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The Impact of Entrepreneurial Leadership on Employee Creativity and Innovation Through Risk-Taking

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Abstract

The main purpose of this study is to investigate the impact of entrepreneurial leadership on employee creativity and innovation. In today's competitive and dynamic environment, businesses must focus on survival and achieving a competitive advantage. This requires entrepreneurial leaders who guide employees to foster creativity and innovation, thereby enhancing organizational dynamism and growth. The study adopts a descriptive-survey approach, utilizing random sampling and four questionnaires to collect data. The statistical population comprises permanent and contractual employees of Aftab Oil Refining Company, with a sample size of 148 determined by Cochran's formula. Also, statistical methods such as linear regression were used to analyze the data. The results indicate that entrepreneurial leadership positively affects both creativity and innovation among employees.

Keywords: Entrepreneurial leadership, Employee innovation, Employee creativity, Risk-taking, Aftab oil refining company.

1 | Introduction

The In today's highly competitive world, only a small number of organizations can hope to survive and prosper. This reality equally applies to future research on creativity and innovation. Employee creativity and innovation can only flourish under effective leadership styles paired with a supportive culture and environment in the workplace. Hence, leadership plays a central role in encouraging creativity and innovation in organizational contexts. Leadership can be described as the act of influencing employees to strive enthusiastically toward achieving organizational objectives. In various definitions, leadership is presented as the process of guiding and influencing others to align their behaviors with organizational goals [1], [2].

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In the contemporary business landscape, organizations must adapt to their surrounding environments to survive and remain competitive. To achieve this adaptation, organizations need to develop certain capabilities, such as fostering creativity, making swift and informed decisions, embracing calculated risks, leveraging advanced technologies, and aligning their processes with the dynamic demands of the market. Additionally, organizations must identify and address new customer needs while enhancing their competencies to align with market trends. To meet these goals, organizational leaders must adopt appropriate strategies, one of the most crucial being their method of guiding employees. If a manager can adapt their leadership style to varying circumstances and inspire entrepreneurial behaviors among their workforce, they can secure and elevate their organization's position.

Businesses also face rapid changes and dynamic environments, necessitating that they direct their activities toward survival, competitive advantage, value creation, profitability, and sustainable growth. This requires the presence of leaders and managers with entrepreneurial and innovative approaches who can guide businesses toward a culture of commitment to entrepreneurship, creativity, and innovation, ultimately driving superior performance.

Entrepreneurial leadership emerges as a new theoretical framework in the existing leadership and entrepreneurship literature, addressing the dynamic changes of the 21st century. While relatively novel, entrepreneurial leadership is significantly impactful as it focuses on creating value. In the modern era, creativity and innovation are vital in generating value, serving as essential prerequisites for organizational survival and development while also providing a competitive advantage.

Iqbal et al. [3] suggest that the concept of entrepreneurial leadership represents a critical phase in the evolution and transformation of businesses. This paradigm of leadership begins with defining a vision and engaging in strategic thinking. Subsequently, it fosters employee motivation and commitment, enabling the organization to explore and exploit emerging opportunities. Entrepreneurial leadership encourages innovation and the creative utilization of human and social capital, along with other organizational resources, to co-create value. Ultimately, it establishes the necessary foundation and environment to facilitate entrepreneurship within organizations [4].

Entrepreneurial leaders focus on enhancing the identification and exploitation of opportunities through their actions and influence on others. By setting examples and engaging in entrepreneurial behaviors themselves, they encourage others to imitate their practices and challenge the status quo. The passion, creativity, and vision of entrepreneurial leaders inspire employees to experiment and learn independently. Such leadership characterizes organizations that successfully seize new opportunities in a timely manner and derive value from them.

Risk-taking is the essence of fostering an innovative environment, as no innovation can occur without taking risks. Proposing something different and new inherently involves uncertainty; the idea may fail, face criticism, lack support, or even lead to outright failure. Without the courage to embrace such risks, innovations remain mere ideas. Therefore, leaders must cultivate and promote a non-punitive environment that encourages risk-taking.

Entrepreneurial leaders themselves exhibit risk-taking behaviors and inspire their employees to focus on creative tasks rather than mundane ones [5], [6]. Observing the risk-taking behaviors of their leaders, employees are expected to develop attitudes, confidence, and competencies to take calculated risks in their creative endeavors. Previous studies have established a positive relationship between entrepreneurial leadership and employee creativity and innovation, emphasizing that a risk-tolerant environment significantly contributes to generating novel ideas. In other words, creative behaviors are closely tied to risk-taking.

2 | Methodology

The research methodology of this study is classified as applied in terms of its objective, as its results have practical applications. Regarding its nature and content, the study falls under the category of descriptive-

survey research. Descriptive refers to the collection of information through library studies, while survey-based indicates that data collection tools include questionnaires. The research methodology is categorized as descriptive-survey in both aspects of nature and content.

Since data collection was conducted during the first half of 2023, the research is considered cross-sectional in terms of its temporal horizon. The statistical population comprises permanent and contractual employees of Aftab Oil Refining Company, totaling 148 individuals, as determined by Cochran's formula. Simple random sampling was employed in this study.

To assess employee creativity, the study utilized the questionnaire developed by Zhou and George [7], which consists of 13 questions. Employee innovation was measured using Janssen's [8] questionnaire, comprising 9 questions. Entrepreneurial leadership was evaluated through Renko et al. [6] questionnaire, containing 8 questions that measure five dimensions: innovativeness, creativity, motivation, intense work enthusiasm, risk-taking, and visionary leadership.

The study also employed Segal et al. [9] questionnaire to measure risk-taking. This tool includes 15 questions divided into three dimensions: the willingness to pursue challenging goals in life, the inclination to undertake work with reasonable income and job security, and the desire to execute new and risk-taking projects. All questionnaires were based on a five-point Likert scale.

The relationships among the study's components were analyzed using statistical software, with SPSS employed for data analysis.

To ensure the validity of the questionnaires, both face validity and construct validity (via Confirmatory Factor Analysis (CFA)) were assessed. The face validity of the questionnaires was reviewed and confirmed by academic advisors and supervisors. Cronbach's alpha and Composite Reliability (CR) metrics were utilized to evaluate the reliability of the reflective measurement model.

The factor loadings are presented in *Table 1*. All factor loadings for the variables exceed 0.5, indicating an acceptable level of validity.

Table 1. Confirmatory factor analysis.

Item	Factor Loading	Item	Factor Loading
Q1	0.825	Q24	0.812
Q2	0.794	Q25	0.844
Q3	0.796	Q26	0.894
Q4	0.786	Q27	0.822
Q5	0.681	Q28	0.844
Q6	0.757	Q29	0.899
Q7	0.809	Q30	0.896
Q8	0.761	Q31	0.674
Q9	0.729	Q32	0.747
Q10	0.743	Q33	0.799
Q11	0.663	Q34	0.514
Q12	0.582	Q35	0.462
Q13	0.717	Q36	0.518
Q14	0.594	Q37	0.607
Q15	0.591	Q38	0.701

Table 1. Continued.

Item	Factor Loading	Item	Factor Loading
Q16	0.720	Q39	0.750
Q17	0.601	Q40	0.729
Q18	0.629	Q41	0.650
Q19	0.624	Q42	0.549
Q20	0.585	Q43	0.655
Q21	0.726	Q44	0.725
Q22	0.764	Q45	0.663
Q23	0.874		

According to the software output, the factor loadings of items 10, 32, 33, and 44 were reported to be less than 0.50. Therefore, these items are not validated and have been excluded from the analysis.

Cronbach's Alpha is a criterion used to evaluate the internal consistency of questionnaire items. A Cronbach's Alpha value of 0.70 or higher is considered acceptable for each variable.

CR is a more advanced measure of reliability compared to Cronbach's Alpha, as it evaluates the reliability of variables based on the correlation between indicators rather than using an absolute scale. If the CR of each variable is greater than 0.70, it indicates a reasonable internal consistency for the model [10]. The CR of each research variable is presented in *Table 2*.

Table 2. Confirmatory factor analysis.

Variable	Cronbach's Alpha	CR
Employee Creativity	0.890	0.908
Innovative Behaviour	0.921	0.934
Entrepreneurial Leadership	0.949	0.958
Employee Risk-Taking	0.859	0.887

3| Hypothesis Analysis

After the validation of the questionnaire and model fit, which is part of the model fitting process, the research hypothesis must be examined.

3.1| First Sub-Hypothesis: Entrepreneurial Leadership Has a Positive and Significant Effect on the Creativity of Employees at Aftab Oil Company

To examine the effect of entrepreneurial leadership on employee creativity, the collected data were subjected to statistical analysis, as follows:

Table 3. Summary of statistical information: Entrepreneurial leadership on employee creativity.

Model	Correlation Coefficient	R-squared	Adjusted R-squared	Standard Error of Estimate
1	0.411	0.169	0.164	0.429

According to the table, the R-squared value of 0.169 indicates that 16.9% of the variance in employee creativity is explained by entrepreneurial leadership, and the adjusted R-squared value of 16.9% represents the actual effect of entrepreneurial leadership on employee creativity.

Table 4. Regression analysis of the impact of entrepreneurial leadership on employee creativity.

Model	Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.
1	Regression	5.476	1	5.476	29.740	0.00
	Residual	26.855	146	0.184		
	Total	32.361	147			

The significance of the regression in the table is indicated by the F value (29.740) and the Sig. value less than 0.05, which shows that entrepreneurial leadership has a significant and positive effect on employee creativity.

Table 5. Regression coefficients for the effect of entrepreneurial leadership on employee creativity.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1	B	Std. Error	Beta		
	Constant	3.160		20.016	0.00
	Entrepreneurial Leadership	0.219	0.411	5.453	0.00

According to the table, the effect of entrepreneurial leadership on employee creativity is represented by the standardized Beta coefficient of 0.411. In other words, with an increase of one standard deviation in entrepreneurial leadership, employee creativity increases by 0.411.

3.2 | Second Sub-Hypothesis: Entrepreneurial Leadership has a Positive and Significant Effect on Innovative Behavior at Aftab Oil Company

To examine the effect of entrepreneurial leadership on innovative behavior, the collected data were subjected to statistical analysis, as follows:

Table 6. Summary of statistical information: Entrepreneurial leadership on innovative behavior.

Model	Correlation Coefficient	R-squared	Adjusted R-squared	Standard Error of Estimate
1	0.715	0.512	0.508	0.518

According to the table, the R-squared value of 0.512 indicates that 51.2% of the variance in entrepreneurial leadership is explained by innovative behavior, and the adjusted R-squared value of 50.8% represents the actual effect of entrepreneurial leadership on innovative behavior.

Table 7. Regression analysis of the impact of entrepreneurial leadership on innovative behavior.

Model	Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.
1	Regression	41.213	1	41.213	153.063	0.00
	Residual	39.311	146	0.269		
	Total	80.524	147			

The significance of the regression in the table is indicated by the F value (153.063) and the Sig. value less than 0.05, which shows that entrepreneurial leadership has a significant and positive effect on innovative behavior.

Table 8. Regression coefficients for the effect of entrepreneurial leadership on innovative behavior.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1	B	Std. Error	Beta		
	Constant	1.316		6.891	0.00
	Entrepreneurial Leadership	0.601	0.715	12.372	0.00

According to the table, the effect of entrepreneurial leadership on innovative behavior is represented by the standardized Beta coefficient of 0.715. In other words, with an increase of one standard deviation in entrepreneurial leadership, innovative behavior increases by 0.715 standard deviations.

3.3 | Third Sub-Hypothesis: Entrepreneurial Leadership Has a Positive and Significant Effect on Employees' Risk-Taking at Aftab Oil Company

To examine the effect of entrepreneurial leadership on employees' risk-taking, the collected data were subjected to statistical analysis, as follows:

Table 9. Summary of statistical information: Entrepreneurial leadership on employees' risk-taking.

Model	Correlation Coefficient	R-squared	Adjusted R-squared	Standard Error of Estimate
1	0.351	0.123	0.117	0.489

According to the table, the R-squared value of 0.123 indicates that 12.3% of the variance in employees' risk-taking is explained by entrepreneurial leadership, and the adjusted R-squared value of 11.7% represents the actual effect of entrepreneurial leadership on employees' risk-taking.

Table 10. Regression analysis of the impact of entrepreneurial leadership on employees' risk-taking.

Model	Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.
1	Regression	4.910	1	4.910	20.503	0.00
	Residual	34.968	146	0.240		
	Total	39.878	147			

The significance of the regression in the table is indicated by the F value (20.503) and the Sig. value less than 0.05, which shows that entrepreneurial leadership has a significant and positive effect on employees' risk-taking.

Table 11. Regression coefficients for the effect of entrepreneurial leadership on employees' risk-taking.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1		B	Std. Error	Beta		
	Constant	2.914	0.180		16.183	0.00
	Entrepreneurial Leadership	0.208	0.046	0.351	4.528	0.00

According to the table, the effect of entrepreneurial leadership on employees' risk-taking is represented by the standardized Beta coefficient of 0.351. In other words, with an increase of one standard deviation in entrepreneurial leadership, employees' risk-taking increases by 0.351 standard deviations.

3.4 | Fourth Sub-Hypothesis: Risk-taking has a Positive and Significant Effect on Employee Creativity at Aftab Oil Company

To examine the effect of risk-taking on employee creativity, the collected data were subjected to statistical analysis, as follows:

Table 12. Summary of statistical information: Risk-taking on employee creativity.

Model	Correlation Coefficient	R-squared	Adjusted R-squared	Standard Error of Estimate
1	0.678	0.459	0.455	0.3462

According to the table, the R-squared value of 0.459 indicates that 45.9% of the variance in employee creativity is explained by risk-taking, and the adjusted R-squared value of 45.5% represents the actual effect of risk-taking on employee creativity.

Table 13. Regression analysis of the impact of risk-taking on employee creativity.

Model	Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.
1	Regression	14.858	1	14.858	123.941	0.00
	Residual	17.503	146	0.120		
	Total	32.361	147			

The significance of the regression in the table is indicated by the F value (123.941) and the Sig. value less than 0.05, which shows that risk-taking has a significant and positive effect on employee creativity.

Table 14. Regression coefficients for the effect of risk-taking on employee creativity.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1	B	Std. Error	Beta		
	Constant	1.736		8.454	0.00
	Risk-Taking	0.610	0.678	11.133	0.00

According to the table, the effect of risk-taking on employee creativity is represented by the standardized Beta coefficient of 0.678. In other words, with an increase of one standard deviation in risk-taking, employee creativity increases by 0.418 standard deviations.

3.5 | Fifth Sub-Hypothesis: Risk-Taking Has a Positive and Significant Effect on Employees' Innovative Behavior at Aftab Oil Company

To examine the effect of risk-taking on employees' innovative behavior, the collected data were subjected to statistical analysis, as follows:

Table 15. Summary of statistical information: Risk-taking on employees' innovative behavior.

Model	Correlation Coefficient	R-squared	Adjusted R-Squared	Standard Error of Estimate
1	0.341	0.116	0.110	0.698

According to the table, the R-squared value of 0.116 indicates that 11.6% of the variance in employees' innovative behavior is explained by risk-taking, and the adjusted R-squared value of 11% represents the actual effect of risk-taking on employees' innovative behavior.

Table 16. Regression analysis of the impact of risk-taking on employees' innovative behavior.

Model	Source	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.
1	Regression	9.365	1	9.365	19.214	0.00
	Residual	71.159	146	0.487		
	Total	80.524	147			

The significance of the regression in the table is indicated by the F value (19.214) and the Sig. value less than 0.05, which shows that risk-taking has a significant and positive effect on employees' innovative behavior.

Table 17. Regression coefficients for the effect of risk-taking on employees' innovative behavior.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1	B	Std. Error	Beta		
	Constant	1.821		4.398	0.00
	Risk-Taking	0.485	0.341	4.383	0.00

According to the table, the effect of risk-taking on employees' innovative behavior is represented by the standardized Beta coefficient of 0.341. In other words, with an increase of one standard deviation in risk-taking, employees' innovative behavior increases by 0.341 standard deviations.

4 | Conclusion

previously mentioned, the main goal of this research was to examine the impact of entrepreneurial leadership on employee creativity and innovation. The regression test results showed that entrepreneurial leadership has an effect on creativity and innovation in employees.

Entrepreneurial leadership's effect on creativity is represented by a standardized Beta coefficient of 0.418. In other words, with an increase of one standard deviation in entrepreneurial leadership, employee creativity increases by 0.411 standard deviations.

The effect of entrepreneurial leadership on innovative behavior is represented by a standardized Beta coefficient of 0.341. In other words, with an increase of one standard deviation in entrepreneurial leadership,

innovative behavior increases by 0.715 standard deviations. Entrepreneurial leadership, as a leadership style, involves generating new ideas, assessing risks, encouraging creativity, and enhancing employee confidence.

In this context, the following recommendations can be made:

Creating a Creative and Innovative Organizational Culture: Leaders should strive to create a creative and innovative organizational culture. This can be achieved by fostering a dynamic environment and providing opportunities for new ideas and encouraging creativity.

Encouraging Risk-taking: Leaders should allow employees to take risks and propose new ideas. This can be done by creating an environment for idea sharing and encouraging risk-taking.

Providing Positive Feedback: Leaders should provide positive feedback and acknowledge employees' efforts. This can be done by encouraging the generation of new ideas and fostering creativity.

Providing Educational Opportunities: Leaders should provide training opportunities for employees to improve their creativity and innovation skills.

Encouraging Collaboration and Teamwork: Leaders should encourage employees to collaborate and work as a team. This can be done by creating spaces for collaboration and teamwork and encouraging new idea generation.

Creating an Environment to Enhance Self-Confidence: Leaders should create an environment to enhance employees' self-confidence. This can be achieved by encouraging risk-taking and new idea generation.

In previous studies, a positive relationship between entrepreneurial leadership and employee creativity and innovation was observed. However, the goal of this research was to investigate the mechanism through which this relationship is formed. The theoretical significance of this research lies in the fact that, in previous studies, the three components—entrepreneurial leadership, employee creativity and innovation, and employee risk-taking—have not been comprehensively studied together. Additionally, from a practical standpoint, this research can be vitally important for organizations, as in today's dynamic, challenging, and competitive business environment, employee creativity and innovation are crucial for achieving the fundamental goal of organizational survival. Subsequently, they help organizations gain a competitive advantage and improve their market share.

Therefore, this research focuses on entrepreneurial leadership, a new and highly regarded style in many organizations and among researchers. This style plays a crucial role in creating vision, guiding and encouraging employees, and creating value, and it explores its relationship with employee creativity and innovation, considering employee risk-taking as a key variable.

Limitations of the Study

One limitation of this study is that the research community was restricted to the employees of Aftab Oil Refining Company and conducted within a single industry.

Another limitation was the time frame of the study, which was confined to a specific period, and there was no access to historical data from earlier times.

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