifelong learning skills (7 items), and digital skills (5 items). The participants were asked to respond to items by selecting one of five anchors ranging from strongly agree = 5 to strongly disagree = 1.

The face and content validity of the questionnaire was established by five faculty members specialized in education and instructional technology who were asked to judge the wording of items and the inclusion of items under their respective dimensions. They judged clarity based on a 3-point scale: clear, somehow clear, and not clear. They judged the inclusion of items under their respective dimensions via a 3-point scale: related, somehow related, and unrelated. An agreement of 75% was set as a criterion to accept the jury members' viewpoints. As a result, some items were reworded.

To establish the construct validity of the questionnaire, the questionnaire was pilot-tested on 30 faculty members from outside the main study sample. Correlations among items and their respective dimensions were then computed. Items correlated with the dimension of the requirements of employing AI applications with coefficients ranging between 0.39 and 0.89, and with the future skills dimension with coefficients ranging between 0.56 and 0.91. All correlation coefficients were significant at the 0.01 level. Furthermore, the intercorrelations among the subdimensions were high, as shown in Table 2. The high correlation values mentioned above and in Table 2 indicate that the questionnaire had good construct validity.

As to reliability, the subdimensions of the learning environment, courses, faculty, students, graduates, and the total requirements dimension yielded alpha reliability estimates of 0.75, 0.76, 0.71, 0.75, 0.77, and 0.80, respectively. The subdimensions of soft skills, lifelong learning skills, digital skills, and the total future skills dimension yielded alpha reliability estimates of 0.73, 0.71, 0.76, and 0.82, respectively. All alpha reliability estimates were significant at the 0.01 level, hence indicating that the questionnaire was quite reliable.

3.3. Data Analysis. To answer the research questions, means and standard deviations were computed using the SPSS program. For purposes of data analysis, to identify whether means were high, average, or low, the following equation was used: the highest score (5) minus the lowest score (1) divided by the number of required agreement categories (3), i.e., (5-1)/3 = 1.33. The value 1.33 was then added to the end of each category. Accordingly, means from 1.00 to 2.33, from 2.34 to 3.67, and from 3.68 to 5.00 were considered low, average, and high, respectively.

4. Results and Discussion

4.1. The Requirements for Employing AI Applications among PSAU Students. As listed in Table 3, the requirements for employing AI applications among PSAU students were average in general ($M = 3.60$). This does not live up to the level of ambitions and hopes placed on these programs. Thus, they need to be enhanced by reconsidering educational practices and developing them to employ AI applications among students. This same finding and assertion were reported by Al-Muqiti and Abu Al-Ola [11, 12]. A closer look at the table shows that the "students" subdimension attained the highest mean ($M = 3.73$), which stresses that students are the cornerstone of the educational process and its final outcome. It is therefore extremely important to equip students with the skills required in the labor market through integrating AI applications in their education, making the learning environment as smart as possible and training faculty members on the use of recent technologies. Meanwhile, the "courses" subdimension came last with a mean of 3.40, which is logical given the high cost of integrating AI technologies in education. It is important to create a digital repository containing training materials related to AI and other basic educational resources related to digital skills. It is also important to develop electronic courses that allow for the application of AI. The following sections present the descriptives of the participants' responses to the items of the questionnaire's subdimensions.

4.1.1. The Learning Environment. It is obvious from Table 4 that means of the "learning environment" items ranged between 3.53 and 3.7. The item reading "The learning environment provides a supportive and positive learning culture" attained the highest mean ($M = 3.73$). This refers to the significance of creating a smart learning environment that supports innovation, meets students' needs, and encourages them to employ AI tools in their learning. This finding concurs with the study of Hariri [13] that reported the priority of integrating AI applications to support learning in Saudi universities. The item reading "The learning environment is provided with AI applications" ranked last with a mean of 3.53. This is attributable to the poor infrastructure in terms of recent technologies and lack of basic skills to employ AI applications.

4.1.2. Courses. As presented in Table 5, means of the "courses" subdimension ranged between 3.09 and 3.61. The item reading "Courses enhance curiosity and self-learning" ranked first with an average of 3.61. This refers to the need to

Table 2: Correlations among dimensions of the questionnaire.

	The requirements of employing AI applications					
	The learning environment	Courses	Faculty	Students	Graduates	Total
The learning environment	1					
Courses	0.538**	1				
Faculty	0.479**	0.603**	1			
Students	0.501**	0.245	0.743**	1		
Graduates	0.424*	0.454*	0.817**	0.758**	1	
Total	0.718**	0.669**	0.914**	0.835**	0.873**	1
	Future skills					
	Soft skills	Lifelong learning skills	Digital skills	Total		
Soft skills	1					
Lifelong learning skills	0.776**	1				
Digital skills	0.408*	0.481**	1			
Total	0.894**	0.891**	0.614**	1		

**Significant at the 0.01 level. *Significant at the 0.05 level.

Table 3: Descriptives of the requirements for employing artificial intelligence applications among PSAU students in descending order.

No.	Subdimensions	M	SD	Rank	Degree of agreement
4	Students	3.73	0.70	1	High
5	Graduates	3.64	0.83	2	Average
1	The learning environment	3.63	0.73	3	Average
3	Faculty members	3.56	0.68	4	Average
2	Courses	3.40	0.69	5	Average
	Total	3.60	0.58		Average

Table 4: Descriptives of the "learning environment" subdimension in descending order.

No.	Items	M	SD	Rank	Degree of agreement
1	The learning environment provides a supportive and positive learning culture	3.73	1.03	1	High
2	The learning environment allows communication anytime and anywhere	3.71	1.11	2	High
4	AI applications are integrated in managing the educational situation	3.65	0.86	3	Average
3	The learning environment makes it easy to access information	3.59	1.00	4	Average
5	The learning environment helps the learner participate in constructing knowledge	3.57	0.86	5	Average
6	The learning environment is provided with AI applications	3.53	0.88	6	Average
	Total	3.63	0.73		Average

adopt courses that can enhance creativity and productivity by encouraging self-learning and cooperative learning, and self-assessment. The item "Educational activities are linked to AI applications" ranked last with a mean of 3.09. This refers to lack of interest in employing AI applications in educational activities though they are extremely important for the curriculum to achieve the required outcomes.

4.1.3. Faculty Members. The data in Table 6 reveal that means of the "faculty members" subdimension ranged between 3.15 and 3.87. The item "Use the Blackboard in teaching courses" attained the highest mean ($M = 3.87$). This stresses the importance of the Blackboard application as a recent system adopted by the university to improve the educational process. This finding is in line with the study of Hariri [13] that reported the need to benefit from the applications of AI and technological programs in supporting education in Saudi universities to confront the corona pandemic. Meanwhile, the item "Can employ AI applications in the warm-up phase of the lesson" came last with a mean of 3.15, which refers to faculty members lacking the experience of employing AI-based learning programs. This same finding was reported in the study of Assobhi [15].

4.1.4. Students. The data in Table 7 show that the mean scores of the "students" subdimension ranged between 3.68 and 3.87. The items that attained the highest means were "Students register their courses according to a precise electronic plan" ($M = 3.87$), "Students receive ongoing feedback on their performance" ($M = 3.85$), and "Students are encouraged to practice creativity and imagination" ($M = 3.79$). This indicates that students are increasingly using AI technologies in registering courses, receiving feedback, and exchanging opinions with colleagues. This concurs with Al-Dayel's [10] study that found a positive attitude among students towards employment of AI applications.

4.1.5. Graduates. It is clear from Table 8 that mean scores of the "graduates" subdimension ranged between 3.49 and 3.83. The item reading "The university offers training programs to

Table 5: Descriptives of the "courses" subdimension in descending order.

No.	Items	M	SD	Rank	Degree of agreement
11	Courses enhance curiosity and self-learning	3.61	1.18	1	Average
7	Courses are designed based on AI	3.51	1.05	2	Average
8	Critical thinking skills needed to employ AI applications are targeted in courses	3.39	0.97	3	Average
9	Curricula and courses are updated in line with AI applications	3.38	0.86	4	Average
10	Educational activities are linked to AI applications	3.09	1.07	5	Average
	Total	3.40	0.69		Average

Table 6: Descriptives of the "faculty members" subdimension in descending order.

No.	Items	M	SD	Rank	Degree of agreement
14	Use the Blackboard in teaching courses	3.87	0.98	1	High
12	Employ technology in classrooms	3.75	0.83	2	High
18	Realize the concept of AI	3.69	0.99	3	High
15	Have access to training programs to develop their skills of using AI applications	3.59	1.12	4	Average
17	Design a stimulating learning environment	3.45	1.08	5	Average
16	Participate in seminars, training courses, and academic conferences of other universities	3.44	1.03	6	Average
13	Can employ AI applications in the warm-up phase of the lesson	3.15	1.13	7	Average
	Total	3.56	0.68		Average

Table 7: Descriptives of the "students" subdimension in descending order.

No.	Items	M	SD	Rank	Degree of agreement
19	Students register their courses according to a precise electronic plan	3.87	1.01	1	High
23	Students receive ongoing feedback on their performance	3.85	0.96	2	High
24	Students are encouraged to practice creativity and imagination	3.79	0.96	3	High
22	Students are motivated to discover information for themselves	3.73	0.96	4	High
21	Students do their assignments through several smart applications	3.70	0.90	5	High
25	AI applications provide students with self-learning opportunities	3.69	0.99	6	High
20	Students use AI applications to exchange opinions with colleagues	3.68	1.16	7	High
	Total	3.73	0.70		High

Table 8: Descriptives of the "graduates" subdimension in descending order.

No.	Items	M	SD	Rank	Degree of agreement
30	The university offers training programs to equip graduates with the skills required in the labor market	3.83	1.09	1	High
29	The university integrates life skills into the curriculum through communication with technical industrial institutions	3.71	1.06	2	High
27	The university offers a lifelong learning initiative through which graduates update themselves	3.60	1.15	3	Average
26	University education is isolated from the demands of the labor market due to the rapid change in jobs and the rapid impact of AI	3.58	0.98	4	Average
28	The spread of digital technology leads to a severe job shortage for graduates	3.49	1.12	5	Average
	Total	3.64	0.83		Average

equip graduates with the skills required in the labor market" ranked first with a mean of 3.83. This refers to the university's role in making partnerships with industrial institutions and civil society organizations. By such partnerships, academic programs can meet the actual needs of industrial institutions. This finding is supported by the report issued by the King Faisal Center for Research and Islamic Studies entitled "How do Saudi youth view skills of future jobs?" [22] That report asserted that receiving online training is one of the most important venues for the Saudi youth to acquire technical skills. The item that received the lowest mean ($M = 3.49$) was "The spread of digital technology leads to a severe job shortage for graduates." The reason for this is the limited number of graduates who are qualified to occupy vacancies in the labor market. Graduates with advanced digital skills can benefit from a wider range of job opportunities resulting from the continuous developments in digital technologies. Advances in AI are expected to drastically change patterns of consumption, production, and employment. This was confirmed in the recommendations of the International Conference on Education Evaluation [23] entitled "Future Skills: Development and Evaluation" where a call was raised for increasing partnerships between educational institutions and business sectors in order to

reduce the gap between future skills and the skills of the new generation of job seekers.

4.2. The Future Skills That Should Be Acquired by Students to Meet the Requirements of the Labor Market. It can be seen from the data in Table 9 that the participants' ratings of the future skills needed for students to meet the needs of the labor market were high ($M = 3.86$). This is in line with what was mentioned in the International Telecommunication Union report [24] that future skills are important for opening a wide range of digital job opportunities in the twenty-first century. The expansion in the digital economy entails that students acquire a range of digital skills, as well as the skills of problem-solving, critical thinking, negotiation, effective communication, and self-learning. Based on the participants' ratings, digital culture skills ranked first with a mean of 3.96, followed by lifelong learning skills ($M = 3.85$) and soft skills ($M = 3.80$). The following sections present the descriptives of the participants' ratings of the items of the three "skills" dimensions (Tables 10 and 11).

4.2.1. Soft Skills. It is obvious that the participants highly agreed ($M = 3.80$) to the significance of soft skills for the development of students' future skills. That is, they highly agreed that students need to develop the skills of problem-solving, critical thinking, negotiation, effective communication, and self-learning. These skills enable students to work more effectively in the era of the knowledge economy. This finding is consistent with Al-Dahshan et al.'s [18] study that documented the importance of learning and creativity skills, digital culture skills, and life and work skills for future jobs. The mean scores of the seven items ranged between 3.61 and 4.06, with the items "Solve problem creatively" ($M = 4.06$), "Communicate with others effectively via different apps" ($M = 3.89$), and "Apply problem-solving strategies in new contexts" ($M = 3.85$) ranking first, second, and third, respectively. This finding concurs with Abdelmoneim's [19] study that stressed the importance of developing twenty-first century skills among students to keep pace with the renewed requirements of the labor market.

4.2.2. Lifelong Learning Skills. As presented in Table 11, the participants highly agreed ($M = 3.85$) to the significance of lifelong learning skills for the development of students' future skills. This finding is in agreement with Delor's [25] report that stressed the necessity of students possessing lifelong learning skills through four basic pillars: learn to know, learn to do, learn to live together, and learn to be. The mean scores of this dimension's items ranged between 3.66 and 4.09, with the items "Understand and respect cognitive and cultural diversity" ($M = 4.09$), "Solve problems, research, analyze, and manage projects" ($M = 3.91$), and "Appreciate cooperation with others" ($M = 3.84$) ranking first, second, and third, respectively. This result is consistent with Al-Bisher and Abdullah's [16] study that recommended the creation of a stimulating educational environment for students by using methods and strategies that encourage them and develop their personal skills.

Table 9: Descriptives of the future skills that should be acquired by PSAU students to meet the requirements of the labor market.

No.	Skills	M	SD	Rank	Degree of agreement
3	Digital culture skills	3.96	0.55	1	High
2	Lifelong learning skills	3.85	0.76	2	High
1	Soft skills	3.80	0.68	3	High
	Total	3.86	0.57		High

4.2.3. Digital Culture Skills. From the data in Table 12, it can be seen the participants highly agreed ($M = 3.96$) to the significance of digital culture skills for the development of students' future skills. This seems logical as these skills have become of great value in the digital age we live in. This finding is consistent with Alazab's [17] study where digital skills attained high ratings compared to other skills. The items that obtained the highest ratings were "Search for job opportunities available on websites" ($M = 4.34$), "Use digital technology to search, evaluate, and share information" ($M = 3.97$), and "Observe the intellectual property rights of information available on the Internet" ($M = 3.93$). This same finding was reported by Al-Khodari et al. [21] who called for more emphasis to be placed on the use of assistive technology to achieve the society's future needs.

4.3. Features of the Proposal to Employ AI in the Development of Students' Future Skills. Based on the results of the field study, a proposal was constructed for the requirements of employing AI applications in developing PSAU students' future skills. The proposal is based on a number of premises and principles and includes implementation mechanisms and procedures.

4.3.1. Premises of the Proposal. The proposal is based on the following premises:

(i) Integrating AI technologies in education in order to enhance human potentials, protect human rights, achieve sustainable development, and guarantee quality and equitable education opportunities and lifelong learning for all

(ii) Enabling university students to employ AI applications, which require changing the content of academic programs and methods of teaching and assessment

(iii) Helping students to develop new forms of critical thinking, including algorithmic awareness and the ability to reflect on the impact of AI on knowledge and decision-making

(iv) Achieving compatibility between university education, the needs of the labor market, and the development of students' future skills

Table 10: Descriptives of soft skills in descending order.

No.	Item	*M*	SD	Rank	Degree of agreement
1	Solve problem creatively	4.06	0.97	1	High
8	Communicate with others effectively via different apps	3.89	1.04	2	High
2	Apply problem-solving strategies in new contexts	3.85	0.91	3	High
7	Use body language to promote effective communication	3.79	0.95	4	High
3	Possess the spirit of inquiry, research, and criticism	3.75	0.87	5	High
5	Avoid rushing into discussion and judgment	3.75	0.91	6	High
6	Judge content, not form	3.67	0.99	7	Average
4	Employ scientific knowledge in new contexts	3.61	0.92	8	Average
	Total	3.80	0.68		Average

Table 11: Descriptives of lifelong learning skills in descending order.

No.	Item	*M*	SD	Rank	Degree of agreement
12	Understand and respect cognitive and cultural diversity	4.09	0.78	1	High
9	Solve problems, research, analyze, and manage projects	3.91	1.01	2	High
11	Appreciate cooperation with others	3.84	0.87	3	High
13	Use technology effectively	3.84	0.90	3	High
14	Make effective use of technological tools	3.84	1.10	3	High
10	Construct new knowledge and design solutions	3.79	1.03	6	High
15	Contribute to change management and rely on oneself to achieve lifelong learning	3.66	1.13	7	Average
	Total	3.85	0.76		High

Table 12: Descriptives of digital culture skills in descending order.

No.	Item	*M*	SD	Rank	Degree of agreement
20	Search for job opportunities available on websites	4.34	0.70	1	High
16	Use digital technology to search, evaluate, and share information	3.97	0.83	2	High
18	Observe the intellectual property rights of information available on the Internet	3.93	0.91	3	High
19	Adhere to the etiquette of dialogue on social networks	3.86	0.85	4	High
17	Read software and application agreements before using them	3.69	0.84	5	High
	Total	3.96	0.55		High

4.3.2. Objectives of the Proposal. The main aim of the proposal was to set requirements to activate the role of Saudi universities in employing AI applications in developing the future skills of their students. What follows are the objectives of the proposal:

(i) Gearing university policies, strategies, and organizational structures towards realizing the concept of smart university

(ii) Developing graduates' skills to meet the needs of the labor market and achieve development

(iii) Integrating AI technologies into university education

(iv) Developing students' future skills that are necessary for life and work in the age of AI

(v) Strengthening partnership between the university and productive and industrial institutions via joint projects and work strategies to achieve sustainable development

4.3.3. Rationale of the Proposal

(i) The Kingdom's 2030 Vision that calls for employing AI applications in universities, enhancing universities' technological infrastructure, and equipping youth with the knowledge and skills needed for future jobs

(ii) The increasing demand on jobs that require possession of digital skills in data economy and AI

(iii) The statistics issued by Riyadh Economic Forum [26], which have stressed the existence of a gap between students' skills (job seekers) and the skills needed for the labor market

(iv) The recommendations of the International Conference on Education Evaluation [23], which emphasized the importance of integrating future skills into the curricula of public schools and universities in order to educate the new generation for future jobs

4.3.4. Requirements and Mechanisms of Implementing the Proposal. In light of the responses of the participating faculty members and the results of previous studies [27–30], a proposal was suggested to meet the requirements to employ AI applications in developing students' future skills, which is shown in Table 13 [27–30].

4.3.5. Obstacles of Implementing the Proposal and How to Overcome Them. The implementation of the proposal may

Table 13: The suggested proposal for meeting the requirements to employ AI applications in developing students' future skills.

No.	Improvement areas	Implementation mechanisms
1	The learning environment	(1) Enhancing the infrastructure in universities to employ AI applications in education (2) Making the e-learning environment flexible, participatory, and conducive for getting students to self-learn and share experiences (3) Equipping classrooms to allow for the employment of AI applications and using virtual classrooms side by side with traditional classrooms (4) Providing electronic libraries and virtual laboratories to conduct scientific research, experiments, and scientific discoveries
2	Courses	(1) Reconsidering academic programs and curricula to meet the requirements of national development plans and the needs of the labor market (2) Including future skills in courses to meet the needs of the labor market, including digital knowledge, innovation, entrepreneurship, leadership, and problem-solving (3) Creating an online digital repository where free training is offered to all on the development of AI skills (4) Conducting research to assess the impact of electronic courses on students' learning outcomes, including knowledge, skills, and values
3	Faculty members	(1) Training faculty members on the use of AI applications in teaching (2) Supporting professional development programs to enhance faculty members' AI skills (3) Creating interactive digital content by educationally and technologically qualified faculty members and making it accessible to all students (4) Developing strategies to enable faculty members to employ teaching methods that foster active and autonomous learning
4	Students	(1) Furnishing students with a wide range of future skills, i.e., critical thinking, creativity, use of digital computers, independent learning, cooperation, and effective communication (2) Enhancing students' knowledge of AI, critical thinking, adaptability, and resilience in the labor market, and the importance of ensuring that AI technologies comply with clear ethical standards that respect human dignity and rights (3) Focusing on student-centered learning approaches that enhance experiential learning and encourage creativity-based learning away from memorization and indoctrination (4) Enhancing students' knowledge, values, and skills that are necessary for employing AI applications in the labor market (5) Establishing laboratories and centers to train students on technological innovations of practical importance
5	Graduates	(1) Making cooperation agreements with the Saudi Data and Artificial Intelligence Authority (SDAIA) in the areas of adopting and developing technical services, exchanging data, and establishing joint electronic services (2) Establishing partnerships with productive and industrial institutions to share research and training results in AI technologies (3) Encouraging internationalization in AI by strengthening cooperation with international universities and harnessing the capabilities of AI to overcome the current difficulties facing education systems (4) Establishing a university information bank on the needs of the labor market, repositories of definitions of technological problems and challenges, and the external stakeholders associated with them

Table 14: Obstacles of implementing the proposal and how to overcome them.

No.	Obstacles	How to overcome them?
1	Weak trust between universities and production and industrial institutions that can deter joint work between them	(i) Providing advantages to productive and industrial institutions that support partnership with universities, e.g., (a) Providing them with technical, research, and advisory services (b) Giving them access to universities' databases (c) Providing them vocational training by qualified academic cadres
2	Lack of qualified cadres to move towards AI and lack of AI specializations in graduate programs that qualify researchers in the field of AI	(i) Recruiting competent faculty members (ii) Providing professional development programs in the field of AI (iii) Conducting applied research in areas related to AI and robotics
3	Relying on traditional curricula that are not compatible with AI	(i) Including AI applications in academic programs (ii) Creating a digital repository containing training materials related to AI skills and other resources of digital skills

Table 14: Continued.

No.	Obstacles	How to overcome them?
4	Weak infrastructure in terms of software, technological tools, and networks	(i) Updating the infrastructure to be compatible with technological innovations
5	Lack of skills that are necessary to adapt to the future labor market	(i) Including learning outcomes that emphasize graduates' possession of technological and future knowledge and skills in the National Qualifications Framework
6	Lack of funding and financial resources to support emerging technologies	(i) Adopting the ambitious Vision 2030 that calls for partnership with the private sector and promoting smart communication among the government

encounter some obstacles. The possible obstacles and how to overcome them [27–30] are presented in Table 14.

5. Conclusions

By surveying the opinions of faculty members, the current study investigated the extent to which the requirements for employing AI applications among PSAU students are present. It also surveyed faculty members' opinions about the future skills that should be acquired by students to meet the needs of the labor market. Based on the participants' opinions, a proposal was suggested to enhance the possibility of employing AI in teaching students to help them develop the future skills that the participants deemed as important. Two main implications can be offered based on the results. First, there is a need to integrate innovations in AI and use them to promote university education in the Kingdom of Saudi Arabia. Second, there is a need to enhance national human capabilities in AI and to construct a highly productive knowledge economy by furnishing students with future skills.

Data Availability

No empirical data were used for this study. Only published articles were used for this study.

Conflicts of Interest

The author declares no conflicts of interest.

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