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Article

Requirements for Improving the Scientific Productivity of Educational Institutions to Enhance the Sustainability of Human Resources: An Analytical Study at Cordoba Private University

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Abstract: This research aimed to analyze the impact of requirements for improving scientific productivity in educational institutions on enhancing human resource sustainability at Cordoba Private University. This stems from the importance of providing a supportive research environment that contributes to developing scientific performance, retaining human talent, and ensuring the sustainability of its contributions. The requirements for improving scientific productivity were defined in five dimensions: institutional support for scientific research, research funding, a system of incentives and scientific recognition, research guidance and mentorship, and electronic information resources and knowledge infrastructure. Human resource sustainability, on the other hand, was defined in three dimensions: social sustainability, psychological sustainability, and environmental sustainability. The research adopted a descriptive-analytical approach, and a questionnaire was used as the primary data collection tool from Cordoba Private University's academic, teaching, and administrative staff involved in scientific and research activities. Fifty-eight (58) questionnaires were valid for statistical analysis out of a total of sixty-five (65) distributed, representing a validity rate of 89.23%. The data were analyzed using structural equation modeling with the SmartPLS software. The results showed that the availability of requirements for improving scientific productivity was high, with a mean score of 3.70. Electronic information resources and knowledge infrastructure ranked first, while research funding ranked last. Human resource sustainability also achieved a high level, with a mean score of 3.71. Social sustainability ranked first, while environmental sustainability ranked last. The results demonstrated a statistically significant positive impact of requirements for improving scientific productivity on human resource sustainability, with a path coefficient of $\beta = 0.585$ and a coefficient of determination ($R^2 = 0.342$). This means that requirements for improving scientific productivity explain 34.2% of the variance in human resource sustainability. The research concluded that there is a need to increase attention to research funding, develop a system of incentives and scientific recognition, continue supporting electronic information resources and knowledge infrastructure, and promote practices related to the psychological and environmental sustainability of human resources to support sustainable academic and research performance at the university.

Keywords: Requirements for improving scientific productivity, Human resource sustainability, Cordoba private university

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1. Introduction

The higher education sector is undergoing rapid transformations as a result of scientific and technological advancements and the expansion of the knowledge economy. This has made scientific productivity a key indicator in evaluating the efficiency of educational institutions and their ability to produce knowledge and develop society. A university's standing is no longer solely linked to the quality of its educational process, but also to the volume and quality of its scientific output, and its capacity to support researchers and provide an organizational and knowledge-based environment that encourages research, publication, and innovation.

Improving scientific productivity requires a set of organizational, material, and knowledge-based requirements that enable faculty and researchers to perform their research roles effectively. These include institutional support for scientific research, research funding, a system of incentives and scientific recognition, research guidance and mentorship, and access to electronic information resources and a robust knowledge infrastructure. The availability of these requirements contributes to creating a stimulating research environment, reducing obstacles facing researchers, and enhancing their ability to produce high-quality scientific output with both scientific and applied value.

Modern human resource sustainability, as reflected in existing literature, focuses on reducing and developing human capabilities. Furthermore, educational organizations are active in the workforce, possessing knowledge, sharing it, and developing it. Achieving sustainability prevents negative social, psychological, and environmental impacts in modern settings.

The importance of this research lies in its examination of the relationship between the requirements for improving scientific productivity and the sustainability of human resources. This is achieved through a supportive environment that fosters a sense of security and stability among faculty and researchers, thereby increasing activity and practical output, reducing work-related stress, and providing the necessary conditions for a high quality of work life, thus supporting their ability to contribute further to scientific advancement. The current research, titled "Requirements for Improving Scientific Productivity in Educational Institutions to Enhance Human Resource Sustainability: A Case Study of Cordoba Private University," aims to diagnose the current state of requirements for improving scientific productivity, determine their contribution to enhancing human resource sustainability in all its dimensions, and offer recommendations that can contribute to developing the research environment and supporting sustainable institutional performance within the organization under study.

2. Materials and Methods

The Research Problem

Currently, educational institutions face challenges in improving their scientific productivity and ensuring the sustainability of their human resources. Given the dynamic developments in all fields, particularly knowledge and technology, further efforts are required to guarantee academic quality and excellence. Strengthening these requirements enables universities to enhance their performance in scientific research. These requirements include providing financial support for researchers to complete their studies and ensuring the availability of knowledge infrastructure. Human resource sustainability in educational institutions focuses not only on job security but also on providing a supportive social and psychological environment and infrastructure that helps employees perform at their best with efficiency and effectiveness. Therefore, it is necessary to study this phenomenon: to what extent do the requirements for improving scientific productivity contribute to enhancing human resource sustainability within the university environment? The main research question can be formulated as: To what extent do the requirements for improving scientific productivity in educational institutions contribute to enhancing human resource sustainability at Cordoba Private University?

The Importance of the Research

The significance of this research lies in its examination of recent developments in business administration and their active role in identifying requirements for improving scientific productivity and supporting academics in performing their duties optimally, as well as the importance of human

resource sustainability in developing their capabilities and efficiency. This significance can be summarized in the following points.

1. Improving scientific productivity is a fundamental pillar in developing academic and research performance in educational institutions.
2. Attention to institutional support, research funding, incentives, scientific recognition, research guidance and mentorship, electronic information resources, and infrastructure motivates academics to produce scientific work.
3. The sustainability of human resources and its dimensions can play a role in maintaining a competent workforce, ensuring its long-term continuity.
4. This study demonstrates the impact of improving scientific productivity on the sustainability of human resources at the university under study.
5. This study assists the administration of the university under study in identifying the requirements that contribute to enhancing the sustainability of its human resources, thus ensuring appropriate and efficient decision-making.
6. Providing findings and recommendations that can be utilized in developing the research environment, improving the quality of academic performance, and achieving institutional sustainability.

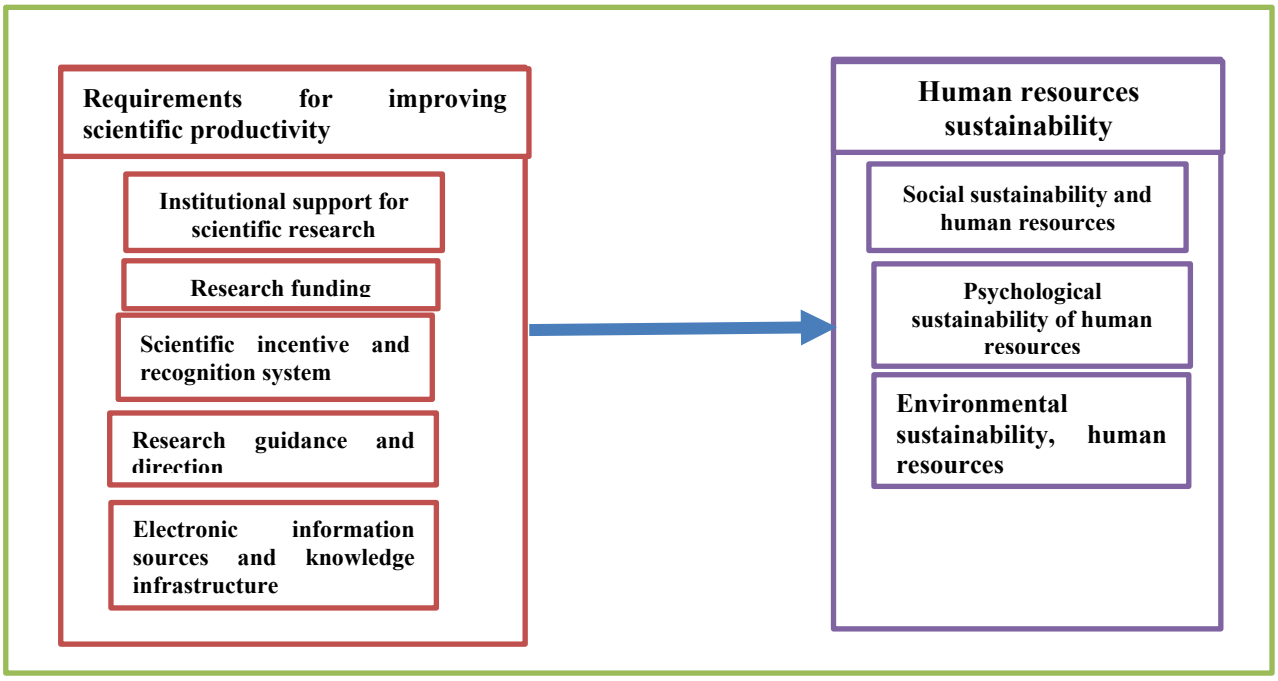

Figure (1) Hypothetical research plan

Research Hypotheses

Main Hypothesis: There is a statistically significant effect of the requirements for improving scientific productivity on the sustainability of human resources at Cordoba Private University.

Section Two: Improving the Scientific Productivity of Educational Institutions

First: The Concept of Improving the Scientific Productivity of Educational Institutions

Improving scientific productivity refers to building research capacity at the individual, organizational, and collaborative levels through the professional development of researchers, providing supportive policies, structures, and organizational culture, and establishing collaborative research networks both within and outside the institution [1]. According to Aithal (2016), improving scientific productivity in educational institutions means increasing the institution's capacity to produce new knowledge through the active participation of faculty members and students in research activities and projects, and transforming their results into scientific research and publications, thereby enhancing the institution's research performance and scientific standing [2]. Olvido (2021) defines

improving scientific productivity as the gradual transition of an educational institution from simply conducting research and writing reports to producing high-quality research suitable for international publication and scientific citation, through investment in people, resources, and research activities, and the sustained improvement in the quality of scientific output [3]. According to Frantz et al. (2022), improving scientific productivity involves adopting a set of institutional policies, practices, and initiatives that cultivate a research culture, increase research capacity and the output of scientific research, provide a suitable administrative structure, and support scientific publishing and research performance management [4]. De Jongh et al. (2023) view improving scientific productivity as an institutional process aimed at creating an enabling environment for scientific research through the establishment of research units and centers, the development of a critical mass of researchers, the promotion of interdisciplinary collaboration, and the provision of graduate programs, professional development, and internal and external support [5]. Improving the scientific productivity of educational institutions can be defined as the level of efforts, policies, and practices adopted by the institution to develop the research capabilities of its members, and to provide the necessary environment, resources, incentives, and partnerships. This leads to an increase in the number of research papers and scientific publications, and an improvement in their quality and impact. This is measured through the responses of the sample members to the items of the scale designed for the study.

Second: The Importance of Improving the Scientific Productivity of Educational Institutions

Hesli & Lee (2011) explained that the importance of scientific productivity for faculty members and educational institutions is directly reflected in the following aspects :[6]

1. Achieving professional advancement for academics; scientific productivity influences the development and advancement of faculty members within the academic field.
2. Enhancing the researcher's scientific reputation within the academic community; the volume and quality of published research reflect the researcher's activity level and scientific standing.
3. Raising the profile of the academic department; faculty members' research and publications contribute to enhancing the reputation of their department.
4. Strengthening the position and reputation of the educational institution, as the scientific productivity of faculty members is reflected in the academic and research prestige of the university or educational institution.
5. .Evaluating the performance of faculty members, as scientific publication records are an important factor in assessing the academic and research performance of faculty members.
6. Increasing opportunities to obtain research grants, as publications and research records are taken into consideration when awarding funding and research assistance.
7. Supporting academic promotion decisions, as scholarly output is a key criterion when deciding whether to promote faculty members to higher academic ranks.
8. Influencing decisions related to salaries and bonuses, since scholarly productivity is among the factors affecting academic compensation and incentive decisions.

Third: Dimensions of Requirements for Improving Scientific Productivity in Educational Institutions

The Ocampo et al. (2022) model is considered one of the most suitable because it directly identifies five key institutional factors that lead to improved scientific productivity in higher education institutions: institutional support, incentive systems, research funding, research mentoring, and electronic information resources [7].

1. Institutional Support for Scientific Research: This refers to the level of commitment of an educational institution to providing an organizational and administrative environment that helps faculty and researchers conduct scientific activities. It includes adopting clear research policies, facilitating procedures, supporting research proposals, providing the necessary time for research, and encouraging a research-oriented culture.
2. Research Funding: This refers to the financial resources that the educational institution allocates or obtains from external sources to support research implementation, purchasing supplies,

conducting experiments, collecting data, participating in conferences, and covering scientific publication fees.

3. Reward System: This refers to the set of material and non-material rewards granted by the educational institution to researchers based on their scientific achievements, such as financial rewards, promotions, official recognition, publication awards, and support for conference participation.
4. Research Mentoring: This refers to providing mentoring programs and relationships that help researchers, especially new researchers, develop their skills in topic selection, research design, data analysis, scientific paper writing, choosing appropriate journals, and responding to reviewers' feedback.
5. Electronic Information Resources and Knowledge Infrastructure: These include scientific databases, electronic journals and books, digital libraries, research and statistical software, the internet, and knowledge access systems that researchers need.

Dependent variable: Human resource sustainability

First: The concept of human resource sustainability

Human resource sustainability is defined as the management that achieves long-term social and economic efficiency in attracting, developing, retaining, and managing the departure of employees from the organization [8]. According to Gollan (2005), human resource sustainability is viewed from the perspective of an organization's ability to create, renew, and maintain value and wealth through the application of appropriate human resource management policies and practices [9]. Ehnert (2009) defines human resource sustainability as a pattern of planned or emergent human resource strategies and practices aimed at achieving the goals of the organization and its individuals, while maintaining and renewing the human resource base over a long period and minimizing the negative impacts that work systems may generate on employees and the organization [10]. Kramar (2014) states that sustainable human resource management goes beyond focusing on short-term financial performance to include strategies and practices that achieve financial, social, human, and environmental outcomes, while maintaining the human resource base in the long term [11]. Ehnert et al. (2016) define sustainable human resource management as the development of strategies and practices that enable an organization to achieve its financial, social, and environmental goals, both internally and externally, over a long period, while controlling unintended side effects and negative outcomes of these practices [12] . De Prins et al. (2014) view sustainable human resource management as a form of employee management that is linked to the organization's external environment and is based on respect for employees and achieving a balance between the interests of the organization, its employees, and society. This concept is embodied in three pillars: respect, openness, and continuity [13].

Human resource sustainability can be defined as the ability of an organization to maintain, retain, develop, and renew its human resources, and to provide a fair, healthy, and supportive work environment for their participation and well-being.

Second: The Importance of Human Resource Sustainability

The importance of human resource sustainability, according to the source [14], lies in the following points:

1. Human resource sustainability contributes to organizational stability by reducing employee turnover (resignations or terminations). It also helps retain expertise and knowledge within the organization.
2. It helps increase employee productivity and performance, as trained and motivated employees perform better. A sustainable work environment motivates employees to perform at a higher level.
3. Human resource sustainability contributes to enhancing employee loyalty and belonging. When employees feel valued and respected, their commitment to their work increases. It also contributes to building strong bonds between employees and the organization.

4. It contributes to improving the organization's image. Organizations that prioritize their human resources attract top talent. They also build a positive reputation both locally and globally.
5. It contributes to supporting innovation and development. Investing in education and training opens the door to new ideas and creates happy, confident employees who participate in initiatives and innovate solutions.
6. It helps promote social justice and ethical responsibility by adopting the principles of "decent work" and "equality." It reduces discrimination and supports diversity and empowerment in the workplace.
7. It prepares the organization to face technological and economic changes and helps in workforce planning according to future market needs.

Third: Dimensions of Human Resource Sustainability

According to (Mazur & Walczyna 2020), there are three dimensions of human resource sustainability, which are as follows[15] [16]:

1. **Social Sustainability of Human Resources:** Socially responsible human resource management (HRM) is manifested in treating employees as key stakeholders in the organization. Diversity management will be used to examine the social aspect of sustainable HRM.
2. **Psychological Sustainability of Human Resources**: This dimension focuses on the psychological well-being of employees, specifically what they consider important. Since individuals play a pivotal role in creating a sustainable competitive advantage, understanding and enhancing their motivations is crucial for the organization. Key elements of this aspect of sustainable HRM include work-life balance, autonomy, self-development, and a balanced career path. We will use the latter as an example to examine the psychological aspect of sustainable HRM. A balanced career path differs from the traditional career path, as 20th-century organizations largely relied on an economic model of management.
3. **Environmental Sustainability of Human Resources:** The environmental perspective relates to aspects of HRM that contribute to making the organization more environmentally conscious. This includes activities such as training employees in sustainable development or promoting environmentally friendly behaviors that enhance employee competencies.

3. Results

Chapter Three: The Practical Aspect

First: Description of the Research Population and Sample

The University of Cordoba strives to achieve a set of visions it considers fundamental to continuous excellence. The university aims to prepare qualified academic staff with the skills and knowledge necessary to meet the demands of the job market. It also focuses on developing its academic programs in line with international standards and ensuring the quality and effectiveness of its educational outcomes. The university encourages innovative scientific research by providing a collaborative environment and promoting the use of modern concepts and digital transformation. Among its objectives is also building effective partnerships with academic and industrial institutions to collaborate with leading experts, thus contributing to the development of the skills needed by aspiring professionals. Furthermore, the university contributes to community service through development and awareness initiatives. As part of its pursuit of excellence, the university is committed to adhering to the highest standards of quality assurance and accreditation and to creating a stimulating environment that supports creativity and learning. The University of Cordoba was established in 2024.

The University of Cordoba aspires to be among the leading and distinguished universities at both the local and regional levels and to achieve a prominent position among educational institutions that effectively contribute to knowledge production and community development. The university's vision is based on providing a modern educational model that combines academic quality and innovation, relying on the integration of technology in the educational process to enhance learning outcomes,

develop critical thinking skills, and support scientific research across various disciplines. It also aims to prepare graduates with scientific and practical skills, capable of competing in the local and global job market. The university believes in the importance of strategic partnerships with academic and industrial institutions and strives to develop curricula according to the latest international standards, while establishing a culture of quality and academic accreditation to ensure institutional excellence and sustainability.

The University of Cordoba is committed to providing high-quality education based on the latest scientific theories and practices, with the goal of preparing graduates with in-depth knowledge and practical skills that qualify them to succeed in the job market and contribute to the development of their communities. The university also seeks to provide a stimulating learning environment that supports creativity and innovation, encourages critical thinking and teamwork, and ensures the availability of the necessary resources for faculty members and students to produce sound scientific knowledge. It works to align educational outcomes with the needs of the job market by developing academic programs and integrating practical training into study paths. The university is also keen to build strategic partnerships with local and international institutions to enhance academic performance and exchange expertise. Through this mission, the university aims to achieve a balance between education, scientific research, and community service.

To complete the research process, the researchers distributed (65) questionnaires, of which (60) were valid for statistical analysis.

Table (1) Personal Characteristics of the Research Sample

Variable	Category	Repetition	Percentage%
	Males	36	62.10%
Sex	**Females**	22	37.90%
	the total	58	100%
	Under 30 years	5	8.60%
	30–39 years	16	27.60%
The age	**40–49 years**	22	37.90%
	50 years and over	15	25.90%
	the total	58	100%
	Master's	25	43.10%
Academic achievement	**PhD**	33	56.90%
	the total	58	100%
	Under 5 years	8	13.80%
	5–Under 10 years	15	25.90%
Years of service	**10–Under 15 years**	18	31.00%
	15 years and over	17	29.30%
	the total	58	100%
	Assistant Lecturer	10	17.20%
	Lecturer	19	32.80%
Scientific title	**Assistant Professor**	20	34.50%
	Professor	9	15.50%
	the total	58	100%

According to Table (1), the percentage of males was 62.1%, while females constituted 37.9%. The largest percentage of the sample was in the 40-49 age group, indicating their experience, competence, and ability to produce sound scientific research.

The percentage of those holding a PhD was 56.9%, and those holding a Master's degree was 43.1%, demonstrating the experience and competence of the research sample.

Regarding academic titles, the percentage of Professors was 15.5%, Assistant Lecturers 17.2%, Lecturers 32.8%, and Associate Professors 34.5%, reflecting the diversity of academic titles.

Second: Description of the research tool and measurement scale

The questionnaire was the primary tool for collecting data from the research sample and comprised three sections:

1. Personal data of the research sample.
2. he independent variable: Requirements for improving the scientific productivity of educational institutions, consisting of five dimensions and 25 items.
3. The dependent variable: Human resource sustainability, consisting of three dimensions and 14 items.
4. To measure the responses of the sample, a five-point Likert scale was used. Responses were assigned numerical weights ranging from 1 to 5 as follows: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). This scale was chosen because it is suitable for the nature of behavioral and organizational variables, as well as being easy to use in measuring the attitudes of the sample members and conducting appropriate statistical analyses.

Third: Testing the validity and reliability of the measurement instrument

To ensure the validity of the measurement instrument and its ability to accurately measure the research variables and their dimensions, the measurement model was evaluated using a set of reliability and validity indicators adopted in structural equation modeling using partial least squares (PLS-SEM). These included: Cronbach's Alpha, composite reliability (CR), average variance extracted (AVE), outward loadings, convergent validity, and discriminant validity using the Fornell-Larcker and HTMT criteria.

Reliability and Convergent Validity Testing

The research relied on Cronbach's Alpha coefficient to verify the internal consistency of the items in each dimension. A value of 0.70 or higher is considered an acceptable indicator of reliability. Compound reliability (CR) was also used, and a dimension is considered to have good reliability when its value is greater than 0.70. The mean variance (AVE) was used to verify convergent validity, and its value should be 0.50 or higher, meaning that the underlying variable explains more than half of the variance in its indices.

Table 2. Results of reliability and convergent validity for the research dimensions

Variable	The Dimension	Cronbach's Alpha	CR	AVE	The ruling
Requirements for improving scientific productivity	**Institutional Support for Scientific Research**	0.884	0.916	0.686	acceptable
	Research Funding	0.873	0.908	0.664	acceptable
	Scientific Incentive and Recognition System	0.901	0.927	0.718	acceptable
	Research Mentoring and Guidance	0.861	0.901	0.645	acceptable
	Electronic Information Resources and Knowledge Infrastructure	0.892	0.92	0.697	acceptable
Human resources sustainability	**Social sustainability**	0.887	0.918	0.691	acceptable
	Psychological sustainability	0.905	0.93	0.726	acceptable
	Environmental sustainability	0.872	0.912	0.722	acceptable

Table (2) shows that Cronbach's alpha values ranged from 0.861 to 0.905, all above the acceptable threshold of 0.70, indicating a high degree of internal consistency in the research dimensions. Similarly, composite reliability (CR) values ranged from 0.901 to 0.930, further confirming the high

level of composite reliability of the research measures.

The extracted mean variance (AVE) values ranged from 0.645 to 0.726, all above the acceptable minimum threshold of 0.50, thus confirming the convergent validity of all dimensions of the measurement model.

Outer Loadings

The outer loadings of the measurement instrument items were examined to ensure the strength of each item's correlation with its respective dimension. An outer loading value of 0.708 or higher is considered optimal. Lower values are acceptable to a limited extent when the CR and AVE indices are within acceptable limits and retaining the item does not compromise the quality of the measurement model.

Table 3. Outer Loadings of the Research Dimension Items

Distance	Paragraph	Outer Loading
Institutional support for scientific research	DI1	**0.801**
	DI2	**0.836**
	DI3	**0.849**
	DI4	**0.818**
	DI5	**0.835**
Research funding	**RF1**	**0.792**
	RF2	**0.819**
	RF3	**0.841**
	RF4	**0.806**
	RF5	**0.814**
Scientific incentive and recognition system	**IR1**	**0.832**
	IR2	**0.861**
	IR3	**0.875**
	IR4	**0.846**
	IR5	**0.823**
Research guidance and mentorship	**RG1**	**0.781**
	RG2	**0.807**
	RG3	**0.826**
	RG4	**0.795**
	RG5	**0.806**
Electronic information sources and knowledge infrastructure	**EI1**	**0.815**
	EI2	**0.842**
	EI3	**0.857**
	EI4	**0.824**
	EI5	**0.835**
Social sustainability of human resources	**SS1**	**0.814**
	SS2	**0.839**
	SS3	**0.851**
	SS4	**0.821**
	SS5	**0.83**
Psychological sustainability of human resources	**PS1**	**0.841**
	PS2	**0.867**
	PS3	**0.859**
	PS4	**0.84**
	PS5	**0.852**
Environmental sustainability of human resources	**ES1**	**0.823**
	ES2	**0.851**
	ES3	**0.874**

Distance	Paragraph	Outer Loading
	ES4	**0.85**

The table results indicate that all external loads for the scale items were greater than 0.70, ranging from 0.781 to 0.875, demonstrating a strong correlation between the items and the dimensions they measure. Therefore, there was no statistical need to remove any items from the measurement instrument.

Convergent Validity

Convergent validity is achieved when the indicators of the underlying variable are adequately correlated and capable of explaining a sufficient proportion of the variance in their respective dimensions. The results demonstrated convergent validity based on two key criteria: the external loading of the items exceeding 0.70, and the AVE values for all dimensions exceeding 0.50.

Therefore, the measurement model results confirm that the items used in the research accurately represent their dimensions, and that each dimension is capable of explaining a high proportion of the variance in its indicators, thus providing evidence of the convergent validity of the measurement instrument.

Discriminatory validity according to the Fornell-Larcker criterion

The Fornell-Larcker criterion was used to verify the discriminant validity between the search dimensions, as it is required that the square root of the AVE value for each dimension, located on the main diagonal of the matrix, be greater than the correlation coefficients of that dimension with the rest of the dimensions.

Table 4. Results of the Fornell-Larcker Criterion

Distance	DI	RF	IR	RG	EI	SS	PS	ES
DI	0.828							
RF	0.632	0.815						
IR	0.681	0.658	0.847					
RG	0.614	0.591	0.646	0.803				
EI	0.667	0.623	0.691	0.638	0.835			
SS	0.643	0.602	0.655	0.617	0.672	0.831		
PS	0.625	0.584	0.636	0.608	0.649	0.706	0.852	
ES	0.598	0.571	0.612	0.589	0.628	0.674	0.688	**0.85**

Note: The values in bold on the main diagonal represent the square root of the AVE value for each dimension.

The results show that all square root values of AVE on the main diagonal were greater than the correlation coefficients between this dimension and the other dimensions, confirming sufficient differentiation between the measurement model variables and thus achieving discriminatory validity according to the Fornell-Larcker criterion.

Discritical Validity according to the HTMT Criterion

To further enhance the accuracy of discriminatory validity, the Heterotrait-Monotrait Ratio (HTMT) was used. HTMT values should be less than 0.90, and in more conservative tests, a value less than 0.85 is preferable.

Table 5. Results of the HTMT Standard

Distance	DI	RF	IR	RG	EI	SS	PS	ES
DI	—							
RF	0.698	—						
IR	0.742	0.718	—					
RG	0.682	0.654	0.711	—				

Distance	DI	RF	IR	RG	EI	SS	PS	ES
EI	0.729	0.681	0.748	0.701	—			
SS	0.704	0.665	0.716	0.681	0.731	—		
PS	0.687	0.648	0.699	0.671	0.714	0.768	—	
ES	0.659	0.631	0.674	0.652	0.691	0.737	0.752	—

The table shows that all HTMT values were less than (0.85), ranging between (0.631–0.768), which further confirms that the research dimensions have a high degree of conceptual and statistical differentiation, and there is no problem of high overlap between the underlying variables.

Fourth: Descriptive Analysis of Research Variables

The descriptive analysis aims to identify the level of availability of the research variables and their dimensions from the perspective of the sample members at Cordoba Private University. This is achieved by using the arithmetic mean, standard deviation, relative importance, and response level. Relative importance was calculated by dividing the arithmetic mean by the highest score on a five-point Likert scale (5) and multiplying the result by 100. The research interpreted the arithmetic means according to the following levels: (1.00–1.80) very low, (1.81–2.60) low, (2.61–3.40) average, (3.41–4.20) high, and (4.21–5.00) very high.

4. Discussion

A. Descriptive Analysis of the Variable of Requirements for Improving Scientific Productivity

Table 6. below shows the results of the descriptive analysis of the five dimensions that make up the variable of requirements for improving scientific productivity for educational institutions.

T	Distance	Arithmetic mean	Standard Deviation	Relative Importance %	Answer level: High	Order
1	Institutional support for scientific research	3.82	0.68	76.4	High	2
2	Research funding	3.46	0.79	69.2	High	5
3	Scientific incentive and recognition system	3.61	0.74	72.2	High	4
4	Research guidance and mentorship	3.74	0.7	74.8	High	3
5	Electronic information sources and knowledge infrastructure	3.89	0.64	77.8	High	1
Total Variable	Requirements for improving scientific productivity	3.7	0.71	74.08	High	—

Table (6) shows that the fifth dimension ranked highest, with a mean of (3.89), a standard deviation of (0.64), and a significance level of (74.08%). This indicates the sample's awareness of the availability of electronic information resources and the knowledge infrastructure at the university under study.

The second dimension ranked lowest, with a mean of (3.46), a standard deviation of (0.79), and a significance level of (69.2). This indicates that the university lacked the required level of research funding for researchers.

As for the overall variable, the mean was (3.70), the standard deviation was (0.71), and the relative significance level was (74.08%). This indicates the availability of the requirements for improving scientific productivity at the university under study.

B. Descriptive analysis of the human resource sustainability variable

Table 7. shows the descriptive analysis of the dependent variable.

T	Distance	Arithmetic mean	Standard Deviation	Relative Importance %	Answer level:	Order
1	**Social sustainability of human resources**	3.83	0.65	76.6	High	**1**
2	**Psychological sustainability of human resources**	3.71	0.71	74.2	High	**2**
3	**Environmental sustainability of human resources**	3.58	0.76	71.6	High	**3**
Total Variable	**Human resource sustainability**	3.71	0.71	74.13	High	**-**

Table (7) shows that the first dimension of human resource sustainability had the highest ranking, with a mean of (3.83), a standard deviation of (0.65), and a significance level of (76.6). This indicates that the university focused on social aspects and strengthening ties among teaching staff.

The third dimension ranked last, with a mean of (3.58), a standard deviation of (0.76), and a relative significance of.(71.6)

As for the dependent variable as a whole, the mean was (3.71), the standard deviation was (0.71), and the relative significance was (74.13%). This indicates that the university focused on sustainability aspects.

Fifth: Impact Hypothesis Testing

The impact hypothesis test aims to determine the extent to which the requirements for improving scientific productivity can explain the change in human resource sustainability at Cordoba Private University, as well as to test the effect of each dimension of the independent variable on the dependent variable. The results of structural equation modeling using SmartPLS software were relied upon, employing path coefficients (β), t-values, p-values, and the coefficient of determination (R^2).

a. Testing the main hypothesis: The main hypothesis states the following: There is a statistically significant effect of the requirements for improving scientific productivity on the sustainability of human resources at Cordoba Private University.

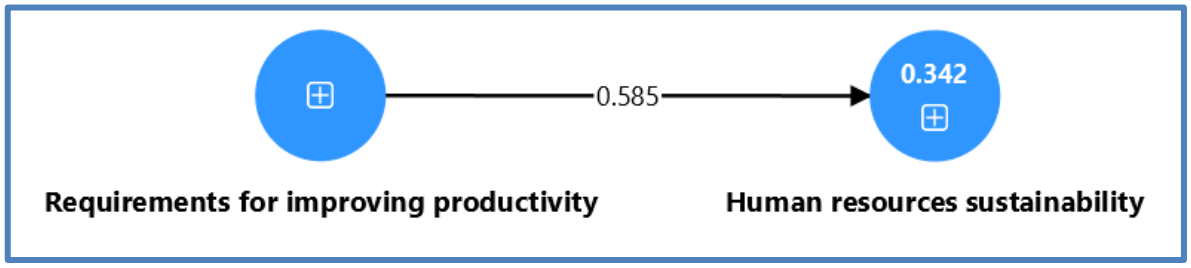

Figure 2. Testing the effect hypothesis

To test this hypothesis, the direct path between the requirements for improving scientific productivity and the sustainability of human resources was estimated, and the results were as follows:

Path of Influence	Original Sample (O) / β	Sample Mean (M)	STDEV	T Statistics	P-value	R^2
Requirements for improving scientific productivity → Human resource sustainability	0.585	0.622	**0.067**	8.695	0	**0.342**

The results show that the direct path coefficient (β = 0.585) indicates a positive effect of improving scientific productivity requirements on human resource sustainability. The t-value (T = 8.695) is greater than (1.96), and the p-value (P = 0.000) is less than (0.05), confirming that the effect is statistically significant. The R^2 value (R^2 = 0.342) indicates that the independent variable influences the dependent variable by 34.2%, thus accepting the main hypothesis.

4. Conclusion

First: Conclusions

1. The research results showed that Cordoba Private University supports the requirements for improving scientific productivity, with the mean score for the variable being (3.70)..
2. The organization under study prioritizes providing electronic resources and a knowledge infrastructure, which supports and enhances the research activities of its faculty.
3. The descriptive statistics revealed a slight weakness in research funding, which requires future attention.
4. The descriptive statistical analysis showed that the dependent variable is available at a good level, indicating good harmony and interaction among employees and a positive work environment.
5. The results of the impact hypothesis test confirm that attention to the requirements of scientific productivity positively impacts the sustainability of human resources, indicating a correlation between the two variables.

Second: Recommendations

1. We recommend that the university administration pay greater attention to the requirements and dimensions of scientific productivity.
2. We propose the establishment of a research team at the university, supporting researchers with funding and incentivizing them by sponsoring the publication of their research in reputable journals and facilitating their participation in scientific conferences.
3. We recommend training researchers in publishing in reputable scientific journals and developing their scientific research skills.
4. We recommend working to enhance environmental sustainability at the university and digitizing its operations to ensure energy conservation, reduce paper consumption, and improve the work environment.
5. We recommend developing a strategic plan to address weaknesses in scientific productivity requirements and human resource sustainability in order to retain qualified personnel within the university.

References

[1] J. S. Huang, "Building research collaboration networks: An interpersonal perspective for research capacity building," *The Journal of Research Administration*, vol. 45, no. 2, pp. 89–112, 2014.

[2] P. S. Aithal, "How to increase research productivity in higher educational institutions: SIMS model," *International Journal of Scientific Research and Modern Education*, vol. 1, no. 1, pp. 447–458, 2016.

[3] M. M. J. Olvido, "Developing research culture: An outcomes perspective," *The Journal of Research Administration*, vol. 52, no. 1, pp. 15–37, 2021.

[4] J. M. Frantz, A. George, M. Hunter-Hüsselmann, H. Kapenda, and Z. Yassin, "Institutional policies, practices and initiatives impacting research productivity," *The Journal of Research Administration*, vol. 53, no. 2, pp. 40–59, 2022.

[5] J. C. De Jongh *et al.*, "The role of research units at higher education institutions," *The Journal of Research Administration*, vol. 54, no. 2, pp. 54–66, 2023.
[6] V. L. Hesli and J. M. Lee, "Faculty research productivity: Why do some of our colleagues publish more than others?" *PS: Political Science & Politics*, vol. 44, no. 2, pp. 393–408, Apr. 2011, doi: 10.1017/S1049096511000242.
[7] L. Ocampo *et al.*, "Research productivity for augmenting the innovation potential of higher education institutions: An interpretive structural modeling approach and MICMAC analysis," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 8, no. 3, Art. no. 148, pp. 1–25, Sep. 2022.
[8] R. J. Zaugg, A. Blum, and N. Thom, "Sustainability in human resource management: Evaluation report," Institute for Organisation and Personnel, Univ. of Bern, Bern, Switzerland, Rep. 51, 2001.
[9] P. J. Gollan, "High involvement management and human resource sustainability: The challenges and opportunities," *Asia Pacific Journal of Human Resources*, vol. 43, no. 1, pp. 18–33, Apr. 2005.
[10] I. Ehnert, *Sustainable Human Resource Management: A Conceptual and Exploratory Analysis from a Paradox Perspective*. Heidelberg, Germany: Physica-Verlag, 2009.
[11] R. Kramar, "Beyond strategic human resource management: Is sustainable human resource management the next approach?" *The International Journal of Human Resource Management*, vol. 25, no. 8, pp. 1069–1089, 2014.
[12] I. Ehnert, S. Parsa, I. Roper, M. Wagner, and M. Muller-Camen, "Reporting on sustainability and HRM: A comparative study of sustainability reporting practices by the world's largest companies," *The International Journal of Human Resource Management*, vol. 27, no. 1, pp. 88–108, 2016.
[13] P. De Prins, L. Van Beirendonck, A. De Vos, and J. Segers, "Sustainable HRM: Bridging theory and practice through the Respect Openness Continuity model," *Management Revue*, vol. 25, no. 4, pp. 263–284, 2014.
[14] S. T. Majon and D. G. Hameed, "Human resource sustainability and its impact on the competitive performance of banks: Evidence from Iraqi private banks," *Tikrit Journal of Administrative and Economic Sciences*, vol. 21, no. 69, pp. 112–128, 2025.
[15] B. Mazur and A. Walczyna, "Bridging sustainable human resource management and corporate sustainability," *Sustainability*, vol. 12, no. 21, Art. no. 8987, Nov. 2020.
[16] H. Peretz, "Sustainable human resource management and employees' performance: The impact of national culture," *Sustainability*, vol. 16, no. 17, Art. no. 7281, Aug. 2024.