Navigating Cultural Entropy: Leadership Strategies and Organizational Dynamics in Higher Education Institutions

Asni Mustika Rani[1], Syamsul Hadi Senen[2]

[1,2]Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, Bandung, Indonesia

Article Info

ABSTRACT

his study examines cultural entropy in higher education institutions, focusing on its impact on employee performance and organizational dynamics. Using a systematic literature review approach, articles from Scopus, Emerald, and Google Scholar (2010-2023) are analyzed to understand factors influencing cultural entropy, its relation to leadership, and parallels with healthcare settings. The findings indicate that bureaucratic excess, unclear communication, and limited employee engagement contribute to cultural entropy. Transformational leadership is identified as crucial for addressing cultural entropy, emphasizing the need for leaders promoting positive change and continuous learning. However, the study is constrained by the limited literature on cultural entropy in higher education. Further research is necessary to develop tailored interventions for diverse academic contexts. Proactive leadership is emphasized as vital for managing cultural entropy, drawing insights from successful healthcare interventions. Implementing policies to address employee stress can contribute to a more balanced work environment. The study adds to the scant literature on cultural entropy in educational institutions, highlighting unique manifestations and challenges. Exploring parallels between healthcare and academia provides a novel perspective, underscoring distinct dynamics in educational settings and advocating for tailored approaches in addressing cultural entropy.

Corresponding Author:

Name: Asni Mustika Rani
Institution Address: Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, Bandung, Indonesia
e-mail: asnimustika@upi.edu

1. INTRODUCTION

Lecturers and education staff in Indonesia face various challenges that can affect their stress levels. One of the main factors is the high workload, where lecturers are responsible for teaching, research, and administrative tasks, while staff support the operation of the institution. This significant workload can lead to burnout and increased stress levels among education employees. In addition, academic uncertainty is also an important factor. Changes in academic policies and curriculum can create a level of uncertainty that creates stress, because lecturers and staff need to adapt to these changes [1]. This uncertainty can affect the planning and execution of their tasks. Limited

resources, both financial and infrastructure, are additional constraints. These limitations can create discomfort and frustration among employees, who may have to work with limited resources to achieve educational goals.

Administrative and bureaucratic demands in the education system also contribute to stress levels [2]–[4]. Complex administrative requirements and rigorous performance evaluations can create additional stress, especially if not balanced with adequate support. In addition, career development that does not match expectations can create tension. The gap between career aspirations and realities on the ground can trigger feelings of frustration and anxiety regarding professional futures [5].

The COVID-19 pandemic has been an extra challenge involving adjustments to online learning, policy changes, and the psychological impact of crisis situations [6], [7]. This sudden change adds a layer of complexity and can significantly increase stress levels among lecturers and staff. By understanding these factors, higher education institutions need to implement policies and supports that can help manage their employees' stress levels, creating a more balanced and sustainable work environment.

Employees in higher education institutions can also face various problems related to cultural entropy. Cultural entropy reflects the extent to which energy within an organization is used to do unproductive work or to overcome barriers in organizational culture [8]. The emergence of cultural entropy in the educational work environment can also be related to the ability of leaders to lead and manage work stress. Cultural entropy reflects the level of disharmony and barriers in organizational culture that can reduce employee performance and well-being. This research will discuss the literature on cultural entropy in an academic context and emphasize the need for a deeper understanding and effective management of cultural entropy to foster a productive and innovative work environment, especially in higher education institutions.

2. LITERATURE REVIEW

2.1 Cultural Entropy

Cultural entropy describes the extent to which energy in an organizational culture is used by employees to do work that is unproductive or does not provide added value to the organization [9], [10]. It also reflects how much conflict, obstacles, and frustrations employees face on a day-to-day basis, hinder the optimal performance of employees and the organization. Cultural entropy emerges as potential limiting values, such as bureaucracy, mutual blame, power, greed, and hierarchy [11]. Cultural entropy is influenced by the personal entropy of current leaders and the institutional legacy of past leaders embedded in organizational structures, systems, policies, and procedures. The amount of energy obtained from an organization, otherwise referred to as "value-added work" that adds value to the organization, is equivalent to the amount of energy invested in the organization, minus the amount of energy required to maintain the functionality of the organization.

When the level of dysfunction or disruption in an organization is high, employees have to expend more energy to complete their tasks. The additional energy required to complete this work is called "cultural entropy" because it is caused by factors related to organizational culture. Some of the factors that cause cultural entropy include excessive control, prudence, confusion, bureaucracy, hierarchy, internal competition, blame, and silo mentality. Employee efforts to address cultural entropy result in energy that is no longer available for value-added work. When cultural entropy is high, the energy available for value-added work decreases, and organizational performance is low. Conversely, when cultural entropy is low, the energy available for value-added work increases, and performance levels are high.

3. METHODS

This review was carried out using a bottom-up approach method and referring to

the literature to conduct a systematic literature review [12]. This methodological framework system is formed based on the analysis of systematic literature reviews located in the Scopus, Emerald, and Google Scholar databases. This method consists of four stages, namely initial information, search strategy, filtering and selection, data extraction and synthesis. Table 1 provides further explanation of each stage in this methodological framework. This approach was chosen instead of other methodological frameworks because it was one of the first to be developed by synthesizing methodological practices from a review of the systematic literature that has been published. The review was directed by four research questions:

Table 1. Methodological Framework

Phase	Description
Initial information	Preliminary information that includes research questions and methodological frameworks that guide a systematic literature review.
Search strategy	Search for articles in a predetermined journal database, written through keywords that are combined, tested, and revised if necessary.
Screening and selection	The initial screening process is carried out to assess the title and abstract of the search results. After that, the full text of the publication that passed the initial screening is re-examined (second stage screening) to determine which publication will be included in the review. All decisions taken at this stage are based on inclusion and/or exclusion criteria set by the examiner and recorded using PRISMA.
Data extraction and synthesis	A data extraction form has been compiled, tested, and updated if necessary. This form is used to retrieve important information surrounding the research question from the articles included in the literature review. Coding is done on all data extraction forms to identify themes and subthemes relevant to the research question. This process ensures that the data captured conforms to the research criteria, helping to decipher findings from the reviewed literature.

1. What is the concept of cultural entropy in organizations?
2. What are the factors that influence cultural entropy in employees?
3. What does cultural entropy have to do with leadership?
4. How is cultural entropy in higher education institutions?

Article selection and analysis

This research will be conducted in November 2023 using databases of Scopus, Emerald, and Google Scholar journals. The keywords used were "cultural entropy" AND "employee" AND "organization" OR "institution" OR "university" OR "higher education", and only journal publications from 2010-2023 were included in the analysis. Related to inclusion and exclusion criteria, all types of journal publications, including editorials, primary studies, and commentaries are included. From the search results (see Figure 1), we found 3 articles from Scopus, 1000 articles from Emerald and 598 from Google Scholar. A total of 531 articles were screened based on titles and abstracts, and 450 articles were excluded because they were not relevant to the topic. During the second stage of screening, the two authors screened the remaining 81 full-text articles independently.
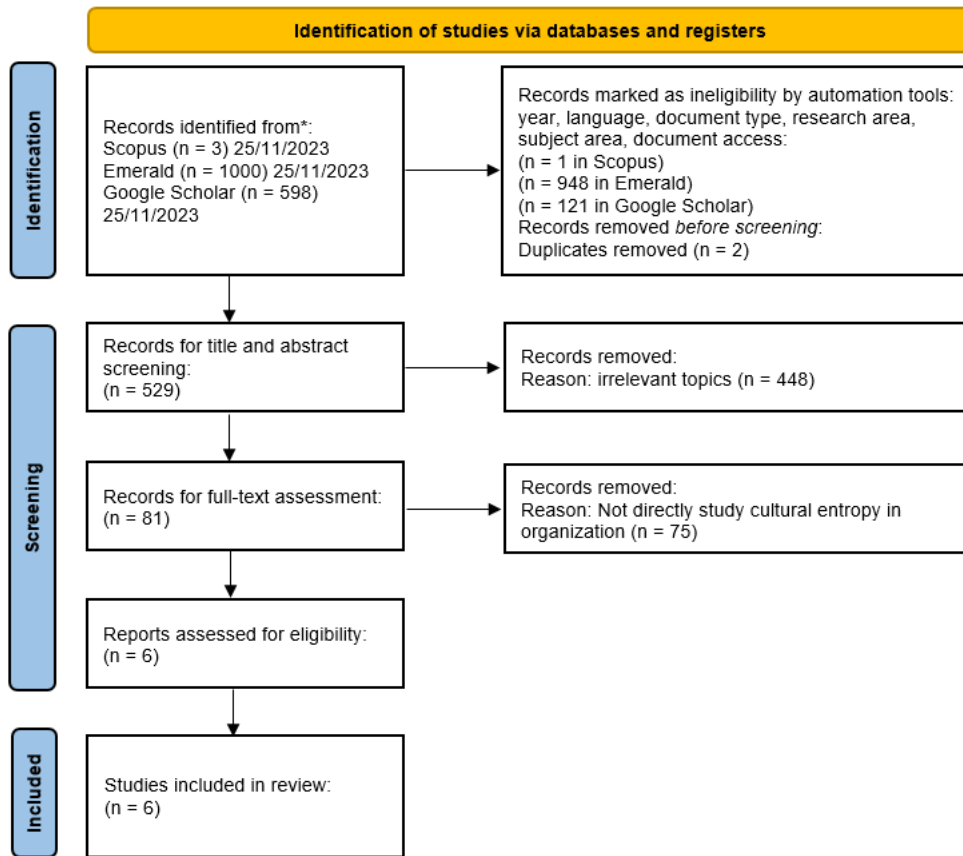
Figure 1. PRISMA diagram of the selection process

After discussion, only 6 articles met the inclusion criteria. The 75 excluded articles were not directly related to the discussion of cultural entropy in the organization. A PRISMA diagram of the selection process is shown in Figure 1, including the reasons for exclusion and the division of tasks between the two reviewers in this study. The process of data extraction and data synthesis is carried out on 7 articles included. After the data extraction form is completed, the authors synthesize the extracted data in NVivo, adopting a basic theoretical approach to qualitative data analysis [13]. Thematic categories are developed inductively, based on the author's understanding and interpretation of the data found.

4. RESULTS AND DISCUSSION

Table 2. Selected Article

Writer	Article Title	Journal	Findings
Mingaleva et al. (2022)	Organizational Culture Management as an Element of Innovative and Sustainable Development of Enterprises	Sustainability 2022, 14, 6289	When managing sustainable development, organizational culture is considered an active resource and is a key element in organizational innovation. The importance of choosing rational and adequate organizational change directions and methods is a crucial factor in achieving business sustainability. The results of the analysis show the need to make

			changes to the organizational culture that currently exists in the company.
Zabiegalski & Marquardt (2022)	Action learning and the ambidextrous organization	Journal of Work-Applied Management, 4, 2, 170-183	Ambidextrous organizations are able to maintain a balance between exploitation (through action) and exploration (through learning) by not ruling out one.
Bilal et al. (2020)	Pragmatic Impact of Cultural Entropy on the Job Satisfaction among Managers Working in Hotel Industry	Pakistan Journal of Social Sciences (PJSS), 40, 2, 1129-1138	The absence of culture within an organization and awareness of cultural entropy have a significant impact on job satisfaction and organizational success. Therefore, it is very important for organizations to pay extra attention in reducing cultural entropy and increasing employee job satisfaction.
Schmitt (2020)	Designing decentralized knowledge management systems to effectuate individual and collective generative capacities	Kybernetes, 49, 1, 22-46	The notion of generative appropriateness and capacity in technical, informational, and social interpretation has proven to be a framework that can accommodate various Knowledge Management (KM) models and cumulatively synthesize various related concepts and perspectives.
Mash et al. (2016)	How to change organisational culture: Action research in a South African public sector primary care facility	African Journal of Primary Health Care and Family Medicine, 8, 1, 1-9	Organizational culture change can be realized through participatory processes that focus on leadership style, communication, and relationship building through CVA and feedback, 360-degree LVA, feedback and coaching, and action learning in cooperative inquiry groups.
Mash et al. (2013)	An assessment of organisational values, culture and performance in Cape Town's primary healthcare services	South African Family Practice, 55, 5, 459-466	The entropy of the organization is high, especially in terms of the values that are dominant today. A change in organizational culture is needed to achieve sustainability and meet desired values.

The concept of cultural entropy in organizations

Cultural entropy, a concept developed by Richard Barrett, involves the analysis of individual values in the context of multiple countries by the Barrett Values Centre. For example, in an August 2008 study in Iceland, it was revealed that the level of cultural entropy is very high, exceeding the figure of 54% [11]. Interestingly, in just over a month, Iceland went into economic bankruptcy. Similar findings occurred in a Latvian folk study in August 2007, where cultural entropy reached 54%, and in the next two months, there was chaos and a change of government.

In this context, "culture" refers to the characteristics and values that make up the identity of an organization or nation. Entropy, a concept usually associated with physics, is defined as a state in which part of the energy produced by a system is used to overcome damage to its components [20]. In the context of organizations, imperfections such as bureaucracy, hierarchy, internal competition, dishonesty, and mutual blame, lead to the use of employee energy that would otherwise be allocated to productive work [21], referred to as "cultural entropy".

Cultural entropy in an organization can be decomposed into three main elements. First, there are factors that slow down the pace of organization and hinder quick decision making, such as bureaucracy, hierarchy, confusion, quarrels, and rigidity [22], [23]. Second, factors that create friction between employees, including internal competition, mutual blame, intimidation, and manipulation [24], [25]. Third, factors that hinder employees from working effectively, such as excessive control, excessive prudence, micromanagement, short-term focus, and territorialism [26].

Within the scope of the organization, the level of cultural entropy directly affects the level of energy that employees can contribute to the betterment of the company. When entropy is low, the energy available for productive work is high, which in turn improves organizational performance. Conversely, high cultural entropy results in wasted use of energy that would otherwise be allocated to productive work, reducing overall organizational performance. Since the emergence of the concept of cultural entropy, many researchers have begun to develop and implement it to various scopes of organizations and institutions, but no one has specifically conducted research on higher education institutions, especially higher education. This research focuses on the development and implementation of Barrett's concept of cultural entropy.

Factors Affecting Cultural Entropy in Employees

Cultural entropy refers to the amount of energy not available for useful work in an organization, measured as the degree of conflict, friction, and frustration arising from relationship problems, system inefficiencies, and value misalignments. This concept highlights dysfunctions in an organization, such as undue power, bureaucracy, inequality, internal competition, and unhealthy mindsets.

The causative factors of cultural entropy involve several aspects, such as the lack of mechanistic and organic culture in organizations, the existence of authoritarian cultures that do not support participation, the existence of subcultures and cultural dominance, the lack of a strong culture, and the lack of entrepreneurial and market cultures. All of these factors can lead to instability, employee dissatisfaction, and decreased organizational performance [14]. In line with research Bilal et al. (2020) In the hospitality industry, one important aspect of cultural entropy is bureaucratic culture which has a negative correlation with job satisfaction and commitment. Top-level leaders should direct their attention to bureaucratic administrative weaknesses, which generally arise from cultural entropy. If cultural entropy lasts for a long period of time, it can encourage unethical behavior in employees, which can trigger a negative response from top management. In addition, employees can engage in acts such as theft, fraud, intimidation, absenteeism, and sabotage.

Another contributing factor to cultural entropy is a rigid and limiting internal structure [18], [19]. It is a concern that information indivision is becoming a major value, as poor information flow increases confusion and reduces an organization's ability to adapt, transform, and build internal cohesion. Relationships within organizations are eroded by a culture of blame and manipulation. The rigidity of the internal structure will also affect the movement of information and learning in the organization. The inability of organizations to manage knowledge management for learning can be a contributing factor to cultural entropy. Action

learning and organization are ambidextrous, emphasizing the importance of learning, curiosity, and the use of questions as key elements [17]. Ambidextrous organizations are able to maintain a balance between exploitation (through action) and exploration (through learning) by not ruling out either [15].

The trend of cultural entropy reflects an increase in dysfunction in an organization if not handled properly. Problems such as excessive bureaucracy, internal competition, lack of employee involvement, and vagueness in duties and responsibilities can contribute to increased cultural entropy. Identifying and addressing these factors can help organizations reduce levels of cultural entropy and improve employee satisfaction and performance.

The Relationship of Cultural Entropy with Leadership

Of the six articles analyzed, all have in common that overcoming cultural entropy in organizations requires a leadership role that is able to provide significant change. On research Bilal et al. (2020), it is emphasized that top-level leaders need to provide adequate understanding and education about policies as well as model desirable behavior for their subordinates. Furthermore, negative culture in an organization can change through professional workforce composition, planned organizational change techniques, and other organizational culture influences. This process of organizational culture evolution begins with changes in the values, beliefs, and behaviors of leaders, and thus effectively addresses cultural entropy in the organization.

Interestingly, leaders who are able to transform action learning models also adopt a similar approach by using the power of questions to stimulate assessment, allowing learning to go hand in hand with actions in organizational performance [15], [17]. There is a close relationship between these concepts and the phenomenon of cultural entropy, where the understanding and handling of cultural entropy can be enhanced through the application of action learning principles and ambidextrous organizational approaches.

Research Mash et al. (2013, 2016) Both of which were carried out in healthcare facilities, indicated that there were many cases of cultural entropy experienced by health workers. Changes in leadership style have a key role in improving organizational culture. Managers who transition from administrative roles to leader roles are able to form a more positive organizational culture [18]. These findings highlight the importance of leadership transformation in shaping a healthy organizational culture.

Research Schmitt (2020) It does not directly link cultural entropy with leadership, but focuses on the formation of knowledge management. It concluded that in favor of participation In organizations through knowledge management, personal knowledge that has been digitized must remain owned and accessible to its owner or entitled co-workers. This is important so that information remains consistent, transparent, secure, and independent of changes in social, educational, professional, or technological environments.

Based on the six articles studied, the ability of leaders to exert a strong and innovative, positive and inspiring influence, manage knowledge management and learning, becomes a very much needed thing in organizations. The transformational leadership style is focused on creating significant change within the organization or group, while inspiring and helping team members reach their full potential.

Cultural Entropy in Higher Education Institutions

Research related to cultural entropy in organizations is still relatively small, especially in organizations or higher education institutions. If you look at the research Mash et al. (2013, 2016) What is done to health workers, both doctors, nurses, and other employees in healthcare facilities, there are restrictions, such as controls, cost reductions, long working hours, confusion, and lack of information. These factors indicate

a serious problem, thus indicating cultural entropy.

Doctors and lecturers, despite being in different fields of profession, have some similarities, especially in the context of education and community service. Within the scope of job demands as employees in organizations, both professions, doctors, and lecturers, share similarities in several crucial aspects. The first aspect is high intellectual demands and professionalism. As doctors, the imperative to constantly update medical knowledge in accordance with the development of health sciences confirms significant intellectual demands. So do lecturers, who must stay current with scientific and technological advances in their academic fields [27], while maintaining high standards of professionalism in providing teaching and contributing to the academic community [28].

Second, there are administrative responsibilities that must be carried out by both professions. Although the primary focus of physicians is to provide direct care to patients, they must also address administrative responsibilities such as recording medical history and participation in hospital policies. Meanwhile, lecturers are involved in administrative tasks such as lecture schedule management, student assessment, and attendance at department meetings or academic committees.

Team collaboration is the third aspect that is similar among doctors and lecturers. Doctors work in multidisciplinary teams in healthcare settings, coordinating with a variety of healthcare professionals. Conversely, lecturers can also be found working in teams, especially in curriculum development, joint research projects, or institutional initiatives. Fourth, both doctors and lecturers face demand to update their skills and knowledge. Physicians must keep their medical skills updated as medical science evolves, while lecturers must remain relevant to the current literature and practices in their disciplines.

The fifth aspect is a commitment to professional ethics and standards. Doctors must adhere to medical ethics, maintain patient confidentiality, and provide quality health care. Similarly, lecturers are expected to adhere to academic ethics, including research integrity, fairness in academic assessment, and maintaining standards of professionalism in relationships with students and colleagues. Finally, both doctors and lecturers are faced with demands for responsibility towards students or patients. Doctors must take responsibility for the health and safety of patients, providing safe and effective care. In contrast, lecturers have a responsibility for student success and development, as well as providing quality teaching to support their academic progress.

Based on the similar characteristics of doctors and lecturers from the demands of work as employees in organizations, there are indications of similarities in cultural entropy issues. Cultural entropy research in higher education institutions, especially higher education, is a topic that is still rarely researched and very interesting to discuss. Understanding and handling cultural entropy is key to improving employee performance and achieving organizational success in higher education institutions. Targeted cultural transformation can have a positive impact in shaping a productive, innovative, and long-term growth work environment of an organization.

5. CONCLUSION

Cultural entropy, as a concept introduced by Richard Barrett, addresses the degree to which cultural imperfections within an organization affect employee performance and, ultimately, the entire organization. Through various case studies, especially in the health sector and higher education institutions, it was revealed that factors such as excessive bureaucracy, lack of information vagueness, and lack of employee engagement can be triggers for high cultural entropy. Transformational leadership is emerging as a key element in overcoming cultural entropy, with leaders capable of leading change, shaping positive organizational cultures, and stimulating action learning. Although cultural

entropy in higher education institutions, especially higher education levels, is still a limited area of research, understanding and addressing cultural entropy is considered key to achieving a productive and innovative work environment, as well as supporting the long-term growth of organizations.

REFERENCES

[1]   L. E. Robinson *et al.*, "Teachers, Stress, and the COVID-19 Pandemic: A Qualitative Analysis," *School Ment. Health*, vol. 15, pp. 78–89, 2023, doi: 10.1007/s12310-022-09533-2.

[2]   G. Arbia, A. Carbone, I. Stanzione, and G. Szpunar, "The Work-Related Stress and Well-Being of Teachers—An Exploratory Study within Primary Schools in Italy," *Educ. Sci.*, vol. 13, no. 5, 2023, doi: 10.3390/educsci13050505.

[3]   I. Jácome and S. Chión, "Psychological Empowerment and Job Stress in Higher Education Institutions in Ecuador," *Psychol. Res. Behav. Manag.*, vol. 15, no. November, pp. 3297–3312, 2022, doi: 10.2147/PRBM.S381342.

[4]   P. Woelert, "Administrative burden in higher education institutions: a conceptualisation and a research agenda conceptualisation and a research agenda," *J. High. Educ. Policy Manag.*, vol. 45, no. 4, pp. 409–422, 2023, doi: 10.1080/1360080X.2023.2190967.

[5]   N. Aliane *et al.*, "How Job Insecurity Affects Innovative Work Behavior in the Hospitality and Tourism Industry? The Roles of Knowledge Hiding Behavior and Team Anti-Citizenship Behavior," *Sustain.*, vol. 15, no. 18, pp. 1–22, 2023, doi: 10.3390/su151813956.

[6]   C. Coman, L. G. Țîru, L. Meseșan-Schmitz, C. Stanciu, and M. C. Bularca, "Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective," *Sustain.*, vol. 12, no. 24, pp. 1–22, 2020, doi: 10.3390/su122410367.

[7]   S. Pokhrel and R. Chhetri, "A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning," *High. Educ. Futur.*, vol. 8, no. 1, pp. 133–141, 2021, doi: 10.1177/2347631120983481.

[8]   Barrett Values Centre, "The Cultural Entropy® Score," 2023.

[9]   R. Barrett, *The values-driven organization: Cultural health and employee well-being as a pathway to sustainable performance*. books.google.com, 2017.

[10]   R. Barrett, *The values-driven organization: Unleashing human potential for performance and profit*. books.google.com, 2013.

[11]   R. Barret, "High Performance: It's all about entropy," *Barrett Values Cent.*, pp. 1–11, 2010.

[12]   S. W. Chong, T. J. Lin, and Y. Chen, "A methodological review of systematic literature reviews in higher education: Heterogeneity and homogeneity," *Educ. Res. Rev.*, vol. 35, p. 100426, Feb. 2022, doi: 10.1016/J.EDUREV.2021.100426.

[13]   K. Charmaz, "Grounded Theory in Global Perspective: Reviews by International Researchers," *Qual. Inq.*, vol. 20, no. 9, pp. 1074–1084, 2014, doi: 10.1177/1077800414545235.

[14]   Z. Mingaleva, E. Shironina, E. Lobova, V. Olenev, L. Plyusnina, and A. Oborina, "Organizational culture management as an element of innovative and sustainable development of enterprises," *Sustainability*, vol. 14, no. 6289, pp. 1–28, 2022.

[15]   E. Zabiegalski and M. J. Marquardt, "Action learning and the ambidextrous organization," *J. Work. Manag.*, vol. 14, no. 2, pp. 170–183, 2022, doi: 10.1108/JWAM-11-2021-0062.

[16]   H. Bilal, S. Ali, and M. Waseem, "Pragmatic Impact of Cultural Entropy on the Job Satisfaction among Managers Working in Hotel Industry," *Pakistan J. Soc. Sci.*, vol. 40, no. 2, pp. 1129–1138, 2020.

[17]   U. Schmitt, "Designing decentralized knowledge management systems to effectuate individual and collective generative capacities," *Kybernetes*, vol. 49, no. 1, pp. 22–46, 2020, doi: 10.1108/K-03-2019-0215.

[18]   R. Mash, A. De Sa, and M. Christodoulou, "How to change organisational culture: Action research in a South African public sector primary care facility," *African J. Prim. Heal. Care Fam. Med.*, vol. 8, no. 1, pp. 1–9, 2016, doi: 10.4102/phcfm.v8i1.1184.

[19]   R. Mash, S. Govender, A. A. Isaacs, A. De Sa, and A. Schlemmer, "An assessment of organisational values, culture and performance in Cape Town's primary healthcare services," *South African Fam. Pract.*, vol. 55, no. 5, pp. 459–466, 2013.

[20]   A. Ben-Naim, "Entropy and Time," *Entropy*, vol. 22, no. 4, 2020, doi: 10.3390/E22040430.

[21]   T. Kåberger and B. Månsson, "Entropy and economic processes - Physics perspectives," *Ecol. Econ.*, vol. 36, no. 1, pp. 165–179, 2001, doi: 10.1016/S0921-8009(00)00225-1.

[22]   K. Parpiev, "Overemphasis on Hierarchy and Bureaucracy, Leading to Slow Decision-Making and a Lack of Agility," *SSRN Electron. J.*, 2023, doi: https://dx.doi.org/10.2139/ssrn.4361544.

[23]   M. Rogers, "Bureaucratic structures and organizational performance: A comparative study of Kampala capital city authority and national planning authority," *J. Public Adm. Policy Res.*, vol. 9, no. 1, pp. 1–16, 2017, doi: 10.5897/jpapr2016.0377.

[24]   A. R. Overton and A. C. Lowry, "Conflict management: Difficult conversations with difficult people," *Clin. Colon Rectal Surg.*, vol. 26, no. 4, pp. 259–264, 2013, doi: 10.1055/s-0033-1356728.

[25]   J. G. Almeida, D. N. D. Hartog, A. H. B. De Hoogh, V. R. Franco, and J. B. Porto, "Harmful Leader Behaviors: Toward an Increased Understanding of How Different Forms of Unethical Leader Behavior Can Harm Subordinates," *J. Bus. Ethics*, vol. 180, no. 1, pp. 215–244, 2021, doi: 10.1007/s10551-021-04864-7.

[26]   J. Lee, S. Ahn, M. A. Henning, J. M. M. van de Ridder, and V. Rajput, "Micromanagement in clinical supervision: a

scoping review," *BMC Med. Educ.*, vol. 23, no. 1, pp. 1–14, 2023, doi: 10.1186/s12909-023-04543-3.

[27]   S. Grassini, "Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings," *Educ. Sci.*, vol. 13, no. 7, 2023, doi: 10.3390/educsci13070692.

[28]   L. Darling-Hammond, L. Flook, C. Cook-Harvey, B. Barron, and D. Osher, "Implications for educational practice of the science of learning and development," *Appl. Dev. Sci.*, vol. 24, no. 2, pp. 97–140, 2020, doi: 10.1080/10888691.2018.1537791.