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The Equilibrium between Education and Research in Agricultural Higher Education: A Pathological Analysis

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ABSTRACT

Education and research are fundamental pillars of educational systems, including agricultural higher education institutions. However, an inadequate balance between these components can lead to a deviation from the primary goals of these institutions. This study aimed to conduct a pathological analysis of the equilibrium between education and research in the higher education system of agriculture in Iran. "Three-pronged pathology model" was utilized, comprising components of "context" (including knowledge, moral, individual-psychological, satisfaction, and the thematic nature), "behavior" (including planning, coordination, control, and monitoring), and "structure" (including demonstrative, diversity, consequence, and political). This quantitative study is applied in purpose, non-experimental in design, retrospective in timing, survey-based in data collection, and descriptive-causal comparative in data analysis. The data collection instrument was a researcher-developed questionnaire, with face and content validity confirmed by experts. The reliability of the questionnaire was established using Cronbach's alpha for each variable ($0.704 \leq \alpha \leq 0.902$). The statistical population comprised faculty members from agricultural departments of public universities in Iran (N=3335), with a sample of 307 selected. Results indicated a tendency among faculty members towards research activities. The greatest gap and imbalance between education and research were observed in the areas of context, followed by structure and behavior. This indicates that the existing context and structure push faculty members towards research activities for their sustainability and advancement in the agricultural higher education system. This poses a serious issue that must be addressed by policymakers and decision-makers.

Keywords: Pathology, Three-pronged model, Gap analysis, Teaching and research balance, Agricultural faculty member.

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1. INTRODUCTION

In today's rapidly changing world, universities and higher education institutions continuously reassess their positions in response to societal demands. They require a distinctive and clear identity to make appropriate decisions concerning these changes (Zubrick et al., 2001); because current developments in higher education have impacted the relationship between education and research (Gutiérrez et al., 2023). These changes include a shift towards mass education, a reconsideration and alteration of scheduling, the nature of education, the political context, and perspectives regarding the existence of knowledge in education and research (Brew, 2010). In this context, universities seek to strengthen the link between education and research to enhance the quality of both (Hajdarpasic et al., 2015). This interaction creates a space for the transfer of knowledge and research experiences educationally (Gutiérrez et al., 2023). Research focuses on discovering and expanding knowledge, while education relates to distributing and empowering learners (Hattie & Marsh, 1996). Some scholars consider teaching to be the core of educational institutions, while others emphasize the connection between education and research (Brew, 2010).

The balance between education and research in educational systems, particularly in agriculture, is one of the fundamental challenges that requires attention and thorough examination (Doss et al., 2022). In today's world, where rapid changes and the need for innovation in agriculture are acutely felt (Soleymani Sardo et al., 2024), faculty members, as the key components of this system, play a crucial role in establishing and maintaining this balance (Gutiérrez et al., 2023). However, significant gaps exist between the current and desired states in this area, which can negatively impact the quality of education and research (Hattie & Marsh, 1996). Research indicates that many agricultural faculty members face challenges such as resource shortages, time pressures, and inadequate support (Khan et al., 2023). These challenges affect the quality of education (Chaka, 2022) and may also lead to a decline in research quality (Hasan et al., 2020), ultimately impacting sustainable agricultural development (Akinhanmi, 2023). For example, a lack of financial resources and educational equipment can hinder the provision of quality education and effective research (Lee, 2004). Moreover, time pressures resulting from high workloads can prevent faculty members from focusing on in-depth and quality research (Flores et al., 2020). In this regard, a precise understanding of faculty members' perspectives on this balance and a pathological analysis of the current situation can help identify existing strengths and weaknesses (Okoduwa, 2018).

Achieving equilibrium between education and research is crucial in agricultural higher education, yet Iranian institutions face an increasing imbalance. Historically, faculty have been expected to excel in both domains. However, in recent years, a shift has occurred due to evolving incentives and competitive pressures. Policies prioritizing research output, coupled with the need for rapid promotion and participation in international scientific competitions, have inadvertently incentivized faculty to focus more on research. Consequently, education risks becoming a routine task, receiving less attention and dedication. This trend threatens the holistic development of students and the long-term vitality of agricultural knowledge transfer in Iran (Soleymani Sardo et al., 2024).

Undoubtedly, education and research are two fundamental pillars in educational systems, including agricultural higher education institutions. However, an inappropriate balance between these two components leads to a deviation from the primary objectives of such institutions—objectives that foster growth, entrepreneurship, creativity, and ultimately the development of the agricultural sector. Currently in Iran, agricultural education, which should primarily be skill-oriented, is often delivered in a theoretical manner due to a lack of resources. On the one hand, effective education relies on continuous research, and if education is not practical, there will be a subsequent lack of quality research conducted by trainees. Therefore, faculty members must maintain their clear identity and strengthen the effective linkage between education and research to address existing challenges and enhance the quality of both education and research. **This is a pressing issue that requires responsiveness to the challenges emerging in a changing world and the improvement of education and research quality, particularly in the realm of agricultural higher education. Although some previous studies have examined the balance between education and research among faculty members, this topic has received less attention in the field of agricultural higher education.** Accordingly, the **purpose** of the study **was** to analyze the pathological balance between the two pillars of education and research in the higher education system of agriculture in Iran.

2. THEORETICAL BACKGROUND

The assertion that universities are established for education and research is, to many, indisputable; however, the significance and interrelations between these two domains remain subjects of discussion and examination. Researchers have analyzed this relationship in various ways. The perspective of Hattie & Marsh (1996) is recognized as one of the most important

classifications in this area, highlighting three types of relationships: positive, negative, and neutral between education and research.

A negative relationship between education and research arises when individuals engaged in research devote most of their time, energy, and commitment to research, while those focused on education concentrate all their efforts in this area. From this viewpoint, concurrently achieving high productivity in both research and education becomes an intensive task, making excellence in both domains seem nearly impossible. Education necessitates a focus on knowledge transfer, whereas research concentrates on the discovery and generation of new results (Bajaj, 2022). These differences may diminish productivity in both fields and reflect the distinct personality traits of educators and researchers. Research and education have contradictory roles with varying expectations and commitments, resulting from different reward systems (Bowering et al., 2021). These systems focus on the generation of new knowledge and its transfer, each requiring substantial time and commitment (Åkerfeldt et al., 2020). Researchers need more time and resources for advancement in scientific fields, whereas educators require energy and time for effective teaching (Chen & Lee, 2022).

In a positive relationship, research and education are conducted simultaneously and interactively, reinforcing one another. Researchers produce new knowledge by pursuing new questions that are directly utilized in educational activities. This aids educators in conveying contemporary knowledge to students, who, by acquiring the latest skills, contribute to the production of new knowledge (Hattie & Marsh, 1996).

In arguments regarding the absence of a relationship between education and research, it is believed that research and education are two distinct activities. Research involves the discovery of new knowledge, while education refers to the transfer of that knowledge to others. These two domains require different skills and approaches, with individuals evaluated separately in each (Nguyen & Miller, 2023). This separation can have its advantages; for instance, it allows educators to be more influenced by the actual needs of learners and can enhance the quality of education and learning through teachers' focus on instruction, while researchers can concentrate all their energy on research activities to contribute to new knowledge production (Bozeman et al., 2013).

A review of the theoretical literature indicates the importance and emphasis on the relationship and connection between education and research in higher education systems (Karim et al., 2024). Research motivation among faculty members leads to improved educational quality, while strengthening education enhances research productivity. A sole focus on either education

or research can decrease the quality of the other. Researchers believe that effective teaching is essential for success in research, and on the other hand, the relationship between research and teaching must be developed effectively to optimize the learning process (Alshammari, 2023). Reflecting on the above, it can be understood that education and research are two fundamental pillars in any higher education system, including agricultural higher education, which require simultaneous attention. However, a lack of balance between these two can lead to adverse effects. To address such issues, there is an urgent need for "pathological analyses." Pathology is the process of examining and analyzing the causes, symptoms, signs, and consequences of a problem across various scientific domains. The main goal of pathology is to identify problems in the normal progression of phenomena and activities and to gain a better understanding of the causes or factors that lead to abnormalities in a system, which necessitates determining appropriate solutions to rectify these abnormalities and ensure the health and improvement of the system (Majidi et al., 2018).

For pathological analysis in diverse contexts, various theories and models have been proposed. These include Lewin and Lovit's organizational pathology model, Nadler-Tushman's organizational pathology model, the McKinsey 7S pathology model, Harrison's individual and group behavior pathology model, the four-frame pathology model, and the pathological three-pronged model (Majidi et al., 2018). One of the best models for pathological analysis that has already been used in the agricultural higher education system is the three-pronged model. The theoretical framework of this research is based on the "three-pronged" model, which encompasses the components of "context," "content," and "structure" (Figure 1). Behavioral factors include motivation and satisfaction of human resources, while structural factors relate to the internal relationships of the system (Kundi et al., 2023). Contextual factors also include the environment and external conditions that affect other factors (Zhang & Shin, 2015).

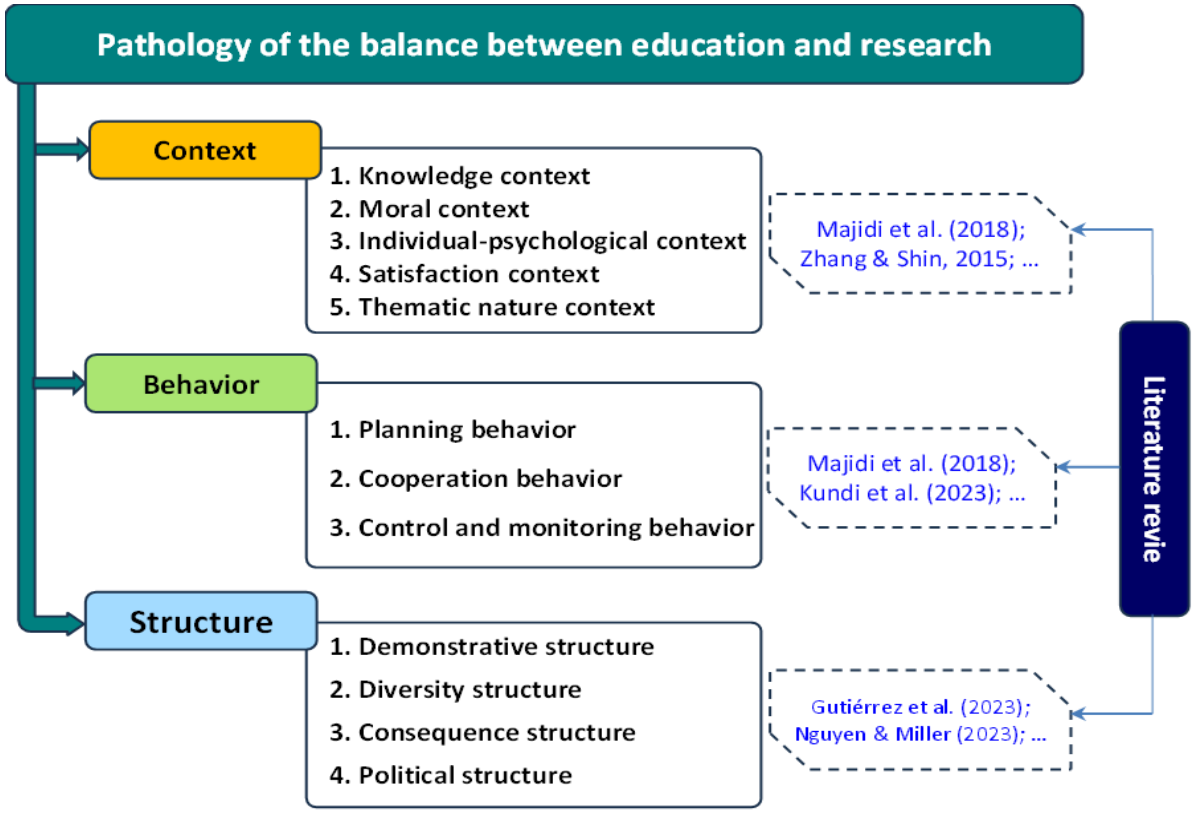

Figure 1. Three-pronged model as a research conceptual framework.

3. RESEARCH METHOD

This quantitative research is applied in purpose, non-experimental in design and variable control, retrospective in timing, survey-based in data collection, and descriptive-causal comparative in data analysis. The data collection instrument was a researcher-developed questionnaire, whose face and content validity were confirmed by a panel of experts in the field of agricultural higher education. The reliability of the questionnaire was also established using Cronbach's alpha ($0.704 \leq \alpha \leq 0.902$) for the item categories of each variable, through a pilot test conducted outside the statistical population with 30 samples (Table 1).

Table 1. Cronbach's alpha test results for research variables.

Component	Variable		Number of items		Cronbach's alpha (α)		Semantic judgment*
Context	Knowledge	In educcastion	6	12	0.753	0.835	Good
		In research	6		0.647		
	Moral	In educcastion	6	12	0.834	0.776	Acceptable
		In research	6		0.504		
	Individual-psychological	In educcastion	6	12	0.772	0.831	Good
		In research	6		0.580		
	Satisfaction	In educcastion	6	12	0.711	0.772	Acceptable
		In research	6		0.725		
	Thematic nature	In educcastion	6	12	0.753	0.865	Good
		In research	6		0.755		
Behavior	Planning	In educcastion	9	18	0.792	0.886	Good
		In research	9		0.779		
	Cooperation	In educcastion	7	14	0.844	0.845	Good
		In research	7		0.771		
	Control and monitoring	In educcastion	5	10	0.852	0.902	Perfect
		In research	5		0.826		
Structure	Demonstrative	In educcastion	6	12	0.809	0.755	Acceptable
		In research	6		0.735		
	Diversity	In educcastion	6	12	0.681	0.704	Acceptable
		In research	6		0.673		
	Consequence	In educcastion	3	6	0.651	0.708	Acceptable
		In research	3		0.770		
	Political	In educcastion	8	16	0.654	0.816	Good
		In research	8		0.762		

***.** Source: Habibpour & Safari (2009): 0.90 ≤α: Perfect; 0.80≤α<0.90: Good; 0.70≤α<0.80: Acceptable; 0.60≤α<0.70: With hesitation; 0.50≤α<0.60Weak; α<0.50: Not acceptable

The statistical population of the study included faculty members from agricultural departments of public universities in Iran (N=3335). Using the Krejcie and Morgan sampling table (Krejcie and Morgan, 1970), 345 individuals were selected as a sample. Ultimately, 307 completed questionnaires were returned, resulting in a response rate of approximately 89%. The sample selection occurred in three stages. **Scientific poles in Iran were initially selected using stratified random sampling. Subsequently, universities within each pole were chosen via cluster sampling. Finally, stratified random sampling with proportional allocation was used to select agricultural education groups as strata.**

The research questionnaire assessed the main components of the study (Figure 1), which includes context (encompassing knowledge, moral, individual-psychological, satisfaction, and thematic aspects), behavior (covering planning, coordination, control, and monitoring behaviors), and structure (including demonstrative, diversity, consequence, and political structures), each evaluated through a number of items (Table 1). Respondents were asked to express their opinions on the two pillars "Education" and "Research" using a 5-point Likert scale (very low = 1, low = 2, medium = 3, high = 4, and very high = 5). The collected data were analyzed using $SPSS_{27}$ software.

4. RESULTS AND SISCUSSION

4.1. Respondents' descriptive statistics

258 respondents (approximately 87 percent) were male, and the rest (about 13 percent) were female. Most of them (about 95 percent) were married. The average age of the respondents was approximately 48 years. The average work experience was about 19 years, with a minimum of 1 year and a maximum of 46 years reported. About half of them held the rank of associate professor (Table 2).

Table 2. Descriptive statistics of some personal and professional characteristics of the respondents.

Variable	Level	Frequency	Percent	Valid percent	Cumulative percent	Min	Max	Mode	Median	M	SD
Gender	Female	37	12.05	12.54							
	Gender	258	84.03	87.46				Gender			
	No response	12	3.92								
Age (year)	$X_i \leq 35$	19	6.19	6.31	6.31						
	$35<X_i \leq 50$	151	49.20	50.17	56.48						
	$50<X_i$	131	42.67	43.52	100	34	70	41	45	48.15	9.362
	No response	6	1.40								
Marital status	Single	25	8.14	8.14							
	Married	267	86.97	95.11				Married			
	No response	15	4.89								
Work experience (year)	$X_i \leq 5$	7	2.28	2.31	2.31						
	$15<X_i \leq 10$	75	24.43	24.75	27.06						
	$10<X_i \leq 15$	73	23.78	24.09	41.15						
	$15<X_i \leq 20$	65	21.17	21.45	72.60	1	43	12	20	19.26	10.462
	$20<X_i$	83	27.04	27.40	100						
	No response	4	1.30								
Scientific rank	Assistant Professor	97	31.60	32.33	32.33						
	Associate Professor	158	51.46	52.67	85.00			Associate Professor			
	Professor	45	14.66	15.00	100						
	No response	7	2.28								

Min: Minimum, Max: Maximum, M: Mean; SD: Standard deviation.

4.2. Descriptive statistics of the components of the three-pronged theory

Descriptive statistics measuring the items that make up the components of the three-pronged pathology theory are presented in Tables 3-5. The results indicate that, from the respondents' perspective, each item has a higher average in research compared to education. In fact, this reflects a greater inclination among faculty members to focus on research activities rather than educational activities. This finding differs from the results of Gutiérrez et al. (2001) but aligns with the research of Soleymani Sardo et al. (2024).

Table 3. Descriptive statistics and ranking of the items of the "context" component in the analysis of the balance between education and research.

In education			Variable	Row	Items	In research		
Rank	SD	M				M	SD	Rank
4	1.254	2.83	Knowledge	1	Your awareness of existing laws and regulations	4.58	0.751	1
1	1.039	3.11		2	Your level of expertise	4.57	0.733	2
6	1.045	2.68		3	Your level of knowledge in teaching/research techniques	4.58	0.751	1
4	0.964	2.70		4	The level of knowledge of other faculty members about laws, techniques and specialized subjects	4.57	0.733	2
3	1.017	2.83		5	The amount of notification of relevant laws and regulations by the university	4.58	0.751	1
2	1.375	3.52		6	Existence and provision of related workshops and training courses	4.06	0.395	3
	3.572	**17.67**	**Mean**		(Between 6 and 30)	**26.97**	**2.581**	
1	1.108	2.80	Moral	1	The existence of different conditions, criteria and ethical regulations	4.58	0.765	2
2	0.937	2.75		2	Variety of disciplinary regulations	4.57	0.733	3
5	0.964	2.20		3	Supervision and monitoring in compliance with the points of affairs	4.58	0.751	1
4	0.943	2.35		4	Disciplinary action by the university	4.57	0.733	3
6	0.999	2.17		5	Compliance with ethical and disciplinary principles (such as copying and plagiarism) by you	4.58	0.751	1
3	0.971	2.52		6	Compliance with ethical and disciplinary principles by other colleagues	4.06	0.395	4
	3.217	**14.79**	**Mean**		(Between 6 and 30)	**26.96**	**2.595**	
3	0.943	2.44	Individual-psychological	1	Ease of doing things	4.29	0.834	6
1	1.126	2.78		2	A pleasure to do things for you	4.46	0.708	2
5	0.943	2.39		3	The level of interest and having a favorable attitude towards doing things	4.36	0.742	5
3	1.260	2.78		4	The level of motivation to do things	4.48	0.660	1
6	1.098	2.27		5	Attitudes and views of other colleagues towards educational/research matters	4.40	0.716	4
2	1.135	2.78		6	The sensitivity of the scientific community of your field in educational/research cases	4.45	0.673	3
	4.221	**15.44**	**Mean**		(between 6 and 30)	**26.25**	**3.500**	
3	1.227	2.71	Satisfaction	1	Your level of satisfaction with the results of doing things	4.29	0.834	6
2	1.124	2.73		2	The level of satisfaction with the variety of different activities	4.46	0.708	2
6	0.996	2.42		3	The fruitfulness of the results	4.36	0.742	5
4	1.047	2.67		4	How satisfied your colleagues are with the usefulness of the results	4.48	0.660	1
5	1.110	2.53		5	The existence of material incentives necessary to do things	4.40	0.716	4
1	1.319	2.92		6	The existence of spiritual incentives necessary to do things	4.45	0.673	3
	4.154	**15.99**	**Mean**		(between 6 and 30)	**26.44**	**3.586**	
2	0.979	2.57	Thematic nature	1	The concreteness of the results of doing things	4.46	0.708	2
4	0.956	2.37		2	Ease of doing things	4.36	0.742	4
3	0.879	2.56		3	It is possible to do things	4.48	0.660	1
1	1.103	2.71		4	Managing affairs	4.40	0.716	3
4	**2.589**	**10.23**	**Mean**		(Between 4 and 20)	**17.70**	**2.391**	
	10.527	**74.06**	**Total mean**		(Between 28 and 140)	**124.31**	**11.332**	

M: Mean; SD: Standard deviation

Rank: The ranking is based on the mean. In the cases where the means were equal, the lower standard deviation was the higher ranking criterion.

Table 4. Descriptive statistics and ranking of the items of the "behavior" component in the analysis of the balance between education and research.

In education			Variable	Row	Items	In research		
Rank	SD	M				M	SD	Rank
8	0.915	2.66	Planning	1	Appropriate design and planning by you	4.61	0.643	3
5	1.096	2.72		2	Appropriate design and planning by the university	4.62	0.663	2
1	1.049	2.96		3	Proper implementation of programs by you	4.62	0.618	1
7	1.053	2.69		4	Proper implementation of programs by the university	4.58	0.751	4
3	1.065	2.78		5	Proper control of program execution by you	4.57	0.733	5
4	0.973	2.75		6	Appropriate control of program implementation by the university	4.58	0.751	4
2	1.034	2.89		7	Appropriate evaluation of programs by you	4.57	0.733	5
9	0.908	2.59		8	Appropriate evaluation of programs by the university	4.58	0.751	4
6	0.951	2.71		9	The amount of follow-up and analysis of the effectiveness of activities	4.57	0.733	5
	5.398	24.75	Mean		(Between 9 and 45)	41.34	4.1285	
5	0.985	2.55	Cooperation	1	The extent to which you cooperate with other people in carrying out activities at the university or national level	4.62	0.663	2
1	1.019	2.70		2	The extent of your cooperation with other people in carrying out activities at the international level	4.62	0.618	1
6	0.925	2.48		3	The extent to which other people cooperate with you in carrying out activities at the university or national level	4.58	0.751	3
7	1.107	2.47		4	The degree of cooperation of other people with you in carrying out activities at the international level	4.57	0.733	4
4	1.047	2.64		5	Easy to work with others	4.58	0.751	3
2	1.066	2.69		6	The willingness of other colleagues to cooperate	4.57	0.733	4
3	0.960	2.67		7	Your willingness to cooperate with other people in doing activities	4.58	0.751	5
	4.161	18.21	Mean		(Between 7 and 35)	32.15	3.331	
1	0.967	2.92	Control and monitoring	1	The degree of control and monitoring of the realization of goals and strategies by you	4.58	0.751	1
2	1.085	2.79		2	The amount of control and monitoring of how you perform activities	4.57	0.733	2
5	0.880	2.61		3	The degree of control and monitoring of organizational culture by you	4.58	0.751	1
4	1.041	2.69		4	Monitoring the allocation and optimal consumption of resources by you	4.57	0.733	2
3	1.012	2.73		5	Existence and diversity in evaluation and feedback by you	4.62	0.618	3
	3.575	13.73	Mean		(Between 5 and 25)	22.94	2.293	
			Total mean		(Between 21 and 105)	96.43	9.795	

M: Mean; SD: Standard deviation
Rank: The ranking is based on the mean. In the cases where the means were equal, the lower standard deviation was the higher ranking criterion.

Table 5. Descriptive statistics and ranking of the items of the "structure" component in the analysis of the balance between education and research.

In education			Variable	Row	Items	In research		
Rank	SD	M				M	SD	Rank
1	1.098	2.69	Demonstrative	1	Benefiting from the benefits of publication or transfer of results	4.58	0.765	2
6	1.049	2.31		2	Ease of publishing, transferring or exchanging the results of activities at the provincial or national level	4.57	0.733	3
4	1.105	2.45		3	The possibility of seeing the results of activities at the provincial or national level	4.58	0.751	1
5	1.004	2.33		4	Ease of publishing, transferring or exchanging the results of activities at the international level	4.57	0.733	3
2	1.058	2.62		5	The possibility of seeing the results of activities at the international level	4.58	0.751	1
3	1.113	2.55		6	Existence of channels and ways of publishing, transferring or exchanging results (magazines, books, website, conference, workshop, etc.)	4.06	0.395	4
	3.642	**14.96**	**Mean**		(Between 6 and 30)	**26.96**	**2.595**	
1	1.019	2.63	Diversity	1	The amount of variety of laws, regulations and guidelines for doing different things	4.63	0.655	2
5	0.998	2.34		2	The possibility of working with other faculty members and experts at the university and national levels	4.61	0.643	5
4	1.082	2.44		3	The possibility of cooperation with other faculty members and experts at the international level	4.62	0.663	4
2	1.162	2.63		4	The amount of diversity in the choice of topics for activities	4.62	0.618	3
3	1.023	2.53		5	The variety of incentives offered at the university or national level	4.63	0.639	1
6	0.874	2.20		6	The amount of variety of incentives offered at the international level	4.06	0.395	6
	3.688	**14.78**	**Mean**		(Between 6 and 30)27.18	**27.18**	**2.252**	
1	0.933	2.45	Consequence	1	The existence of sufficient rules, regulations and guidelines in the university or Ministry of Ataf for publishing, transferring or exchanging results at the national level.	4.61	0.643	3
3	1.068	2.29		2	The existence of laws, rules of the Ummah and sufficient guidelines in the university or Ministry of Ataf for publishing, transferring or exchanging results at the international level.	4.62	0.663	2
2	0.843	2.34		3	Necessary infrastructure to monitor or follow up the educational/research successes of faculty members (for example, referrals)	4.62	0.618	1
	2.066	**7.08**	**Mean**		(Between 3 and 15)	**13.86**	**1.356**	
6	0.927	2.38	Political	1	University policies to deliver different outcomes of activities	4.61	0.643	3
3	1.126	2.55		2	University policies to provide incentives for doing activities	4.62	0.663	2
5	0.918	2.39		3	The existence of a necessary policy structure to guarantee the implementation and continuation of activities by the university	4.62	0.618	1
4	1.037	2.47		4	Sustainable policy in maintaining the productivity of activities	4.58	0.751	4
1	0.966	2.63		5	The extent of your compatibility and coordination with existing regulations and policies	4.57	0.733	5
7	1.017	2.35		6	Availability of financial resources to do things	4.58	0.751	4
2	1.039	2.58		7	Availability of physical facilities and equipment to do things	4.57	0.733	5
8	0.908	2.26		8	Availability of sufficient human resources to do things	4.58	0.751	4
	4.246	**19.61**			(Between 8 and 40)	**36.76**	**3.694**	
	9.264	**56.43**			(Between 23 and 115)	**104.77**	**9.573**	

M: Mean; SD: Standard deviation
Rank: The ranking is based on the mean. In the cases where the means were equal, the lower standard deviation was the higher ranking criterion.

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4.3. Comparative analysis between the components of the two pillars of education and research

To conduct a comparative analysis between the two pillars of education and research based on the theoretical framework presented (Figure 1), comparisons were made among the three components: "context" (including knowledge, moral, individual-psychological, satisfaction, and thematic nature), "behavior" (including planning, coordination, control, and monitoring), and "structure" (including demonstrative, diversity, consequence, and political) using the Paired-samples t-test for each of the stated components (Table 6).

The results of the paired comparisons in Table 6 indicate that the greatest disparity, from the respondents' perspective, lies within the context component, with a mean difference of -50.25. Following this, the structure component shows a mean difference of -48.34, while the behavior component exhibits the smallest difference at -39.75.

Table 6. Paired-samples t test results for comparing the components and variables used in the analysis of the balance between education and research.

Component	Variable	Mean of education	Mean of research	t	Sig.
Behavior	Control and monitoring	13.73	22.94	-9.21	0.008
	Cooperation	18.21	32.15	-13.94	0.000
	Planning	24.75	41.34	-16.59	0.000
	Total	**56.68**	**96.43**	**-39.75**	**0.000**
Structure	Consequence	7.08	13.86	-6.78	0.045
	Demonstrative	14.96	26.96	-12.00	0.000
	Diversity	14.78	27.18	-12.40	0.000
	Political	19.61	36.76	-17.15	0.000
	Total	**56.43**	**104.77**	**-48.34**	**0.000**
Context	Thematic nature	10.23	17.70	-7.47	0.030
	Knowledge	17.67	26.97	-9.30	0.008
	Satisfaction	15.99	26.44	-10.45	0.004
	Individual-psychological	15.44	26.25	-10.81	0.005
	Moral	14.79	26.96	-12.17	0.000
	Total	**74.06**	**124.31**	**-50.25**	**0.030**
Comparison of three components		**187.12**	**325.51**	**-138.39**	**0.000**

This statement of discrepancy is illustrated as a pyramid in Figure 2, based on the three aforementioned components and their constituent variables, indicating that as one moves from the base of the pyramid to its apex, the discrepancies diminish. This means that the existing contexts and structures direct the faculty members in agricultural higher education institutions towards a greater focus on educational activities. In fact, the current contexts and structures are designed to compel faculty members to pursue this emphasis. This finding aligns with the studies conducted by Hattie & Marsh (1996), Brew (2010), and Hajdarpasic et al. (2015).

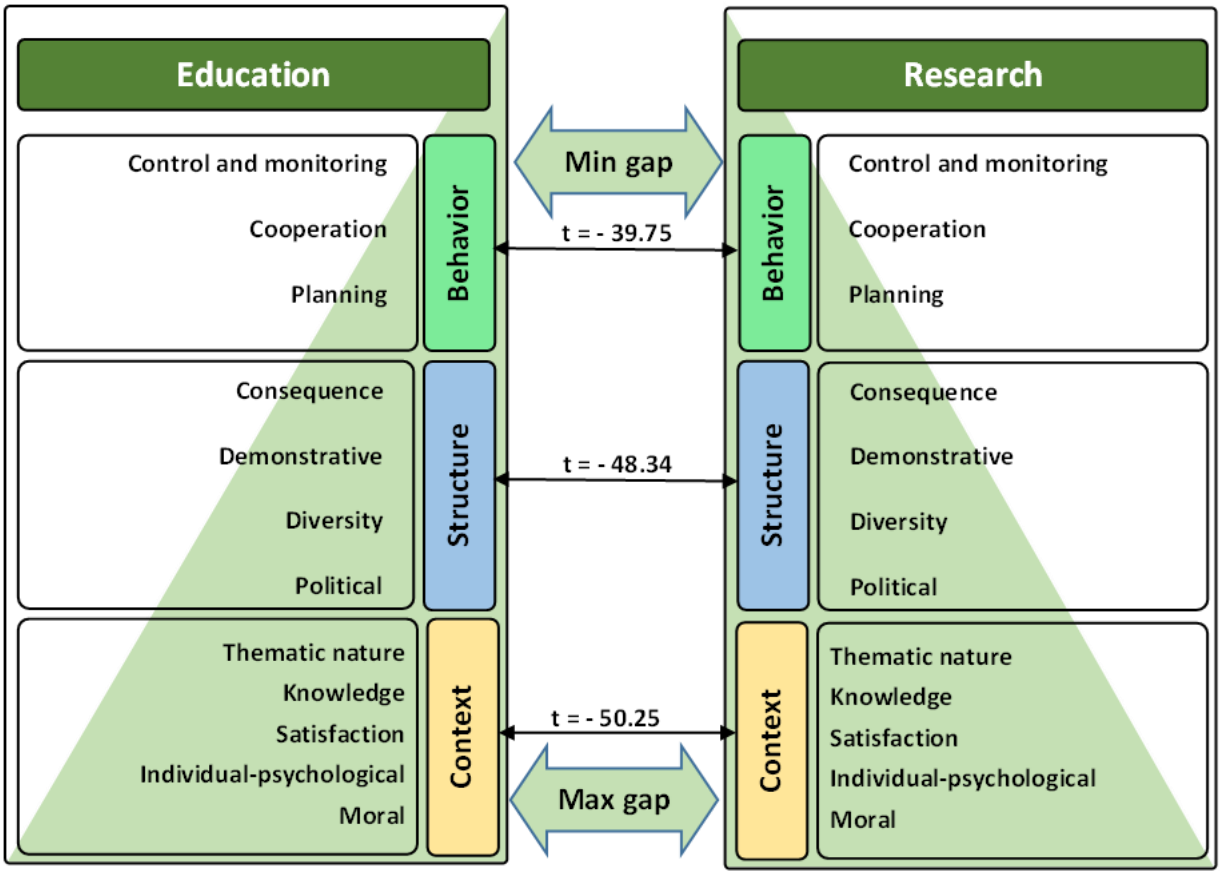

Figure 2. Pyramid analysis of the gap between the focus of agricultural faculty members on education and research.

5. CONCLUSIONS

The equilibrium between education and research in the agricultural higher education system has become a complex and challenging issue as a key component of sustainable development in this field. This study, which conducts a pathological analysis of this equilibrium, reveals a significant tendency among faculty members towards research activities, resulting in a noteworthy gap between education and research. This situation is a consequence of the inefficiency of structures, contexts, and also unstable behaviors in planning and control. The results further indicate that education, as a fundamental pillar in the agricultural education system, has been marginalized due to insufficient attention from faculty members and policymakers. Specifically, the imbalance among context, structure, and behavior in this system has led to neglecting some essential aspects of education and ultimately diminished the quality of scientific and technological production in the agricultural sector. Therefore, policymakers and decision-makers in the agricultural higher education system need to address these gaps and work towards strengthening the interaction between these two key elements. In this regard, the following policy suggestions can be proposed:

- Formulating Incentive Policies for Balancing Education and Research: Decision-making bodies should develop policies enhancing the balance between education and research. For instance, incentive programs could be established for faculty members actively engaged in both areas. These programs should include financial benefits, career advancements, and awards for those who proportionately dedicate their efforts to both domains.

- Strengthening Research-Based Educational Programs: Universities should focus on developing educational programs centered on research, where students gain practical experience through group projects and research activities. This approach can enhance the educational and research quality and enable students to operate more effectively in various fields.

- Creating a More Interactive Environment Between Faculty Members and Students: Organizing workshops and joint meetings between faculty members and students can facilitate knowledge exchange and foster stronger connections between research and education. Such interactions can assist in refining educational programs and better reflecting the real needs of students and the job market.

- Continuous Monitoring and Evaluation of Educational and Research Outputs: Establishing performance evaluation systems to continuously assess educational and research outputs is essential. These systems can help identify strengths and weaknesses, leading to the formulation of appropriate policies based on the findings.

Despite its strengths, this study has limitations. One major limitation is that the findings are based solely on the opinions of agricultural faculty members. Consequently, the perspectives of other stakeholders, such as students, policymakers, and employers, have been overlooked, and potentially different viewpoints regarding the balance between education and research may not have been considered in this analysis. Furthermore, conducting such investigations using qualitative or mixed methods could provide a deeper understanding of the current situation and yield more reliable results. Future research should explore a broader range of stakeholder perspectives and utilize various methods and methodologies to achieve a more comprehensive understanding.

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تعادل آموزش و پژوهش در آموزش عالی کشاورزی: تحلیل آسیب شناختی

فاطمه سلیمانی ساردو، مسعود بیژنی، اسماعیل کرمی دهکردی، و فاطمه سپهوند

چکیده

آموزش و پژوهش از ارکان اساسی نظام های آموزشی از جمله مؤسسات آموزش عالی کشاورزی هستند. با این حال، تعادل ناکافی بین این مؤلفه ها می تواند منجر به انحراف از اهداف اولیه این مؤسسات شود. این مطالعه با هدف تحلیل آسیب شناختی تعادل آموزش و پژوهش در نظام آموزش عالی کشاورزی ایران انجام شد. از "مدل آسیب شناسی سه وجهی" استفاده شد که شامل اجزای "زمینه" (شامل دانش، اخلاقی، فردی-روانی، رضایت و ماهیت موضوعی)، "رفتار" (شامل برنامه ریزی، هماهنگی، کنترل و نظارت) و "ساختار" (شامل نمایشی، تنوع سیاسی، پیامد) است. این مطالعه کمی از نظر هدف کاربردی، از نظر طراحی غیرتجربی، از نظر زمان‌بندی گذشته‌نگر، در جمع‌آوری داده‌ها پیمایشی و در تحلیل داده‌ها از نوع توصیفی-علی مقایسه‌ای است. ابزار گردآوری اطلاعات، پرسشنامه محقق ساخته بود که روایی صوری و محتوایی آن توسط خبرگان تایید شد. پایایی پرسشنامه با استفاده از آلفای کرونباخ برای هر متغیر($0/704 \leq \alpha \leq 0/902$) به دست آمد. جامعه آماری شامل اعضای هیأت علمی گروه های کشاورزی دانشگاه های دولتی ایران (N=3335) با نمونه 307 نفر انتخاب شد. نتایج حاکی از گرایش اعضای هیئت علمی به فعالیت های پژوهشی بود. بیشترین شکاف و عدم تعادل بین آموزش و پژوهش در حوزه‌های بافت و پس از آن ساختار و رفتار مشاهده شد. این نشان می دهد که بافت و ساختار موجود، اعضای هیئت علمی را به سمت فعالیت های تحقیقاتی برای پایداری و پیشرفت در سیستم آموزش عالی کشاورزی سوق می دهد. این یک موضوع جدی است که باید توسط سیاست گذاران و تصمیم گیران مورد توجه قرار گیرد.