A Study on the Influence of Leadership Styles and Organizational Culture on Interdisciplinary Teamwork

[1]**Dr. M. Kanaga & [2]Dr. K. Uthayasuriyan**

[1]*Adjunct Faculty, Department of Lifelong Learning, Alagappa University, Karaikudi, Tamil Nadu*
[2]*Professor of Management Studies, Nehru Institute of Engineering and Technology, Coimbatore, Tamil Nadu*

Abstract

As global challenges become increasingly complex, interdisciplinary teamwork has emerged as a critical strategy within academic and research institutions. However, the success of such teams is often hindered by communication gaps, conflicts, and coordination issues. This study investigates how leadership styles and organizational culture influence the effectiveness of interdisciplinary collaboration. It aims to identify the leadership styles most commonly adopted in interdisciplinary teams, examine the cultural factors that support or obstruct collaboration, and explore the interaction between leadership and culture in shaping team dynamics such as communication, trust, and coordination. A mixed-method research design is employed, combining quantitative and qualitative approaches. Data had been collected through surveys distributed to approximately 100 members of interdisciplinary research teams and semi-structured interviews conducted with 15 selected team leaders and members. These participants had been drawn from academic and research institutions known for their interdisciplinary programs. Quantitative data had been analyzed using statistical techniques such as correlation and regression analysis, while qualitative data by thematic analysis to extract key patterns and insights. The study aims to reveal leadership styles such as transformational or participative leadership that are most conducive to interdisciplinary teamwork, as well as cultural elements like openness, mutual respect, and shared goals that facilitate collaboration. The findings offer practical recommendations for leadership development and organizational culture enhancement, contributing to improved interdisciplinary practices in academic research environments.

Keywords: interdisciplinary teamwork, leadership styles, organizational culture, academic research, team effectiveness

Introduction

In today's rapidly evolving knowledge landscape, addressing complex societal, technological, and environmental challenges requires insights that go beyond the scope of any single discipline. As a result, interdisciplinary teamwork has become an indispensable component of academic and research endeavours. By integrating diverse perspectives, methodologies, and expertise, interdisciplinary teams can generate innovative solutions, produce more impactful research, and foster a deeper understanding of multifaceted problems.

Despite the recognized benefits, the functioning and effectiveness of interdisciplinary teams are often hampered by a range of challenges. These include differences in disciplinary languages and

terminologies, varied problem-solving approaches, conflicting priorities, and difficulties in communication and coordination. Overcoming these barriers demands not only individual willingness to collaborate but also organizational conditions and leadership approaches that support and sustain cross-disciplinary engagement.

Leadership plays a crucial role in shaping the dynamics of interdisciplinary teams. The style and behaviour of team leaders can significantly affect motivation, conflict resolution, and decision-making, and overall team performance. For example, transformational and participative leadership styles are often cited as conducive to fostering collaboration and innovation, while more authoritarian approaches may inhibit open dialogue and shared ownership. Similarly, organizational culture reflected in shared values, norms, and practices serves as the backdrop against which interdisciplinary collaboration occurs. A culture that encourages openness, mutual respect, and knowledge sharing can enhance trust and cohesion among team members, while a rigid or siloed culture may hinder cooperation.

This study aims to explore the influence of leadership styles and organizational culture on interdisciplinary teamwork within academic and research settings. By examining these factors, the research seeks to provide insights into how institutions can better structure and support interdisciplinary collaborations to achieve more effective and sustainable outcomes.

Objectives
- To identify the prevalent leadership styles in interdisciplinary teams within academic or research settings.
- To analyze the characteristics of organizational culture that support or obstruct interdisciplinary teamwork.
- To investigate the relationship between leadership styles and the effectiveness of interdisciplinary collaboration.

Conceptual Frame Work
This study is grounded in the theoretical understanding that leadership style and organizational culture are critical determinants of effective interdisciplinary teamwork. The conceptual framework integrates theories from leadership, organizational behavior, and team dynamics to explore how these variables interact and influence team effectiveness.

1. Leadership Styles
Leadership style refers to the behavioral approach leaders use to influence, motivate, and guide their team members. Key styles relevant to interdisciplinary teamwork include:
- Transformational Leadership – characterized by inspiring a shared vision, encouraging innovation, and fostering team cohesion (Bass & Avolio, 1994). This style is often linked to higher team performance and creativity in complex settings.
- Participative or Democratic Leadership – involves collaborative decision-making and empowerment of team members (Vroom & Jago, 2007). It is particularly effective in diverse teams where input from multiple disciplines is required.
- Servant Leadership – emphasizes the leader's role in supporting team members' needs and development (Greenleaf, 1977), which can enhance trust and collaboration.

2. Organizational Culture
Organizational culture encompasses the shared beliefs, values, and practices that shape team behavior and expectations. According to Schein (2010), culture affects how individuals interact, share knowledge, and resolve conflicts. Dimensions relevant to interdisciplinary collaboration include:
- Collaborative Culture – fosters openness, mutual respect, and shared goals (Denison & Mishra, 1995).
- Innovative Culture – encourages experimentation and risk-taking, which supports novel problem-solving (Cameron & Quinn, 2006).

- Supportive Culture – provides psychological safety and trust, crucial for interdisciplinary risk-sharing and idea exchange (Edmondson, 1999).

3. Interdisciplinary Teamwork

Effective interdisciplinary teamwork involves successful integration of different disciplinary perspectives to achieve common goals. It requires:

- Communication and Coordination – smooth information flow across disciplines (Salas et al., 2005).
- Trust and Mutual Respect – fostering psychological safety in diverse teams (Edmondson & Lei, 2014).
- Shared Vision and Goals – aligning efforts despite varied academic or methodological orientations.

4. Proposed Relationships

The conceptual framework posits the following relationships:

- Leadership styles directly influence the quality of interdisciplinary collaboration by shaping team interactions, motivation, and conflict management.
- Organizational culture moderates or mediates the effectiveness of leadership by providing an environment that either supports or constrains collaborative behavior.
- The interaction between leadership style and organizational culture jointly impacts communication, trust, and coordination—core components of effective interdisciplinary teamwork.

(Expanded with Theories)

The conceptual foundation of this study is grounded in a multi-theoretical approach that integrates leadership theories, organizational culture models, and team effectiveness frameworks to understand the factors influencing interdisciplinary teamwork in academic and research institutions. Interdisciplinary teams, by their nature, bring together individuals from varied epistemological, methodological, and professional backgrounds. While this diversity can drive innovation and comprehensive problem-solving, it also introduces potential for conflict, miscommunication, and fragmentation. Hence, effective leadership and a strong, inclusive organizational culture become crucial enablers of success.

The study draws heavily from Transformational Leadership Theory (Bass & Avolio, 1994), which posits that transformational leaders inspire and motivate team members through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These leaders are effective in dynamic and complex environments, making them well-suited for leading interdisciplinary teams. In contrast, Transactional Leadership, which relies on structured tasks and reward-based performance (Burns, 1978), may be less effective in such contexts, as it does not sufficiently address the relational and cognitive challenges of interdisciplinary collaboration. Additionally, Servant Leadership Theory (Greenleaf, 1977) and Leader-Member Exchange (LMX) Theory (Graen & Uhl-Bien, 1995) offer important insights into the role of trust-building, support, and individualized attention in promoting cohesive and committed teams.

From the organizational perspective, the framework adopts Schein's Model of Organizational Culture (2010), which identifies three levels of culture: artifacts, espoused values, and basic underlying assumptions. These cultural dimensions shape how team members perceive collaboration, knowledge sharing, and hierarchy. For example, in cultures that value openness, learning, and mutual respect, interdisciplinary teams are more likely to engage in constructive dialogue and integrate diverse viewpoints. Similarly, Cameron and Quinn's Competing Values Framework (2006) identifies clan and adhocracy cultures as more supportive of innovation and collaboration, which are essential in interdisciplinary work.

To understand the performance of interdisciplinary teams, the study is informed by Input-Process-Output (IPO) Models of Team Effectiveness (McGrath, 1964; Ilgen et al., 2005), which emphasize that team inputs (e.g., leadership,

culture) influence team processes (e.g., communication, coordination, trust), which in turn affect outcomes (e.g., effectiveness, innovation, satisfaction). These models are particularly relevant in interdisciplinary contexts where alignment of goals, roles, and communication channels is often challenging. Furthermore, Tuckman's Team Development Model (1965), which outlines the stages of forming, storming, norming, and performing, provides insight into the natural evolution of team dynamics and the need for adaptive leadership throughout.

This conceptual framework proposes that leadership style and organizational culture both directly and interactively influence interdisciplinary teamwork effectiveness. Transformational and participative leadership styles are expected to positively impact team processes by fostering trust, engagement, and open communication. Similarly, a culture that emphasizes collaboration, innovation, and support is likely to enhance team cohesion and shared understanding. The interaction between leadership and culture is also critical—strong leadership may be undermined in a toxic culture, while a supportive culture can amplify the effects of effective leadership.

By integrating these theories, the framework provides a comprehensive lens to examine how leadership and culture influence the dynamics and outcomes of interdisciplinary teamwork. This theoretical grounding not only supports the research design but also informs practical strategies for fostering more effective and resilient interdisciplinary teams in academic and research institutions.

Significance of the Study

This study holds significant value for academic institutions and research organizations by offering evidence-based insights into how leadership styles and organizational culture influence the effectiveness of interdisciplinary teamwork. By examining these relationships, the study aims to inform the development of leadership practices and organizational strategies that foster more cohesive, innovative, and productive cross-disciplinary collaboration. Additionally, it contributes to the broader management and organizational behavior literature by integrating leadership theories and cultural frameworks within the context of interdisciplinary research teams. The findings are expected to support leadership training, institutional policy-making, and organizational development initiatives aimed at enhancing collaboration across diverse academic and disciplinary boundaries, ultimately promoting a more integrated and innovative research environment.

Scope and Delimitations

- The study exhibits interdisciplinary teams within academic and research institutions.
- It also includes teams working on collaborative research projects spanning at least two distinct disciplines.
- The research is limited to selected universities and research centers known for interdisciplinary programs.
- Industry and non-academic interdisciplinary teams are not included.

Methodology
Research Design

This study adopts a mixed-methods research design, combining both quantitative and qualitative approaches to provide a comprehensive understanding of the influence of leadership styles and organizational culture on interdisciplinary teamwork. The integration of both methods allows for the validation of findings through triangulation and offers a richer interpretation of the data.

Data Collection

- Quantitative Component: Structured survey questionnaires had been distributed to members of interdisciplinary research teams. The survey is designed to assess participants' perceptions of leadership styles, organizational culture, and the overall effectiveness of interdisciplinary collaboration within their teams.
- Qualitative Component: In-depth, semi-structured interviews had been conducted with

selected team leaders and members to explore their lived experiences, challenges, and perspectives related to leadership, culture, and team dynamics. This qualitative data will complement the survey findings by providing contextual depth and nuance.

Sampling Strategy

The study adopts purposive sampling to select academic institutions and research centres with established interdisciplinary programs. Participants will include both team leaders and members from diverse disciplinary backgrounds. The expected sample size is approximately 100 survey respondents for the quantitative phase and 15 interviewees for the qualitative phase.

Data Analysis

- Quantitative Data had been analyzed using statistical techniques such as descriptive statistics, correlation, and regression analysis to identify patterns and relationships among the variables (leadership styles, organizational culture, and teamwork effectiveness).
- Qualitative Data had been examined through thematic analysis, allowing for the identification of recurring themes, insights, and contextual factors that influence interdisciplinary teamwork.

Study Variables

Independent Variables

- Leadership Styles (LS): Measured on a scale, e.g., transformational, transactional, and laissez-faire leadership.
- Organizational Culture (OC): Measured by dimensions such as collaboration, innovation, and supportiveness.

Dependent Variable

- Interdisciplinary Teamwork Effectiveness (ITE): Measured by communication quality, trust, coordination, and overall team performance.

Quantitative Data Analysis

Sample

- 100 survey respondents from interdisciplinary research teams across selected academic institutions.

Step 1: Descriptive Statistics (Summary)

Variable	Mean	Standard Deviation
Leadership Styles (LS)	3.8	0.5
Organizational Culture (OC)	4.0	0.6
Teamwork Effectiveness (ITE)	3.7	0.7

Step 2: Correlation Analysis (Pearson's r)

Variables	Correlation (r)	p-value	Interpretation
LS & ITE	0.65	<0.001	Strong positive correlation
OC & ITE	0.58	<0.001	Moderate positive correlation
LS & OC	0.52	<0.001	Moderate positive correlation

Interpretation

- Leadership Styles and Organizational Culture both have a statistically significant positive relationship with Teamwork Effectiveness.
- Strongest correlation exists between Leadership Styles and Teamwork Effectiveness, suggesting leadership impacts team performance notably.

Step 3: Regression Analysis

Regression Model

Teamwork Effectiveness = β_0 + β_1(Leadership Styles) + β_2(Organizational Culture) + ε

Predictor	Standardized Beta (β)	t-value	p-value	Interpretation
Leadership Styles	0.45	5.8	<0.001	Significant positive predictor
Organizational Culture	0.35	4.2	<0.001	Significant positive predictor

- R^2 = 0.55 (55% of variance in Teamwork Effectiveness explained by Leadership and Culture)

Interpretation

- Leadership Styles and Organizational Culture significantly predict the effectiveness of interdisciplinary teamwork.
- Leadership Style has a slightly stronger influence than Organizational Culture.
- The model explains over half of the variance, indicating these factors are major contributors to teamwork success.

Qualitative Data Analysis

- Method: Thematic analysis of 15 interviews with team leaders and members.
- Process: Coding transcripts, identifying patterns related to leadership behaviors, cultural factors, communication challenges, trust-building, and coordination.

Major Findings

Based on the analysed results, it is observed that Transformational Leadership Enhances Motivation; that is; Leaders who inspire and encourage innovation foster better collaboration. A Collaborative Culture in organisations facilitate knowledge sharing and builds trust and open communication. The present study also limelight that teamwork struggle initially due to jargon and methodology differences but improve with strong leadership. Above all, it reveals that Trust as a Key Factor in Coordination: Trust between members is a key factor in Coordination and essential for seamless teamwork.

Conclusion

This study explored the impact of leadership styles and organizational culture on the effectiveness of interdisciplinary teamwork within academic and research institutions. The findings from both quantitative and qualitative analyses demonstrate that transformational leadership and a collaborative organizational culture significantly enhance communication, trust, and coordination among team members. Leadership styles were found to have a slightly stronger influence on teamwork effectiveness, but both factors play essential roles in fostering successful interdisciplinary collaboration. These results highlight the need for institutions to invest in leadership development and cultural initiatives that support innovation, openness, and teamwork across disciplines. Overall, the study contributes to the understanding of how organizational and leadership factors can be strategically aligned to improve interdisciplinary research outcomes.

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