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Waste of Knowledge in Iranian Universities: A Comparative Study

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Abstract

Purpose: This study aims to investigate the level of knowledge waste in selected universities and identify the key factors contributing to this phenomenon.

ethodology: An evaluative research design was employed. Data were collected using the standardized questionnaire developed by Klein et al. (2023), which includes four dimensions: explicit knowledge waste, failure to retain tacit knowledge, overspecialization, and underutilized talents. The study population comprised experts in educational affairs from Shahid Beheshti University, the Central Organization of Islamic Azad University, and the Central Organization of Payam Noor University. Systematic sampling was used to select participants, and the Cochran formula determined a sample size of 157 respondents. Data were analyzed using SPSS version 22.

Findings: The results revealed that all four dimensions of knowledge wast were above average in the studied universities. Furthermore, a significant relationship was observed between knowledge waste dimensions andthe introversion-extroversion traits of respondents. Extroverted participants were more likely to believ that explicit knowledge waste occurs more frequently in universities. Logistic regression analysis identified overspecialization as the most influential factor contributing to knowledge waste..

Conclusion: The findings suggest that factors beyond managerial and knowledge management practices—particularly overspecialization—significantly contribute to knowledge waste in universities.

Value: This study provides a novel perspective in the field of knowledge management by paradoxically revealing that academia, despite its mission to generate and disseminate knowledge, can itself be a major center of knowledge waste .

Keywords: ***Knowledge Waste, Knowledge Management, Knowledge Creation, Knowledge Sharing.***

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Extended Abstract

Introduction: The concept of knowledge waste emerged alongside the development of knowledge management, introduced by Nonaka and Takeuchi. Over time, this notion was further explored within the context of lean production systems, which emphasized the elimination of seven key types of waste: time, errors, unnecessary motion, transportation, inventory, over-processing, and overproduction. More recently, Kline et al. (2023), expanded the concept of knowledge waste and classified it into four main core dimensions: (1) loss of explicit knowledge; (2) failure to retain tacit knowledge; (3) overspecialization or job-irrelevant expertise; and (4) the underutilization of talent.

Purpose: This study aims to assess the extent of knowledge waste in Iranian universities, explore the relationship between the dimensions of knowledge waste and demographic variables and identify the most influential factors contributing to knowledge waste in higher education institutions. Accordingly, the study seeks to address three main research questions: (1) What is the level of knowledge waste in the universities under investigation? (2) How are the dimensions of knowledge waste related to employees' demographic characteristics? and (3) Which dimension of knowledge waste has the greatest impact on knowledge waste in Iranian universities?

Methodology: This evaluative study, conducted in January 2024, adopted a survey-based quantitative approach. The target population comprised administrative staff working in the educational departments of Iranian universities. Three universities were selected as case studies, representing different organizational types: a public university (Shahid Beheshti University, Tehran), a private university (Islamic Azad University, Central Branch, Tehran), and a semi-public distance-learning university (Payame Noor University, Central Branch, Tehran). Systematic sampling was employed to select participant within each institution. The Cochran formula was used to determine the sample size. Based on the estimated total number of educational staff obtained from the universities' official websites, the final sample size was calculated at 157 participants -50 from Shahid Beheshti University, 50 from Islamic Azad University, and 57 from Payame Noor University. Data were collected using the standardized Waste of Knowledge Questionnaire developed and validated by Kline et al. (2023). This instrument consists of 18 items categorized into four dimensions: waste of explicit knowledge (6 items), failure to retain tacit knowledge (4 items), overspecialization (4 items), and underutilized talent (4 items). Respondents rated each item on a 10-point Likert scale ranging from 1 (strongly disagree) to 10 (strongly agree). Data analysis was conducted using SPSS version 22. After data screening and confirmation of the absence of systematic missing data, several statistical tests were applied, including the binomial tests, Kruskal-Wallis tests, Friedman tests, chi-square tests, and logistic regression analysis to examine relationships and identify significant factors contributing to knowledge waste.

Findings: The findings revealed a statistically significant difference, at the 95% confidence level, between respondents who disagreed with the existence of knowledge waste (selecting options 1 to 5) and those who agreed with it (selecting options 6 to 10) across all dimensions of the construct (see Table 1)

Table 1. Binomial Test Results

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Waste of explicit knowledge	Group 1	<= 5	18	0.11	0.50	.000
	Group 2	> 5	139	0.89		
	Total		157	1.00		
Failure to Retain Tacit Knowledge	Group 1	<= 5	16	0.10	0.50	.000
	Group 2	> 5	141	0.90		
	Total		157	1.00		
Overspecialization	Group 1	<= 5	17	0.11	0.50	.000
	Group 2	> 5	140	0.89		
	Total		157	1.00		
Underused Talent	Group 1	<= 5	12	0.08	0.50	.000
	Group 2	> 5	145	0.92		
	Total		157	1.00		
Waste of Knowledge (Overall)	Group 1	<= 5	8	0.05	0.50	0.000
	Group 2	> 5	149	0.95		
	Total		157	1.00		

The results indicate that all respondents significantly agreed and explicit knowledge waste occurs in the studied universities, that there is a failure to retain tacit knowledge, that expertise is often unrelated to job roles, and that the talents of employees, students, and faculty members are underutilized. Furthermore, the findings revealed that personality type (introverted vs. extroverted) was significantly associated with only one dimension-explicit knowledge waste- while no significant differences were observed in the other dimensions. The significance level of the difference between introverts and extroverts in the explicit knowledge waste dimension was 0.044($p<0.05$). Based on the mean ranks, extroverts (mean rank 85.64) were significantly more likely than introverts to believe that explicit knowledge waste occurs in universities. For the remaining dimensions of knowledge waste, no significant differences were found between the two groups. This suggests that extroverts are more sensitive to explicit forms of knowledge waste, possibly because their greater social interaction and exposure to academic outputs mak them more aware of observable instances of explicit knowledge loss.

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Table 2. Logistic Regression Analysis, variables in Equation

Step	Variable	B	S.E.	Wald	df	Sig.
Step 1	Overspecialization	1.950	0.515	14.332	1	0.000
	Constant	7.735 –	2.487	9.671	1	0.002
Step 2	waste of explicit knowledge	2.641	1.110	5.662	1	0.017
	Overspecialization	4.198	1.968	4.549	1	0.033
	Constant	33.499 –	14.417	5.399	1	0.020
Step 3	Waste of explicit knowledge	52.502	1759.367	0.001	1	0.976
	Retention of tacit knowledge	26.443	903.176	0.001	1	0.977
	Overspecialization	47.202	1722.024	0.001	1	0.978
	Constant	670.020 –	21671.035	0.001	1	0.975

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Finally, the results of the logistic regression analysis (Table 2) indicated that in the first step, overspecialization emerged as the most significant factor influencing knowledge waste in the studied universities. This finding suggests that, within these institutions, the assignment of employees to non-specialized or mismatched jobs is more prevalent and exerts a greater impact on knowledge waste than other contributing factors.

Conclusion: In a society such as Iran, where the phenomenon of brain drain poses a critical challenge for both organizational and national policymakers, the concept of knowledge waste assumes particular importance. The migration of skilled professionals can be viewed as a clear manifestation of knowledge waste, resulting from factors such as the loss of explicit knowledge, the failure to retain tacit knowledge, overspecialization, and the underutilization of talent, all of which were examined in this study. The findings revealed that overspecialization is the most influential dimension of knowledge waste, suggesting that it may also play a pivotal role in driving brain drain. This underscores the need for further research to explore how organizational structures and role assignments contribute to this issue and how targeted interventions might mitigate its effects.

Value: This study is the first to apply the waste of knowledge scale to examine the level and dimensions of knowledge waste in Iranian universities Moreover, it offers a unique and critical perspective within the field of knowledge management by paradoxically highlighting that academia -despite its fundamental mission to create and disseminate knowledge- can itself be a major source of knowledge waste. This insight contributes to a deeper understanding of inefficiencies in knowledge processes within higher education institutions and underscores the need for systematic strategies to minimize such waste.

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