

The future of university education in light of the fourth industrial revolution requirements

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Abstract: The current study aimed to clarify the internal requirements that enable Prince Sattam bin Abdulaziz University (PSAU) to enter the Fourth Industrial Revolution (IR4) to discover the variables that help PSAU to achieve global positions. The study used the descriptive method, and the designed questionnaire consisted of 39 items, it was divided in two dimensions that was applied to a sample of the faculty members (100 members), the study presented the faculty members' vision for the university education future in light of IR4 in general; The internal requirements dimension enables PSAU to enter IR4 has the highest average 3.74, followed by the dimension that enables PSAU to achieve advanced positions internationally in light of IR4 and it has an average of 3.46. The results also showed that there were no statistically significant differences due to the impact of the scientific rank, and according to the specialization variable while differences were found due to the gender and years of experience variables. Also, the study presented a proposal launching strategy for the education future at PSAU in light of IR4 to activate PSAU's role to enter IR4 world.

Keywords: The university education future / the fourth industrial revolution / Prince Sattam bin Abdulaziz University.

1. Introduction

The development of technology and the digitalization of the world created a new industrial revolution was called the Fourth Industrial Revolution (IR4) that differs from previous revolutions in its intensity, complexity, and breadth, by its reliance in essence on digital transformation, i.e. the merging of digital technologies and their rapid penetration into the infrastructure of each institution, and IR4 symbolizes to a set of modern technologies, to achieve digital transformation in various fields, especially in the field of learning and education.[1]

In light of the rapid development of the IR4 technologies, many renewable trends have emerged related to the educational process and its components and elements which led to the development of smart, open, and inclusive learning, especially the fourth goal of the Sustainable Development Goals 2030 that is related to ensuring quality, equitable, and inclusive education for all. The promotion of lifelong learning opportunities for all and the potentials inherent in IR4 technologies and their uses in education, artificial intelligence, virtual reality, augmented reality, cloud computing technology, the Internet of things, robotics, open educational resources, social networks, large data, learning analytics, coding, ethics, and privacy protection.[2]

According to the changes, IR4 imposes a kind of radical change in the structure of higher education and its strategies which results in the emergence of new universities characterized by a diverse and hypothetical nature where they will conduct teaching and scientific research operations hypothetically, and this is what distinguishes what has been termed as the fourth generation of education or in short Education 4.0. One of the most important technological developments that education is based on 4.0 is the use of artificial intelligence, machine learning, learning analytics, and open and lasting learning to provide students with continuous and flexible learning that is compatible with their needs and interests, thus making learning more effective, motivating and enjoyable.[3]

The increasing development in the types of education enhanced by the technologies of IR4, and the implementation of the Kingdom's vision 2030 which pays great attention to expanding the base of innovation and employing technology in education, the universities of the future will start to play their creative role in various aspects and aspects of academic scientific knowledge and these new universities can't adapt to IR4 data, but can also participate in achieving it and directing its paths in creativity and innovation. Therefore, it has become necessary to launch a future strategy for the development of education at PSAU, according to which the university's role can be activated to enter the IR4 world.

2. Literature Review

Several surveys have been thus far fulfilled in line with the main objectives of the present study. For example, The study of Richert et al, (2016) [4] emphasized the need for tomorrow's teachers for technological competencies to interact with students, rethinking targeted learning outcomes, teaching, learning, and evaluation processes, and the study recommends strengthening the roles of all soft skills that develop the ability to solve problems with a virtual work team and working in joint teams of humans and machines together,

while the study of Abdel Razek's (2019) [5] clarified the global and local challenges that it imposed on Egyptian public universities and monitoring the extent of educational policy response, and the study reached to develop alternative scenarios for developing the Egyptian government universities' learning policies in response to the challenges of IR4.

In the same context, the study of Abu Labhan (2019) [6] identified the conceptual framework of IR4 and the most important features of fourth-generation universities and the requirements for their transformation.

Al-Shehri& Al-Saadoun (2019) [7] researched the reality of the relationship between IR4 and the educational outcomes from the viewpoint of the faculty members of the General Organization for Technical and Vocational Training, and the study recommended the development of soft skills among students in line with the requirements of IR4 and the establishment of mutual bridges of communication between educational institutions and the labor market while Al-Dahshan& Al-Sayed (2020) [8] proposed a vision for transforming Egyptian universities into smart universities in light of the universities' digital transformation initiative from the viewpoint of some Egyptian universities faculty members, and the study concluded that the

most important requirements for transforming Egyptian universities into smart universities are elements of Smart humanity-digital vision- smart infrastructure- smart management, Al-Dhubiani (2020) [9] aimed to develop the university education institutions in the Kingdom of Saudi Arabia in light of the requirements of IR4, and the study proposed a strategic vision through which action plans could be developed through continuous improvement in administrative procedures through digitizing administrative work and refining human capital skills to keep pace with Saudi universities requirements of IR4.

Whereas Al-Dahshan& Hamad (2020) [10] presented scenarios to predict the future of the higher education system in light of IR4 challenges by identifying the key variables for the higher education system in Egypt using the MicMac and Mactor methods through the educational experts' viewpoint, and the study predicted a structure of the higher education system future while Al-Dahshan& Jad Allah (2020) [11] proposed the requirements for the e-governance application at Assiut University in light of the IR4, and defined the reality of applying e-governance and the obstacles that prevented its implementation of electronic governance at Assiut University in light of the IR4.

Llale & Wembe (2020) [12] identified the opportunities and threats that IR4 present to professions, and what the direct impact of associated technologies IR4 as Artificial Intelligence (AI), Robotics, and the Internet of Things (IoT) for professions in South Africa, and the study found that AI performs professional tasks faster and higher quality than the professional specialists, and the application of IR4 works to increase investments in the vocational sector, especially in Africa.

Al-Dahshan& Samhan (2020) [13] proposed a vision for developing the necessary skills for future careers and jobs in light of IR4, and the study presented the necessary skills to prepare for future careers and jobs in light of the IR4, and that the requirements for its development are the university environment, the faculty member, educational curricula, in addition to, the university student and the partnership between PSAU and the productive and industrial institutions.

3. Methodology

3.1 Study Sample

The study relied on the descriptive-analytical, and the strategy method to achieve the study main aim and its sub-objectives (Nasr, 2014) [14] to present a strategy for the future education in light of IR4 requirements, and the study sample consisted of 100 faculty members at PSAU from various disciplines, as it is explained in the following table:

Table 1. The Distribution of faculty members according to the study variables

Variable	Categories	frequency	Percentage
Scientific rank	Assistant professor	65	65.0
	Associate professor	23	23.0
Specialization	Professor	12	12.0
	Scientific	36	36.0
	Theoretical	64	64.0
Gender	Male	36	36.0
	Female	64	64.0
Experience years	Less than 5 years	11	11.0
	From 5 to 10 years	43	43.0
	More than 10 years	46	46.0
Total		100	100.0

3.2 Research Tool

A questionnaire was used as the main research tool; constructed and developed based on previous studies and the theoretical framework of the study as well as consultations with experts. The respondents' answers to the questionnaire items were also classified according to a five-point Likert-type scale, wherein the responses were determined in line with their weights as follows: *very large degree (5 points), a large degree (4 points), a moderate degree (3 points), a low degree (2 points), and a very low degree (1 point)* (Allen & Seaman, 2007). [15]

3.3 Validity and Reliability of the Research Tool

To ensure the validity of the main research tool, it was given to some faculty members as referees to verify the suitability of its items to the objectives, and its reliability coefficient was further measured according to the Cronbach's alpha method to ensure the internal consistency in its final form. The value of the reliability coefficient was reached 0.93, and it was 0.92, 0.91 for the first, and the second dimensions. These ratios were also high, indicating consistency between the research tool items.

3.4. Statistical Analysis

To address research questions, descriptive and analytical statistical methods were recruited, using the SPSS statistical software and the following methods.

- Frequency and percentage (to describe the characteristics of the study samples)
- Arithmetic means and standard deviation (SD).

4. Results and Discussion

4.1. Results Related to the First Research Question

- What are the internal requirements that enable PSAU to enter IR4?

Table 2. Arithmetic averages and SD of sample individuals 'estimates of the internal requirements that enable PSAU to enter IR4

Item No.	Field	Mean	SD	Range	level
1	Faculty member	3.83	0.62	1	High

3	Infrastructure	3.80	0.63	2	High
2	PSAU leadership	3.58	0.53	3	High
internal requirements of PSAU		3.74	0.49	High	

It is clear from the previous table identifying the internal requirements that enable PSAU to enter IR4 were a “faculty member” and “infrastructure” obtained a high score with the highest arithmetic average of 3.83, 3.80 due to the ability of those requirements to enhance challenges of IR4 while PSAU leadership came in the last place with an average of 3.58 which confirms that PSAU leadership’s ability to support IR4 competitiveness is not of a high degree. The effective and principal internal affairs which come in the forefront (faculty member, infrastructure) indicate PSAU’s ability to dynamically work together to enhance its strategic objectives in the face of IR4 active forces. Arithmetic averages and SD were calculated for the estimates of the study sample on the items of each domain separately, as the following:

4.1.1 The faculty member

Table 3. The arithmetic averages and SD of the items related to the faculty member arranged in descending order

Item No.	Items	Mean	SD	Range	Level
3	PSAU provides continuous professional development programs and modern learning methods	4.05	0.78	1	High
1	PSAU faculty possess the skills of interactive teaching with students	3.96	0.63	2	High
4	PSAU is building a distinguished team to deliver lectures using digital technologies	3.87	0.80	3	High
5	PSAU provides workshops to achieve scientific communication between students and faculty members	3.86	0.92	4	High
2	PSAU employs education programs based on information and communication technology	3.42	1.09	5	High
The faculty member		3.83	0.62	High	

Table 3 shows that the arithmetic averages ranged from 3.42 to 4.05. Item 3 which states that “PSAU provides continuous professional development programs and modern learning methods” came first, with an arithmetic average of 4.05, with a high degree of application. This may be attributed to the fact that professional development and the development of its processes and individuals are an important tool for achieving the role that the Kingdom's Vision 2030 assumes for the education system, and it is also linked to PSAU's strategic goals which come in the forefront of creating and sustaining high-quality education as stipulated in the regulations. Institutional accreditation standards for the National Center for Academic Accreditation and Assessment in the Kingdom are based on several criteria related to professional growth including “the institution provides effective programs to prepare and train the faculty and new employees.” This result is consistent with Al-Shehri& Al-Saadoun (2019) [7], while item 2 which is "employing PSAU ranked last in education programs based on information and communication technology with an arithmetic average of 3.42. This result is due to the need for faculty members to employ technical knowledge and skills more efficiently and effectively. The information environment at present is complex, and workers can only benefit from modern technology in professional development and self-learning. Universities in the Kingdom have succeeded in adopting modern information systems, but they are still unable to employ them as required, due to workers ’inability to adapt to the new electronic environment. This result is consistent with Al-Dahshan& Samhan (2020). [13]

4.1.2 Infrastructure (buildings- laboratories- laboratories- libraries)

Table 4. The arithmetic averages and SD of the items related to the infrastructure in descending order

Item No.	Items	Mean	SD	Range	Level
13	PSAU has a deepening of the technological system reforms by breaking down barriers to innovation.	4.14	0.74	1	High
12	PSAU provides high-speed internet for all units in the colleges.	4.02	0.75	2	High
11	PSAU invests in digital infrastructure such as broadband communications.	3.66	0.96	3	High
14	PSAU provides internet services in the library for all target scientific groups.	3.61	0.98	4	High
15	PSAU provides the most modern laboratories equipped with electronic devices.	3.55	1.05	5	High
Infrastructure		3.80	0.63	High	

Table 4, shows that the average approval of the sample members about the terms of this field as a whole reached 3.80 which is a high percentage that confirms the availability of the internal requirements for entering IR4. Achieving all the expressions of this dimension with a high degree confirms the need to provide information networks with high speeds that connect all information networks at PSAU, indicating the importance of internal information networks at PSAU in building indicators of digital availability and access to information quickly and efficiently and its effective role in digital transformation in all its forms. The results of that study, agreed with Al-Dahshan& Jadallah (2020).[11] That emphasized the weakness of the infrastructure in many colleges of Assiut University that represents the most important aspects of supporting the technology process.

4.1.3 The university leadership

Table 5. The Arithmetic averages and SD of the items related to PSAU leadership arranged in descending order

Item No.	Items	Mean	SD	Range	Level
7	PSAU provides accountability, transparency, and good governance.	3.74	0.72	1	High
6	PSAU leaders have a comprehensive strategic outlook in various sectors through systematic monitoring and objective evaluation.	3.69	0.76	2	High
10	PSAU leadership is keen to send scholarships to develop information and communication technology and the knowledge society.	3.66	0.82	3	High
9	Leadership provides support to workers to solve problems in the digital work environment.	3.43	0.74	4	High
8	PSAU holds protocols with international universities to take advantage of its technical progress.	3.37	0.87	5	Medium
	PSAU leadership	3.58	0.53		High

Table 5 shows that the arithmetic averages ranged from 3.37 to 3.74. Item 7 which states “PSAU provides accountability, transparency, and good governance” came first, with an arithmetic average of 3.74. This is due to PSAU’s tendency to apply the principles of governance by moving towards centralization whereby the governance of university institutions is based on several foundations, the most important are transparency, participation, and accountability, and working towards empowering colleges and departments to manage their material and human resources. Accountability is a tool to guide behavior and continuous improvement, and this is what happens in IR4 of Collaboration between officials and the public in sharing best practices, so the development of university education is not complete in the absence of governance for its institutions, and setting standards and governing mechanisms for the performance of all parties, and this result is consistent with everything that came in the study of Al-Dahshan& Jadallah (2020) [11]; Ali (2020) [16], while item 8 states that “PSAU holds protocols with international universities to benefit from its technical progress” came last, with an arithmetic average of 3.37 which confirms that it does not represent a major struggle for the university, as its human resource possesses the ability to improving soft skills that are not available in the techniques of IR4, as well as PSAU's ability to develop the technological infrastructure, and this result differs with the Al-Shehri& Al-Saadoun (2019).[7] The study recommended the necessity of establishing reciprocal bridges of communication between international universities and the labor market.

4.2. Results Related to the Second Research Question

- What are the variables that enable PSAU to achieve international advanced positions in light of IR4?

Table 6. Arithmetic averages and SD in light of IR4

Item No.	Items	Mean	SD	Range	Level
1	Academic programs and courses	3.61	0.56	1	High
2	Scientific Research	3.58	0.75	2	High
4	Smart services	3.54	0.52	3	High
3	PSAU students	3.13	0.71	4	Medium
	variables that enable PSAU to achieve international advanced positions	3.46	0.54		High

Table 6 shows that the arithmetic averages ranged from 3.13 to 3.61 where the first variable "academic programs and courses" came in first place with the highest arithmetic average of 3.61 which is the link between the faculty member and the student that enables the knowledge transfer to the student in an electronic form that he can reach anywhere, and also supports electronic communication and mutual interaction. This indicates that it is a very important variable in predicting the future of higher education, and the "scientific research" variable came in second place with an average calculation of 3.58 which confirms the importance of Scientific research to meet the challenges of IR4 while "smart services" got an arithmetic average of 3.54 that indicates the importance of the technological physical structure for the application of IR4 techniques. Smart services are a future variable that confirms PSAU’s need for more financial resources to establish an infrastructure, technology, and programs for an interactive educational environment, and in the last place came the variable " PSAU students" with a moderate degree, and this can be explained by the traditional preparation of students at PSAU which requires the need to reconsider the practices the educational method at PSAU that enables students to provide them with future skills in light of the IR4 requirements, and it is expected that PSAU will achieve advanced centers globally in light of IR4 through the interaction between those variables, and the arithmetic averages, and standard deviations of the estimates of the study sample individuals were calculated on each domain item, where it is as follows:

4.2.1 Academic programs and curricula: -

Table 7. The arithmetic averages and SD of the items related to academic programs and curricula arranged in descending order

Item No.	Items	Mean	SD	Range	Level
16	PSAU uses social networks in educational fields.	3.83	0.83	1	High
19	PSAU adheres to international standards for college programs and designs them according to market needs.	3.75	0.83	2	High
17	PSAU employs the technologies of IR4 in education to keep pace with technology.	3.64	0.73	3	High
21	PSAU provides quality teaching through cloud computing.	3.50	0.71	4	High
18	PSAU is working with companies to push the new skills needed in the courses.	3.47	0.73	5	High
20	Computational thinking skills to solve complex problems are integrated into PSAU's various programs.	3.47	0.74	5	High

Academic programs and curricula	3.61	0.56	High
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Table 7 shows that the average approval of the sample members of this field expressions as a whole reached 3.61 with a high degree of application which requires restructuring educational programs to allow the courses study that fit the student’s requirements and abilities while enhancing inter-learning and working to integrate life skills into the curricula study through communication with stakeholders, including industry, society, and entrepreneurial networks, and with digital transformation and robots, new professions will be created, which requires new programs and curricula in universities, such as; Information specialist, robot programmer, software engineer, and cybersecurity technicians, and those professions spend qualifications, specialized skills, digital skills in addition to, soft skills, and Al-Dahshan& Samhan (2020) [13] who emphasized that soft skills as the main factor in dealing with the transformations of IR4. These skills include flexibility, curiosity, adaptation, critical thinking, communication skills, and teamwork.

4.2.2 Scientific research

Table 8. The arithmetic averages related to scientific research are arranged in descending order

Item No.	Items	Mean	SD	Range	Level
24	There is a publicly documented database of scientific research.	3.78	0.97	1	High
23	There is significant growth in PSAU's environmental research output in science and technology.	3.77	0.88	2	High
26	PSAU uses digital applications to protect the intellectual property rights of faculty members.	3.46	0.91	3	High
22	PSAU offers a reward for research excellence to motivate its members to publish research.	3.45	0.88	4	High
25	PSAU publishes research results on its websites.	3.43	0.91	5	High
Scientific research		3.58	0.75	High	

Table 8 shows that the arithmetic averages ranged from 3.43 to 3.78, and the approval of faculty members on the importance of supporting scientific research is evident through the creation of a documented database, the growth of research production at PSAU in the fields of science and technology and rewards for research excellence, in addition to the importance of emphasizing the faculty members cooperation and the scientific experiences exchange through social media and websites, and emphasizing the importance of protecting their intellectual property rights, and the arithmetic average for scientific research as a whole reached 3.58 with a high degree of application which confirms the importance of the scientific research role to keep pace with IR4, these results are consistent with the study of Al-Shehri& Al-Saadoun (2019).[7]; Abdel Razek (2019) [5] emphasized the universities’ interest in providing students with scientific research skills through Internet use while the study of Al-Dhubiani (2020) [9] emphasized the universities’ role in protecting the members Teaching staff intellectual rights.

4.2.3 Smart services

Table 9. The arithmetic means and SD of the items related to smart services, arranged in descending order

Item No.	Items	Mean	SD	Range	Level
33	PSAU is building smart classrooms equipped with technologies	3.70	0.81	1	High
38	PSAU offers data security and anti-virus programs.	3.68	0.80	2	High
35	PSAU supports mobile applications by placing educational content on them	3.62	0.84	3	High
34	PSAU has smart, tangible devices that allow communication between PSAU employees via the Internet	3.56	0.79	4	High
36	PSAU is building a special team to prepare a digital strategy	3.49	0.78	5	High
39	PSAU offers an initiative for digital technology innovation	3.44	0.70	6	High
37	PSAU supports the participation of productive institutions by communicating with alumni	3.31	0.84	7	medium
Smart Services		3.54	0.52	High	

Table 9 shows that the arithmetic averages ranged from 3.31 to 3.70 and that the faculty sample members agree on the statements included in this dimension with a high degree with a mean of 3.54, and this can be explained by the sample members. They agree on the importance of having smart services of PSAU from smart buildings and technologies while continuing to develop them to be compatible with PSAU achieving advanced centers globally in light of IR4 requirements, and this result is consistent with what was stated by the study of Al-Dahshan& Elsayed (2020) [8] clarified the necessity of providing the Smart infrastructure to raise the educational process and work level to continuously develop it to achieve integrated development and keep pace with scientific progress and to achieve global university competition, and both Abu Labhan (2019) [6]; Al-Shehri& Al-Saadoun (2019) [7] emphasized the necessity for universities to make changes in learning to keep pace with IR4 requirements.

4.2.4 PSAU students

Table 10. The arithmetic means and SD of the items related to PSAU students, arranged in descending order

Item No.	Items	Mean	SD	Range	Level
29	PSAU is concerned with preparing the university student to be a producer of knowledge.	3.70	0.97	1	High
27	PSAU provides students with cross-cultural research by	3.60	0.76	2	High

	fostering shared learning opportunities.				
28	PSAU launches international study programs in partnership with international universities.	3.29	0.84	3	Medium
32	PSAU provides enrollment for students in lifelong educational programs.	2.95	0.87	4	Medium
31	PSAU launches an international program to enable students to travel to implement their projects.	2.88	0.95	5	Medium
30	Every student has a tablet computer equipped with PSAU's software applications.	2.37	0.98	6	Low
Students' PSAU		3.13	0.70	Medium	

Table 10 shows that the average approval of the sample members about PSAU students items, as a whole was 3.13, with a moderate degree of application, and item 30 that states “Each student has a tablet computer equipped with PSAU’s software applications” ranked last, with an arithmetic average of 2.37 while the items 27, 28, 29, 31& 32 came with responses that confirm PSAU's ability to achieve advanced positions in the light of IR4 in an average manner, as the arithmetic averages ranged from 2.37 to 3.70 which requires PSAU to refine students' abilities, and their skills to make them more adaptive to IR4 requirements through training, activating virtual classes, social networking sites, and their possession of technological skills. These results are consistent with the findings of Richert et al (2016) [4] emphasized that education and industry are the way to achieve IR4 and that the challenge in preparing students lies in dealing with IR4.

4.3 Results Related to the Third Research Question

- Are there statistically significant differences between the responses of the study sample at the level of 0.05 between the averages of the sample individuals 'estimates towards the internal requirements of PSAU due to the study variables?

Table 11. The arithmetic averages and SD of the internal requirements of PSAU according to the variables of scientific rank, specialization, gender, years of experience

Variables	Categories	No.	Arithmetic Rank	SD
Scientific rank	Assistant professor	65	3.86	0.48
	Associate professor	23	3.54	0.48
Specialization	professor	12	3.43	0.26
	scientific	36	3.83	0.52
	theoretical	64	3.68	0.47
Gender	Male	36	3.47	0.37
	Female	64	3.88	0.49
Experience years	Less than 5 years	11	3.44	0.35
	From 5 to 10 years	43	3.78	0.43
	More than 10 years	46	3.77	0.55

Table 11 shows an apparent variation in the arithmetic averages and SD of the internal requirements of PSAU due to the different categories of scientific rank, specialization, gender, and years of experience variables and to demonstrate the statistical significance of differences between the arithmetic averages, the quadruple variance analysis was used, Table 12 was used.

Table 12. Interdisciplinary analysis of the effect of scientific rank, specialization, gender, and years of experience on the internal requirements of PSAU

The source of the contrast	Sum of squares	Freedom degrees	Squares means	F value	Statistically significant
Scientific rank	0.66	2	0.33	1.86	0.161
Specialization	0.47	1	0.47	2.66	0.106
Gender	2.25	1	2.25	12.62	0.001
Years of experience	2.09	2	1.04	5.86	0.004
Error	16.58	93	0.18		
Quantity	23.83	99			

Table 12, Shows that there are no statistically significant differences $\alpha= 0.05$ due to the effect of the scientific rank where the F value was 1.86 and with a statistical significance of 0.161 as well as the absence of statistically significant differences $\alpha= 0.05$ attributable to the effect of Specialization with a value of 2.66 and a statistical significance of 0.106. This is because all faculty members of various scientific ranks and theoretical and scientific specializations have agreed on the importance of internal requirements that enable PSAU to enter IR4, Whereas, there were statistically significant differences $\alpha= 0.05$ attributed to the effect of gender, where the value of p 12.62, with a statistical significance of 0.001, and the differences came in favor of females, and this is because females realize the importance of internal requirements that enable PSAU to enter IR4, they are keen to train themselves on technology or obtain specialized training courses, and they are more in contact with the tools of IR4 due to the changes occurring in society, which are indicated by Abdel Razek (2019)[5]; Abu Nabhan (2019)[6]. As well as the existence of statistically significant differences $\alpha= 0.05$ attributed to the impact of years of experience where F value is 5.861. In statistical terms, it amounted to 0.004, and the statistically significant differences between the arithmetic mean using the dimensional comparisons were used in a curated way, as shown in Table 13.

Table 13. Dimensional Comparisons by chef it way of the experience years on PSAU internal requirements

Categories	Mean	Less than 5 years	From 5-10 years	More than 10 years
Less than 5 years	3.44			
From 5-10 years	3.78	.33*		
More than 10 years	3.77	.32*	.01	

A significance level at $\alpha = 0.05$

Table 13. shows that there are statistically significant differences $\alpha= 0.05$ between less than 5 years on one hand and each of 5-10 years, and more than 10 years on the other hand and the differences came in favor of each of 5- 10 years, and more than 10 years and this is because faculty members whose experience is from 5-10 years, and more than 10 years have more experience than faculty members who are less than 5 years, they understand the more aware of the importance of the internal requirements that enable PSAU to enter IR4, and the extent of its availability, as a result of the experiences they went through during teaching and research and attending conferences and workshops, a more experienced understanding of the importance of these requirements and the necessity of their availability. So that it matches the current data which is consistent with Rasa Al-Dahshan& Samhan (2020). [13]

4.4. The proposed strategy for the future of education at PSAU in light of IR4

The strategy reflects the vision and the operational goals to meet the challenges of IR4, as well as the variables that enable PSAU to achieve advanced positions globally in light of IR4 and to achieve its strategic goal that characterized by some justifications, including the Kingdom’s endeavor to develop a digital transformation plan in line with the Kingdom's vision 2030 and meeting IR4 requirements, taking steps to transform Saudi universities into smart universities in light of digital transformation initiatives, and doubling PSAU's competitive capabilities in technology, knowledge, and innovation. The dimensions of the proposed strategic plan include the following:

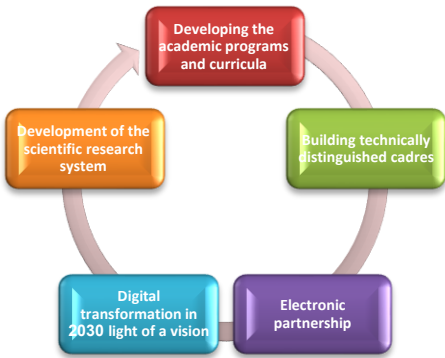


Fig 1The

dimensions of the proposed strategic plan for developing education at PSAU in Light Of IR4

Developing academic programs and courses to provide graduates with technical skills, in which a series of workshops are offered to acquire basic knowledge and skills in technology, launching a lifelong learning initiative, preparing programs to activate semester activities, and broadcasting them via the web to enhance distance education, and publishing educational content on the site to enable students and teacher discussion at any time.

Building technically distinguished cadres at PSAU by setting up a system to increase some foreign scholarships, activating international agreements for faculty exchange abroad, accrediting faculty development centers internationally, and digital training for all university employees to develop their digital skills.

Electronic partnership with industry and production sectors, in which PSAU seeks to the electronic partnership by linking graduates with employment institutions for the labor market locally and regionally, launching start-ups, business incubators, technology parks, and community centers that enhance learning, and PSAU's role as a mediator between young entrepreneurs and sponsor supporters.

Developing a digital transformation plan in line with the Kingdom's vision 2030 through the transformation from the traditional university model to the fourth-generation university, building smart classrooms, supporting the nation's smart initiatives to build digital leadership, and focusing on innovation, and entrepreneurship through programming.

Developing the scientific research system at PSAU by launching the research excellence initiative, increasing international scholarship programs, strengthening cooperation between pioneering research in various disciplines, and concluding international agreements and partnerships to attract researchers in all countries of the year to lead intellectual exchange and cooperation, the study suggests that the period for implementing the proposed strategy should be continuous and indefinite to face the rapid technological changes, and employ technologies for IR4.

5. The Conclusion

The study concluded that the arithmetic average of the overall tool for internal requirement paragraphs that enables PSAU to enter IR4 from a faculty point of view came with a high degree. While the arithmetic average of the overall tool of variables that enable PSAU to achieve advanced positions globally in the light of IR4 from the point of view of the faculty members of PSAU came to a high degree, the study also showed that there are no statistically significant differences depending on the scientific grade and specialization variables and there are differences in the gender variable, and the differences came in favor of females, and the variable years of experience came in favor of both 5-10 years, and more than 10 years.

Recommendation based on the above results:

- 1. Creating programs and specializations commensurate with the requirements of IR4, and adapting graduates to deal with the labor market.
- 2. Preparing the infrastructure, including information and communication devices, and digitizing administrative work.

3. PSAU devised a research plan that takes into account the requirements of IR4 and links scientific research with the production sectors in the country.

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