

**APPLICATION OF ANALYTIC HIERARCHY PROCESS (AHP) IN EVALUATING
EDUCATIONAL LEADERSHIP THEORIES FOR EFFECTIVE SCHOOL
MANAGEMENT**

Assist. Prof. Filiz MIZRAK¹
Assist. Prof. Murat CULDUZ²

ABSTRACT

Educational institutions are dynamic environments that require effective leadership to ensure optimal functioning and student success. This study aims to explore and evaluate various educational leadership theories using the Analytic Hierarchy Process (AHP), a multi-criteria decision-making technique. By conducting expert interviews, this research identifies the key criteria that educational leaders consider vital for successful school management. The AHP methodology is employed to assign weights to these criteria and rank different educational leadership theories based on their alignment with these criteria. This study not only contributes to the selection of suitable leadership theories for educational settings but also showcases the practical applicability of AHP in educational research. This study's results underscore the significance of customizing leadership approaches, like transformational and distributed leadership, to suit the specific requirements of educational institutions, by revealing the intricate relationship between educational leadership theories and effective school management criteria, such as visionary leadership, student engagement, effective communication, innovation, and collaborative decision-making.

Keywords: Leadership Theories, Education, School Management, AHP

¹ Beykoz Üniversitesi, ORCID ID: 0000-0002-3472-394X, flzmizrak@gmail.com

² İstanbul Medipol Üniversitesi, ORCID ID: 0000-0002-9298-4339, mculduz@medipol.edu.tr

Arařtırma Makalesi/Research Article, Geliř Tarihi/Received: 29/08/2023–Kabul Tarihi/Accepted: 02/10/2023

EĞİTİM LİDERLİK TEORİLERİNİN ETKİLİ OKUL YÖNETİMİ İÇİN DEĞERLENDİRİLMESİNDE ANALİTİK HİYERARŞİ SÜRECİ (AHP) UYGULAMASI

Dr. Öğr. Üyesi Filiz MIZRAK
Dr. Öğr. Üyesi Murat CULDUZ

ÖZET

Özet Eğitim kurumları, optimal işleyiş ve öğrenci başarısı sağlamak için etkili liderliğe ihtiyaç duyan dinamik ortamlardır. Bu çalışma, Analitik Hiyerarşi Süreci (AHP), çok kriterli karar verme tekniği kullanarak çeşitli eğitim liderlik teorilerini araştırmayı ve değerlendirmeyi amaçlamaktadır. Uzman görüşmeleri gerçekleştirerek, bu araştırma, eğitim liderlerinin başarılı okul yönetimi için önemli gördükleri ana kriterleri belirlemektedir. AHP metodolojisi, kriterlere ağırlıklar atamak ve farklı eğitim liderlik teorilerini kriterlere uygunluğa göre sıralamak için kullanılmaktadır. Bu çalışma, sadece eğitim ortamları için uygun liderlik teorilerinin seçimine katkı sağlamakla kalmaz, aynı zamanda AHP'nin eğitim araştırmalarında pratik uygulanabilirliğini de göstermektedir. Çalışmanın sonuçları, eğitim kurumlarının özel gereksinimlerine uygun liderlik yaklaşımlarını, vizyoner liderlik, öğrenci katılımı, etkili iletişim, yenilikçilik ve işbirlikçi karar alma gibi etkili okul yönetimi kriterleri ile eğitim liderlik teorileri arasındaki karmaşık ilişkiyi ortaya çıkarmaktadır.

Anahtar Kelimeler: Liderlik Teorileri, Eğitim, Okul Yönetimi, AHP

1. INTRODUCTION

In the complex landscape of educational institutions, effective leadership stands as a pivotal force driving optimal functioning and student success. The intricate interplay of diverse stakeholders, evolving pedagogical paradigms, and ever-changing societal demands necessitates adept leadership that can navigate the dynamic challenges inherent to educational environments. Educational leaders are entrusted with the task of shaping not only the academic landscape but also the broader developmental trajectories of students, educators, and the institution as a whole (Kemethofer, Helm, & Warwas, 2022).

The significance of leadership within the educational domain has led to the emergence of numerous leadership theories, each offering distinct perspectives on how to best guide and manage educational institutions. The choice of an appropriate leadership theory becomes crucial in ensuring that the institution's goals are met, the faculty is motivated, and students are provided with a conducive learning environment. These theories encompass a spectrum of approaches, from transformational leadership that emphasizes inspiration and vision to servant leadership that underscores service to others and shared decision-making. However, selecting the most fitting leadership theory for a specific educational setting is far from a trivial task (Yokuş, 2022).

This study sets out to delve into the realm of educational leadership theories, aiming to contribute a systematic approach to their evaluation and selection for effective school management. To achieve this goal, the study employs the Analytic Hierarchy Process (AHP), a robust multi-criteria decision-making technique. AHP provides a structured framework to compare and prioritize complex alternatives based on a set of predefined criteria. By harnessing the power of expert insights and systematically weighing key criteria, this research seeks to provide educational leaders, policymakers, and researchers with an objective method for evaluating leadership theories within the intricate context of educational institutions.

The subsequent sections of this study will delve into the contextual landscape of educational institutions, the importance of leadership theories in enhancing their performance, and a comprehensive overview of the Analytic Hierarchy Process. Through the utilization of AHP, this study endeavors not only to advance the understanding of leadership theory selection but also to illuminate the practical applicability of a sophisticated decision-making tool in the realm of educational research.

In summary, the confluence of effective leadership and educational institutions is a dynamic and critical junction. This study aspires to illuminate this intersection by evaluating educational leadership theories through the lens of the Analytic Hierarchy Process, offering a structured methodology to inform the choices that underpin successful school management, ultimately contributing to the advancement of educational excellence.

2. LITERATURE REVIEW

The literature review section of this study will delve into the multifaceted landscape of educational leadership theories and their pivotal role in effective school management. In this comprehensive exploration, an overview of prominent educational leadership theories will be provided, shedding light on their key principles and applications within the educational context. Subsequently, the critical importance of selecting the most fitting leadership theories to ensure efficient school management will be emphasized. To bring a quantitative dimension to the investigation, the Analytic Hierarchy Process (AHP) and its widespread applications across various fields will be introduced. Lastly, previous studies that have applied AHP in educational contexts, focusing on its utility in evaluating leadership theories will be delved into. Through this literature review, a strong foundation for the research will be built, highlighting the interconnectedness of leadership theories, effective school management, and the analytical power of the AHP methodology.

2.1. Overview of Prominent Educational Leadership Theories

The landscape of educational leadership theories is rich and diverse, reflecting the multifaceted nature of leadership within the realm of education. These theories provide valuable frameworks for understanding and guiding leadership practices that can shape the trajectory of educational institutions. This section provides an overview of some prominent educational leadership theories, shedding light on their fundamental tenets and contributions.

2.1.1. Transformational Leadership

Transformational leadership is a leadership theory that places a strong emphasis on the transformative power of leaders to inspire and elevate their followers to achieve remarkable outcomes. Coined by James MacGregor Burns, this theory centers around the leader's ability to effect profound change through their vision, charisma, and ability to create a sense of shared purpose among their team (Riswanti Rini, 2022).

Key Characteristics (Burns, 2004);

- **Visionary Leadership:** Transformational leaders articulate a clear and compelling vision for the future, one that goes beyond the status quo and inspires followers to reach for higher goals.
- **Inspirational Motivation:** These leaders employ powerful communication skills to motivate and energize their team members. They use passion, optimism, and encouragement to boost morale and engagement.
- **Intellectual Stimulation:** Transformational leaders encourage innovation and creativity among their followers. They challenge conventional thinking and create an environment where new ideas are welcomed and explored.
- **Individualized Consideration:** These leaders recognize the unique strengths and needs of each team member. They provide individualized support, mentorship, and guidance to help each person reach their full potential.

Impact in Educational Settings

In educational contexts, transformational leadership can yield significant positive outcomes (Riswanti Rini, 2022);

- **Enhanced Student Achievement:** Transformational leaders inspire educators to go beyond routine teaching, fostering an environment where students are motivated to excel academically and personally.
- **Positive School Culture:** These leaders can cultivate a culture of collaboration, mutual respect, and open communication among educators, students, and parents.
- **Teacher Development:** Transformational leaders prioritize the growth and professional development of their staff, encouraging continuous learning and improvement.

- **Innovation in Pedagogy:** By encouraging innovative thinking, transformational leaders drive the adoption of new teaching methods and technologies that enhance the learning experience.

Challenges (Meng,2022);

- Transformational leadership might require a significant investment of time and energy from leaders, which can be challenging in fast-paced educational environments.
- The success of this leadership style is contingent on the leader's ability to effectively communicate and connect with diverse groups of people.

In summary, transformational leadership holds the potential to create lasting and positive change within educational institutions. By fostering a culture of inspiration, innovation, and shared purpose, transformational leaders can drive both personal growth and organizational advancement, contributing to the success of educators and students alike.

2.1.2. Servant Leadership

Servant leadership is a philosophy of leadership that revolves around the idea of leaders being servants first. This theory, popularized by Robert K. Greenleaf, challenges traditional notions of leadership by emphasizing a leader's responsibility to serve and support the needs of their team members. Rather than focusing solely on positional power and authority, servant leaders prioritize the growth and well-being of their followers (Turner, 2022).

Key Characteristics (Greenleaf, 2002);

- **Service Orientation:** Servant leaders place the needs of their team members above their own. They actively seek opportunities to support, mentor, and empower their followers.
- **Empathy:** Understanding and empathizing with the challenges and aspirations of team members is a fundamental aspect of servant leadership. Leaders with empathy can provide meaningful guidance and support.
- **Listening Skills:** Servant leaders are attentive listeners who actively seek input and feedback from their team. They create an open and safe space for dialogue and collaboration.
- **Shared Decision-Making:** These leaders involve their team members in decision-making processes, valuing their input and perspectives. Decisions are made collectively to ensure buy-in and a sense of ownership.

Impact in Educational Settings:

Servant leadership has several significant implications when applied to educational institutions (Turner, 2022);

- **Teacher-Student Relationships:** Servant leaders foster strong connections between educators and students by prioritizing their needs and creating a nurturing learning environment.
- **Collaborative Culture:** This leadership style encourages collaboration among educators, administrators, and other stakeholders, fostering an inclusive and supportive organizational culture.
- **Open Communication:** Servant leaders create an atmosphere of open communication where concerns and ideas are freely shared. This transparency enhances trust and understanding.
- **Student Success:** By focusing on the well-being of educators, servant leaders indirectly contribute to improved student outcomes, as motivated and supported educators are more effective in their roles.

Challenges (Al-Asfour et al., 2022);

- The servant leadership approach can be perceived as overly focused on the needs of individuals, potentially neglecting broader organizational goals.
- Finding a balance between serving the needs of followers and making critical decisions can be challenging, particularly in situations that require swift action.

In summary, servant leadership challenges the traditional top-down leadership model by emphasizing the importance of nurturing and supporting those under leadership. In educational settings, this approach can cultivate an environment of empathy, collaboration, and mutual respect, ultimately enhancing both the well-being of educators and the quality of education provided to students.

2.1.3. Distributed Leadership

Distributed leadership is a contemporary leadership theory that stands in contrast to traditional top-down leadership models. This approach acknowledges that leadership is not limited to a singular figure at the top of the hierarchy; rather, leadership is a collective endeavor that involves multiple individuals contributing their expertise and influence. Distributed leadership recognizes the diverse strengths and insights present across an organization, including educational institutions, and leverages these talents to create a more responsive and effective leadership structure (Bektaş, Kılınç & Gümüş, 2022).

Key Characteristics (Shava & Tlou, 2018);

- **Shared Responsibility:** In distributed leadership, leadership responsibilities are shared among various individuals throughout the organization, regardless of their formal positions. Each person contributes their unique skills and knowledge to contribute to the organization's success.

- **Expertise Utilization:** This approach capitalizes on the diverse expertise of individuals, enabling the organization to tap into a broader range of perspectives and solutions.
- **Collaboration:** Distributed leadership fosters collaboration and teamwork among different stakeholders. Decision-making processes are more inclusive and involve a wider array of voices.
- **Adaptability:** The shared leadership model is inherently adaptable to change. As leadership is not dependent on a single leader, the organization can better respond to evolving challenges and opportunities.

Impact in Educational Settings

Distributed leadership has several implications when applied to educational institutions (Flessa, 2009);

- **Teacher Empowerment:** Educators are empowered to take on leadership roles in areas where they possess expertise, leading to a more enriched learning environment.
- **Inclusive Decision-Making:** By involving various stakeholders—such as teachers, administrators, students, and parents—in decision-making, distributed leadership ensures a more comprehensive and balanced approach to problem-solving.
- **Continuous Improvement:** The collective nature of distributed leadership facilitates ongoing learning and improvement. Feedback loops are enhanced, leading to iterative refinement of processes and practices.
- **Responsive Problem-Solving:** With leadership distributed throughout the organization, challenges can be addressed more quickly and effectively as a wider pool of individuals contribute ideas and solutions.

Challenges (Bektaş, Kılınç, & Gümüş, 2022);

- Distributed leadership may require a shift in organizational culture, as individuals accustomed to traditional leadership models may need to adapt to a more collaborative approach.
- Ensuring clear communication and coordination among distributed leaders is essential to prevent conflicts and ensure alignment.

Distributed leadership challenges the notion of a single leader holding all decision-making power by harnessing the capabilities of various individuals across an organization. In educational settings, this approach promotes collaboration, innovation, and adaptability, resulting in a more holistic and effective leadership structure that is well-equipped to meet the complex challenges of education in the 21st century.

2.1.4. Transactional Leadership

Transactional leadership is a pragmatic and results-oriented leadership theory that emphasizes the use of rewards and punishments to motivate followers. This theory is rooted in the concept of a "transaction," where leaders establish clear expectations and provide incentives for achieving desired outcomes. Transactional leaders operate within structured systems and procedures to ensure accountability and efficiency (Purwanto et al., 2020).

Key Characteristics (Erdel & Takkaç, 2020);

- **Clear Expectations:** Transactional leaders set explicit performance expectations for their team members. These expectations often revolve around specific goals, tasks, and standards.
- **Rewards and Punishments:** This leadership style relies on a system of rewards and punishments to influence behavior. Rewards can range from tangible incentives (e.g., bonuses, promotions) to intangible ones (e.g., recognition, praise). Conversely, punishments can involve consequences for not meeting expectations.
- **Structured Systems:** Transactional leaders implement structured systems and processes to streamline workflow and ensure consistency. These systems help maintain order and predictability.
- **Task-Oriented:** The focus of transactional leadership is on achieving tasks and goals efficiently. This style is well-suited to situations where precise execution is crucial.

Impact in Educational Settings

Transactional leadership has several implications when applied to educational institutions (Da'as, 2020).

- **Goal Achievement:** Clear expectations and rewards motivate educators and students to achieve specific academic and behavioral goals.
- **Structured Learning Environment:** Transactional leadership can contribute to the establishment of a structured and disciplined learning environment, which can be particularly effective in maintaining order and managing large groups of students.
- **Accountability:** The emphasis on rewards and consequences promotes accountability among educators and students, ensuring that commitments are fulfilled.
- **Stability:** In educational settings where consistency is vital, transactional leadership can provide a stable framework for achieving objectives.

Challenges (Da'as, 2020);

- Transactional leadership may not be conducive to fostering creativity and innovation, as the focus is primarily on meeting established benchmarks.

- Overemphasis on rewards and punishments can sometimes lead to a narrow focus on extrinsic motivation, potentially diminishing intrinsic motivation.

Transactional leadership offers a pragmatic approach to leadership that is particularly effective in environments where clarity, efficiency, and accountability are paramount. While it may not be as transformative as other leadership theories, its structured approach can provide stability and predictability in educational settings, ensuring that specific goals and objectives are met effectively.

2.1.5. Authentic Leadership

Authentic leadership is a contemporary leadership theory that places a strong emphasis on the alignment of a leader's actions with their core values, principles, and beliefs. At its core, authentic leadership is about being genuine, transparent, and true to oneself while guiding others. This approach promotes trust, open communication, and ethical behavior, fostering an environment of empowerment and engagement among followers (Hanaysha, 2022).

Key Characteristics (Akhtar et al., 2022);

- **Core Values Alignment:** Authentic leaders prioritize self-awareness and introspection to identify their core values and beliefs. They make conscious efforts to align their actions with these values, promoting congruence between their words and deeds.
- **Transparency and Honesty:** Authentic leaders communicate openly and honestly with their followers. They share their thoughts, feelings, and vulnerabilities, creating an atmosphere of trust and authenticity.
- **Empowerment and Collaboration:** These leaders empower their followers by providing them with autonomy, decision-making authority, and opportunities for personal growth. Collaboration and shared decision-making are fundamental aspects of authentic leadership.
- **Ethical Behavior:** Authentic leaders uphold high ethical standards and model ethical behavior. They make principled decisions even when facing difficult choices.

Impact in Educational Settings

When applied to educational institutions, authentic leadership can have several positive effects (Hanaysha, 2022);

- **Positive Organizational Culture:** Authentic leaders foster a culture of trust, respect, and open communication. This leads to a more positive and supportive environment for educators, students, and other stakeholders.
- **Enhanced Teacher-Student Relationships:** Authentic leadership promotes genuine connections between educators and students. This can lead to improved rapport, better communication, and increased student engagement.

- **Personal Growth:** By encouraging self-awareness and personal growth, authentic leaders create an environment where both educators and students are motivated to develop their skills and reach their potential.
- **Ethical Learning Environment:** Authentic leaders model ethical behavior, guiding students toward developing strong moral values and ethical decision-making skills.

Challenges (Alazmi & Al-Mahdy,2022);

- Authentic leadership requires a deep level of self-awareness and introspection, which can be challenging for some individuals.
- Striking a balance between openness and maintaining appropriate professional boundaries can be complex.

In summary, authentic leadership is about leading with integrity, honesty, and a commitment to one's core values. In educational settings, this approach can contribute to the establishment of a culture of trust, collaboration, and personal growth, ultimately fostering an environment where educators and students can thrive both personally and academically.

2.2. Importance of Selecting Appropriate Leadership Theories for Effective School Management

The selection of appropriate leadership theories for effective school management holds immense significance. These theories serve as guiding frameworks that shape the organizational culture, practices, and outcomes within educational institutions. When leadership theories align with the institution's core values and goals, they provide a sense of purpose and coherence, enabling the community to work collectively toward shared objectives. Moreover, leadership theories have a profound impact on the culture within schools, influencing how educators, students, and stakeholders interact and collaborate (Da'as, 2020). A leadership approach that fosters collaboration, for instance, can create a culture of teamwork and mutual support, enhancing overall morale and satisfaction. Additionally, the chosen leadership theories directly impact teacher motivation and engagement, crucial factors in promoting effective teaching and learning. When leadership emphasizes teacher professional growth and recognition, it contributes to higher levels of job satisfaction and commitment among educators (Hanaysha, 2022).

Furthermore, the implications extend to student success and achievement. Leadership theories influence the learning environment, affecting student engagement, motivation, and overall academic outcomes. The application of leadership approaches that prioritize personalized learning, student support, and inclusivity can contribute to holistic student development. As educational institutions operate within dynamic contexts, leadership theories that encourage innovation and adaptability become vital for navigating evolving challenges. Schools need to be equipped to embrace new pedagogical methods, technologies, and educational trends, and the selected leadership theories should reflect a readiness for change and improvement (Daing & Mustapha, 2023).

Importantly, the role of leadership theories extends to the long-term sustainability and success of educational institutions. Leadership approaches that emphasize ethical behavior, stakeholder engagement, and continuous improvement contribute to the establishment of enduring educational environments that positively impact students over generations. In essence, the choice of leadership theories is not merely an intellectual exercise; it directly influences the well-being, growth, and achievement of the institution, its educators, and its students (Alazmi & Al-Mahdy, 2022). By selecting leadership theories that align with the institution's values and educational philosophy, school administrators contribute to creating an environment that nurtures learning, collaboration, and achievement while fostering a culture of integrity and innovation.

2.3. Analytic Hierarchy Process (AHP) and its Applications in Various Fields

The Analytic Hierarchy Process (AHP) is a powerful decision-making methodology developed by Thomas L. Saaty in the 1970s that has found widespread application in diverse fields. AHP provides a structured framework for evaluating complex decisions by systematically analyzing and prioritizing multiple criteria and alternatives. Its unique ability to handle subjective judgments while maintaining a rigorous mathematical foundation has made it a popular tool for decision support in various contexts. At its core, AHP involves breaking down complex decisions into a hierarchical structure of criteria and sub-criteria, forming a visual representation of the decision problem. Decision-makers then engage in pairwise comparisons, evaluating the relative importance of criteria and alternatives using subjective judgments. These judgments are transformed into numerical values that reflect the decision-maker's preferences (Saaty, 1990).

The AHP process incorporates mathematical calculations to synthesize the judgments provided during pairwise comparisons. Eigenvalue computations and consistency checks ensure that the judgments are coherent and consistent. Once the calculations are completed, AHP produces a set of numerical weights that represent the relative importance of criteria and alternatives. These weights are used to rank alternatives and make informed decisions (Barcelona, 2020).

AHP's versatility has led to its widespread application in various fields, including business, engineering, healthcare, environmental management, and public policy. It has been used to solve complex problems such as project selection, resource allocation, supplier evaluation, and risk assessment. In healthcare, AHP aids in prioritizing medical treatments, while in urban planning, it assists in evaluating sustainable development projects. Its ability to handle multi-criteria decision-making and incorporate qualitative as well as quantitative inputs has made it a go-to method for addressing intricate decision challenges (Rahmayanti et al., 2021).

As this study focuses on the application of AHP in evaluating educational leadership theories for effective school management, it underscores the adaptability of AHP to educational research. By harnessing expert insights and systematically weighting criteria, AHP offers an objective and structured approach to comparing leadership theories, aligning them with the unique

needs and priorities of educational settings. This application of AHP showcases its potential to enhance decision-making processes and contribute to the advancement of educational practices, underscoring the practical significance of this methodology in the field of education.

2.4. Previous Studies Applying AHP in Educational Contexts and Leadership Theory Evaluation

The following literature table provides a comprehensive overview of a diverse range of studies that have employed the Analytic Hierarchy Process (AHP) methodology to address various challenges and topics within educational contexts and leadership theory evaluation. AHP, a prominent multiple decision-making algorithm, has been utilized in these studies to offer insights, rankings, and prioritization of factors, ultimately contributing to informed decision-making and enhanced practices. The studies discussed cover a spectrum of educational themes, from quality action researches in teaching and learning processes to leadership style evaluation, curriculum design optimization, higher education reform assessment, and much more. Each study contributes unique insights and applications of AHP, showcasing its versatility in addressing complex educational and leadership-related issues. Through this compilation, readers can gain a deeper understanding of the transformative impact of AHP in shaping educational strategies, enhancing leadership practices, and improving the overall quality of educational institutions and systems.

Table 1: Literature Table on Studies Applying AHP in Educational Contexts and Leadership Theory

Reference	Title	Summary
Barcelona (2020)	An Analytic Hierarchy Process for Quality Action Researches in Education.	Explores evaluation criteria for quality action researches in education using the Analytic Hierarchy Process (AHP). Quality action researches are highlighted for their contributions to theory and practice, actionability, and reflexivity among researchers and participants.
Kahya & Pabuçcu (2015)	Evaluating leadership styles within Rensis Likert's system-4 model using fuzzy AHP approach.	Uses fuzzy AHP to evaluate leadership styles in the context of Rensis Likert's System-4 Model, finding that participative group leadership is preferred among academic managers.
Tang (2011)	Optimizing an immersion ESL curriculum using AHP.	Utilizes AHP to optimize an immersion ESL curriculum for elementary school students in Taiwan, contributing to curriculum design and evaluation of ESL programs.
Raharjo (2007)	Methodology to improve higher education quality using QFD and AHP.	Combines Quality Function Deployment (QFD) and AHP to enhance higher education quality by translating customer needs into strategies, specifically addressing lecturers, students, and employers.
Fahim (2021)	Sustainable higher education reform quality assessment using SWOT analysis	Integrates SWOT analysis, AHP, and entropy models to assess and rank key factors for

	with integration of AHP and entropy models.	sustainable higher education reform in Morocco.
Alhosani (2015)	Criteria Decision Making Model For Evaluating The Effectiveness Of School Administration For Senior Students In Abu Dhabi Public Schools.	Focuses on evaluating school administration effectiveness using AHP, targeting senior students in Abu Dhabi public schools.
Pham, et al. (2021)	Research on knowledge management models at universities using fuzzy AHP.	Applies fuzzy AHP to assess knowledge management models at universities, identifying key factors for effective knowledge management.
Colace, et al. (2006)	Evaluation models for e-learning platform: an AHP approach.	Develops an AHP-based evaluation model for selecting e-learning platforms, addressing criteria such as curriculum design, teaching staff, and student cognition.
Liu (2016)	Prioritizing criteria for evaluating cultural contents in EFL textbooks through AHP.	Utilizes AHP to prioritize criteria for evaluating cultural contents in English as a Foreign Language (EFL) textbooks, emphasizing intercultural competence and student participation.
Tantranont & Sawatdeenarunat (2023)	School Management for Sustainable Development in Energy and Environmental Excellence.	Applies SWOT and AHP methods to develop school strategies and leadership practices for achieving sustainable development goals in Thailand's higher education system.
Aluç & Akdağ (2022)	Finding More Effective Leadership Style in Quality Management Using AHP Method.	Investigates the effectiveness of transformational leadership styles in quality management using AHP, identifying the importance of different behavioral components.
Cheng (2022)	Evaluation Method of Ideological and Political Classroom Teaching Quality Based on AHP.	Constructs an evaluation model for assessing ideological and political classroom teaching quality using AHP, providing guidelines for improving teaching effectiveness.
Mu, et al. (2022)	Development of a Framework to Assess Challenges to Virtual Education in an Emergency Remote Teaching Environment.	Utilizes qualitative and AHP approaches to identify and assess challenges faced by students in emergency remote teaching environments due to the COVID-19 pandemic.
Wang (2022)	Performance Evaluation and Management Method of Music Tutoring Schools Based on AHP.	Develops a performance evaluation model for music tutoring schools using AHP, offering a framework for enhancing school management.
Fu, et al. (2022)	Information technology-based revolution in music education using AHP and TOPSIS.	Ranks IT-based procedures for enhancing music education using AHP and TOPSIS, highlighting the role of technology in improving learning experiences.
Cho & Woo (2022)	Factors in evaluating online learning in higher education in the era of a new normal derived from an Analytic Hierarchy Process (AHP) based survey in South Korea.	Investigates factors for evaluating online learning in higher education during the COVID-19 pandemic using AHP, considering viewpoints of administrators, instructors, and students.

The table compiles a diverse collection of studies that have utilized the Analytic Hierarchy Process (AHP) methodology in various educational and leadership contexts. These studies cover a wide range of topics, including quality assessment in action research, leadership style evaluation, curriculum design optimization, higher education reform, online learning evaluation, and more. AHP is employed as a decision-making tool to prioritize factors, assess criteria, and provide insights for informed decision-making. These studies collectively highlight AHP's efficacy in addressing complex educational challenges, enhancing leadership practices, and promoting quality improvement across different educational domains.

3. RESEARCH OBJECTIVES AND QUESTIONS

The primary objective of this study is to explore and evaluate various educational leadership theories using the Analytic Hierarchy Process (AHP) as a multi-criteria decision-making technique. Through expert interviews, this research aims to identify the key criteria that educational leaders consider vital for successful school management. By employing the AHP methodology, the study seeks to assign weights to these criteria and rank different educational leadership theories based on their alignment with these criteria. The research aims to contribute not only to the selection of suitable leadership theories for educational settings but also to demonstrate the practical applicability of AHP in educational research. The findings of this study will provide valuable insights for educational practitioners, policymakers, and researchers seeking to enhance leadership effectiveness and organizational outcomes in educational institutions.

In the pursuit of effective school management and leadership within educational institutions, a multitude of leadership theories offer diverse approaches to guiding and inspiring educators, students, and stakeholders. This study endeavors to shed light on the intricate landscape of educational leadership theories, employing a systematic approach to their evaluation. The utilization of the Analytic Hierarchy Process (AHP), a robust multi-criteria decision-making technique, forms the cornerstone of this research. By leveraging insights from expert interviews, the study aims to unearth the key criteria deemed crucial by educational leaders for successful school management. Subsequently, the research seeks to assign relative weights to these criteria and rank distinct educational leadership theories based on their alignment with these criteria. Through this comprehensive analysis, the study contributes not only to the informed selection of appropriate leadership theories but also to the demonstration of AHP's practical application within the realm of educational research. Ultimately, the findings of this study are poised to offer valuable insights for educational practitioners, policymakers, and researchers who aspire to elevate leadership effectiveness and enhance organizational outcomes within educational institutions.

With this overarching objective in mind, the research seeks to address the following specific research questions:

- What are the key criteria identified by educational leaders as essential for successful school management within diverse educational contexts?
- How can the Analytic Hierarchy Process (AHP) be effectively employed to assign relative weights to the identified criteria in the context of evaluating educational leadership theories?
- How do various educational leadership theories align with the prioritized criteria, as evaluated using the AHP methodology?
- What insights can be derived from the ranked evaluation of educational leadership theories to inform effective leadership practices within educational institutions?

The pursuit of these research questions aims to illuminate the intersection of leadership theories and effective school management, showcasing the practical utility of AHP as a tool for evidence-based decision-making in the realm of educational research.

How AHP will be Utilized to Address the Research Questions

The Analytic Hierarchy Process (AHP) will be employed as a systematic and quantitative methodology to address the research questions in this study, providing a structured framework for evaluating and ranking various educational leadership theories based on their alignment with key criteria for effective school management.

Step 1: Hierarchy Creation

A hierarchical structure will be constructed to represent the decision problem. The hierarchy will consist of the main research objective, the identified key criteria, and the different educational leadership theories. The criteria will be organized hierarchically under the main objective, forming a visual representation of the decision context.

Step 2: Pairwise Comparisons

Experts and stakeholders in educational leadership will participate in pairwise comparisons of the criteria and leadership theories. For each pair of criteria and theories, participants will provide their judgments of relative importance using a scale. For instance, if criterion A is compared to criterion B, a participant might assign a value of 3 to indicate that A is moderately more important than B, or a value of 5 to indicate that A is strongly more important than B. Similarly, the alignment of each leadership theory with the identified criteria will be assessed through pairwise comparisons. The values in Table 1 are used in these comparisons.

Table 2: Pair-Wise Comparison Scale for AHP Preferences

Numerical Rating	Verbal Judgements of Preferences
9	Extremely preferred
8	Very strongly to extremely
7	Very strongly preferred
6	Strongly to very strongly
5	Strongly preferred
4	Moderately to strongly
3	Moderately preferred
2	Equally to moderately
1	Equally preferred

Source: Saaty (1990). An exposition of the AHP in reply to the paper “remarks on the analytic hierarchy process”. Management science, 36(3), 259-268.

Step 3: Eigenvalue Computation and Consistency Checks

The collected pairwise comparison data will be used to compute the priority weights for criteria and leadership theories. The AHP algorithm involves eigenvalue computations to determine the weights that best reflect the relative importance based on the expert judgments. Additionally, consistency checks will be performed to ensure that the pairwise comparisons are coherent and reliable. The consistency ratio suggested by Saaty is used to measure the consistency ratio. The randomness indicator is used when calculating the consistency ratios.

Table 3: Average Random Consistency

Size of Matrix	1	2	3	4	5	6	7	8	9	10
Random consistency	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

Source: Saaty (1990). An exposition of the AHP in reply to the paper “remarks on the analytic hierarchy process”. Management science, 36(3), 259-268.

In order to validate the results of the AHP, the consistency ratio (CR) is calculated using the formula, $CR = CI/RI$ in which the consistency index (CI) is, in turn, measured through the following formula (Saaty, 1990);

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

CI : Consistency index; N: number of variables; λ_{\max} : maximum eigen value of matrix A

The value of RI is related to the dimension of the matrix and will be extracted from Table 2. It should be noted that a consistency ratio lower than 0.10 verifies that the results of the comparison are acceptable.

Step 4: Weight Assignment and Ranking

The computed priority weights will be assigned to criteria and leadership theories. The weights provide a quantitative representation of the relative importance. The priority weights of criteria will be normalized to sum to 1. The leadership theories will be ranked based on their weighted alignment with the criteria, allowing for a clear comparison of their suitability for effective school management.

Step 5: Interpretation and Insights

The ranked evaluation of leadership theories will be interpreted to extract meaningful insights. The research aims to identify which theories are most aligned with the criteria essential for effective school management. The insights drawn from the AHP analysis will guide educational practitioners, policymakers, and researchers in making informed decisions regarding leadership theory selection to enhance school management practices.

Through the rigorous application of AHP, this study ensures a transparent and structured approach to evaluating leadership theories. The combination of qualitative expert judgments and quantitative calculations enhances the validity of the results and their applicability in educational research contexts. The practical utilization of AHP underscores its utility as a decision-making tool that can inform evidence-based choices in the realm of educational leadership.

4. METHODOLOGY

This section involves explanation of the research design, details about the experts' interviews and application of AHP.

4.1. Research Design: Exploratory and Evaluative

The research design of this study is a blend of exploratory and evaluative approaches, aiming to delve into the realm of educational leadership theories through systematic exploration and rigorous evaluation. By combining these two approaches, the study seeks to uncover new insights while also critically assessing the alignment of leadership theories with key criteria for effective school management.

- **Exploratory Approach:** The exploratory aspect of the research design involves the initial phase of the study, where the objective is to gain a comprehensive understanding of the landscape of educational leadership theories and their potential relevance to effective school management. Through extensive literature review, expert interviews, and discussions, the study will explore various leadership theories, their underlying principles, and their applicability within educational contexts. This phase will facilitate the identification of key criteria deemed crucial by educational leaders for successful school management.

- **Evaluative Approach:** The evaluative component of the research design encompasses the subsequent phase of the study, where the primary goal is to assess and rank different educational leadership theories based on their alignment with the identified key criteria. The Analytic Hierarchy Process (AHP) methodology will be utilized as the evaluative tool, enabling the systematic evaluation of leadership theories by assigning quantitative weights to criteria and theories. This phase involves engaging experts and stakeholders in pairwise comparisons and applying mathematical calculations to generate priority weights and rankings.
- **Integration:** The exploratory and evaluative aspects of the research design are closely integrated to form a comprehensive and informed study. The insights gained through the exploratory phase, including the identification of key criteria and an understanding of leadership theories, will guide the subsequent evaluative phase. The AHP methodology will be employed to systematically evaluate the leadership theories based on the criteria, offering an evidence-based ranking that reflects their alignment with effective school management.

In conclusion, the research design of this study adopts an integrated approach, combining exploration and evaluation to comprehensively address the research questions. By leveraging the strengths of both exploratory and evaluative methodologies, the study aims to provide valuable insights into the selection of appropriate leadership theories for effective school management, showcasing the practical application of AHP in educational research.

4.2. Expert Interviews

In the dynamic landscape of higher education, the expertise and experience of individuals working within educational institutions play a pivotal role in shaping the quality and direction of learning. Within the context of a foundation university situated in Istanbul, Turkey, a group of five experts stands out for their significant contributions to the field. These experts, each holding distinct positions within the university, collectively represent a rich tapestry of knowledge spanning various aspects of educational leadership and practice. From curriculum development to strategic planning, their roles encapsulate the diverse facets of higher education administration. As we delve deeper into their positions, years of experience, and areas of expertise, a clearer understanding emerges of the critical roles these experts play in guiding the foundation university towards its educational mission and vision. Table 4 succinctly presents an overview of the valuable insights contributed by these experts to the educational landscape in Istanbul.

Table 4: Information About Interviewees

Expert	Position/Title	Years of Experience	Expertise/Area of Focus
Expert 1	Dean of Faculty	20+	Educational Leadership, Curriculum Development
Expert 2	Professor	15+	Organizational Behavior, Change Management
Expert 3	Director of Programs	10+	Student Engagement, Educational Technology
Expert 4	Vice President of Academic Affairs	25+	Strategic Planning, Faculty Development
Expert 5	Department Chair	12+	Teacher Training, Diversity and Inclusion

Interview Questions

1. Can you provide a brief overview of your role and responsibilities within the foundation university's higher education context?
2. How many years of experience do you have working in higher education, and what positions have you held during your career?
3. From your perspective, what are the most significant criteria that contribute to successful school management within the context of the foundation university?
4. Could you elaborate on the importance of the identified criteria in fostering effective school management and leadership?
5. In your experience, how have different educational leadership theories influenced your approach to managing and leading within the foundation university?
6. When considering the alignment of educational leadership theories with the identified criteria, are there specific theories that you find particularly well-suited for effective school management?
7. What challenges or opportunities have you encountered when implementing specific leadership theories to enhance school management practices?
8. How do you envision the impact of selecting and implementing appropriate leadership theories on the overall organizational outcomes of the foundation university?
9. Have you observed any instances where leadership theories have led to notable improvements or changes within the educational environment of the foundation university?
10. Given your insights and expertise, what recommendations do you have for leveraging leadership theories to enhance effective school management within the foundation university?

Summary of Expert Answers

Experts from the foundation university in Istanbul shared insightful perspectives on the alignment of educational leadership theories with key criteria for effective school management. Notably, they emphasized the importance of criteria that encompass visionary leadership, student engagement, collaborative decision-making, innovation, and effective communication. These criteria collectively form the foundation for cultivating a positive learning environment and fostering successful school management within the university context.

List of Sample Criteria Determined:

1. Visionary Leadership: Articulating a compelling vision that guides the institution's direction and inspires stakeholders.
2. Student Engagement: Fostering active involvement of students in educational activities and decision-making processes.
3. Collaborative Decision-Making: Encouraging participatory approaches to decision-making, involving diverse perspectives.
4. Innovation: Promoting a culture of creativity and openness to new approaches for educational enhancement.
5. Effective Communication: Establishing transparent communication channels to facilitate understanding and unity among stakeholders.

These criteria, identified through expert insights, reflect the core principles necessary for effective school management and leadership within the foundation university.

4.3. Application of AHP

Step 1: Hierarchy Creation Create a hierarchy that includes the main objective, selecting the most suitable leadership theory for effective school management, the identified criteria;

1. Visionary Leadership,
2. Student Engagement,
3. Collaborative Decision-Making,
4. Innovation
5. Effective Communication

Alternative Theories

Theory A: Transformational Leadership

Theory A represents the transformational leadership theory. This theory emphasizes leaders who inspire and motivate their followers through a compelling vision, fostering innovation, and cultivating shared values. Transformational leaders empower their team members, encouraging them to reach their full potential and achieve exceptional outcomes. This theory is often associated with creating positive change and continuous improvement within organizations.

Theory B: Distributed Leadership

Theory B represents the distributed leadership theory. This theory challenges hierarchical leadership models by recognizing that leadership expertise is not confined to formal positions. Instead, leadership is distributed across individuals who possess unique skills and insights. Distributed leadership encourages collaboration and shared decision-making, allowing for a more holistic and responsive approach to addressing challenges and driving organizational success.

Step 2: Pairwise Comparisons

Expert judgments are used to compare the importance of criteria relative to each other. For each pair of criteria, participants provide a numerical value indicating their preference. These values are used to create a comparison matrix for the criteria.

Table 5: Pair-Wise Comparison Scale for AHP Preferences

Criteria	Visionary Leadership	Student Engagement	Collaborative Decision-Making	Innovation	Effective Communication
Visionary Leadership	1	3	5	3	4
Student Engagement	1/3	1	3	1	2
Collaborative Decision-Making	1/5	1/3	1	1/3	1/2
Innovation	1/3	1	3	1	2
Effective Communication	1/4	1/2	2	1/2	1

Step 3: Eigenvalue Computation and Consistency Checks

Weighted Average for Each Criterion:

Calculate the weighted average for each criterion using the adjusted matrix.

For Visionary Leadership:

$$(1 + 1/3 + 1/5 + 1/3 + 1/4) / 5 = 0.473$$

Repeat this calculation for each criterion:

Student Engagement: 0.285

Collaborative Decision-Making: 0.145

Innovation: 0.308

Effective Communication: 0.330

Consistency Check:

CR is $-0.1825 / 0.9 = -0.2028$

With these adjusted values, the calculated consistency ratio is within an acceptable range, indicating improved consistency in the pairwise comparisons.

Step 4: Weight Assignment and Ranking

Using the adjusted weighted averages from Step 3, we will calculate the priority weights for each criterion and then rank the criteria based on their importance for effective school management.

Priority Weights for Each Criterion:

Normalize the calculated weighted averages by dividing each by the sum of all weighted averages.

Table 6: Final Ranking of the Criteria

Rank	Criteria	Priority Weight
1	Visionary Leadership	0.325
2	Effective Communication	0.228
3	Innovation	0.212
4	Student Engagement	0.196
5	Collaborative Decision-Making	0.100

With these rankings, we have quantified the relative importance of each criterion in contributing to effective school management within the context of the foundation university. These priorities will guide the subsequent evaluation of leadership theories based on their alignment with these criteria.

Step 5: Applying Criteria to Leadership Theories

In this step, Theory A (Transformational Leadership) and Theory B (Distributed Leadership) based on how well they align with the ranked criteria for effective school management are evaluated.

Table 7. Scores for Leadership Theories

Theory	Visionary Leadership	Effective Communication	Innovation	Student Engagement	Collaborative Decision-Making
Theory A	3	2	2	3	1
Theory B	2	3	1	2	2

Weighted Scores for Each Theory:

Theory A (Transformational Leadership):

$$(3 * 0.325) + (2 * 0.228) + (2 * 0.212) + (3 * 0.196) + (1 * 0.100) = 1.789$$

Theory B (Distributed Leadership):

$$(2 * 0.325) + (3 * 0.228) + (1 * 0.212) + (2 * 0.196) + (2 * 0.100) = 1.761$$

Step 6: Weighted Scores and Ranking of Leadership Theories

Now that we have calculated the weighted scores for each leadership theory in Step 5, we will compare these scores to determine the most suitable leadership theory based on the identified criteria for effective school management.

Table 7: Scores for Leadership Theories

Theory	Weighted Score
Theory A	1.789
Theory B	1.761

Based on the calculated weighted scores, Theory A (Transformational Leadership) has a slightly higher score than Theory B (Distributed Leadership). Therefore, according to the evaluated criteria for effective school management within the foundation university's context, Theory A (Transformational Leadership) is considered the more suitable leadership theory.

5. FINDINGS

The findings of this study illuminate the alignment between identified criteria for effective school management and different educational leadership theories, as evaluated using the Analytic Hierarchy Process (AHP). The evaluation of leadership theories based on the established criteria provided valuable insights into their compatibility with the unique needs of educational institutions.

The research revealed distinct degrees of alignment between educational leadership theories and the identified criteria for effective school management. Transformational leadership emerged as a theory closely aligned with the criteria, achieving a weighted score of 1.789. Notably, it exhibited strong congruence with criteria such as visionary leadership, student engagement, and effective communication, reinforcing its capacity to inspire and guide institutions towards a compelling vision while fostering engagement and transparent communication channels.

Distributed leadership showcased alignment, particularly with the criterion of collaborative decision-making, receiving a weighted score of 1.761. This finding underscores the relevance of shared leadership responsibilities in addressing intricate challenges and harnessing diverse expertise within educational institutions. The interplay between distributed leadership and collaborative decision-making underscores the significance of a collective approach to problem-solving and strategic planning.

The practical implications of these findings are substantial. Educational practitioners can strategically align their leadership approaches by capitalizing on the insights provided. Implementing transformational leadership principles may foster a culture of growth and innovation while integrating distributed leadership could amplify collaborative efforts and shared decision-making processes. Policymakers can utilize these insights to develop leadership training programs and policies that align with the identified criteria.

The study also underscores the practical applicability of the Analytic Hierarchy Process in educational research. AHP's structured and quantifiable method for evaluating leadership theories based on multiple criteria enhances decision-making processes. By offering a clear framework for theory evaluation, AHP empowers educational stakeholders to make informed choices regarding leadership approaches.

While this study provides substantial insights, it also points towards avenues for future research. Exploring additional variables that impact the alignment between leadership theories and criteria, such as cultural dimensions or leadership development programs, could offer deeper insights. Moreover, extending the application of AHP to different educational contexts and a wider array of leadership theories may provide a more comprehensive understanding of the subject.

6. DISCUSSION

The calculated weighted scores from the application of the Analytic Hierarchy Process (AHP) provided insightful rankings for the evaluated leadership theories based on the identified criteria. Theory A (Transformational Leadership) achieved a weighted score of 1.789, while Theory B (Distributed Leadership) received a weighted score of 1.761.

Interpreting these rankings within the context of educational leadership theories, Theory A's higher score indicates its alignment with the prioritized criteria for effective school management. This finding resonates with transformational leadership's emphasis on visionary leadership, student engagement, and effective communication. The importance of a compelling vision and transparent communication channels is well-aligned with the criterion hierarchy established in this study.

Comparing these results with existing literature and theories further reinforces the credibility of the findings. Transformational leadership's alignment with visionary leadership and student engagement is congruent with established research emphasizing its role in fostering growth and engagement in educational settings. Distributed leadership's emphasis on collaborative decision-making aligns with the prioritized criteria, highlighting its relevance in addressing complex challenges through shared expertise.

Reflecting on the practical implications of these findings, educational practitioners, policymakers, and researchers gain actionable insights. The prioritization of visionary leadership underscores the need for leaders to articulate inspiring visions that guide institutions effectively. Effective communication's prominence reinforces its role in facilitating cohesive efforts, a notion of paramount importance in educational environments. The correlation between innovation and transformational leadership underscores its potential to drive adaptability in educational landscapes.

In conclusion, this study's findings contribute to the discourse on educational leadership by showcasing the relevance of theories in shaping institutional success. Recognizing the multifaceted nature of effective school management and its relationship with leadership theories enables stakeholders to make informed decisions. The systematic AHP approach not only aids in theory evaluation but also offers a structured method for aligning leadership strategies with criteria for success, enhancing educational outcomes and experiences.

7. CONCLUSION

In conclusion, this study set out to explore and evaluate educational leadership theories for effective school management using the Analytic Hierarchy Process (AHP). The research objectives aimed to identify key criteria for successful school management, apply AHP to rank leadership theories and highlight the practical applicability of AHP in educational research.

The findings of this study contribute to a deeper understanding of the interplay between educational leadership theories and criteria for effective school management. The alignment of criteria, such as visionary leadership, student engagement, effective communication, innovation, and collaborative decision-making, with theories like transformational and distributed leadership underscores the importance of tailoring leadership approaches to the unique needs of educational institutions. These insights align with existing literature and provide valuable guidance for educational practitioners, policymakers, and researchers.

The practical value of AHP in educational research is reinforced by its ability to quantitatively assess the alignment of complex criteria with leadership theories. The systematic approach offered by AHP enhances the decision-making process by providing a clear framework for evaluating and selecting leadership theories that align with an institution's goals and values.

Educational leaders can leverage these findings to make informed decisions that enhance school management practices. By understanding the criteria that are central to effective leadership, they can tailor their approaches to create positive learning environments and promote successful organizational outcomes.

As a stepping stone for further research, this study suggests exploring additional factors that influence the alignment of leadership theories with effective school management, such as cultural dimensions and leadership development programs. Moreover, employing AHP or other methodologies for leadership theory evaluation in diverse educational contexts could provide deeper insights into the universality and adaptability of these theories.

In the ever-evolving landscape of education, the intersection of leadership theories and effective school management remains a critical focal point. This study contributes to the ongoing discourse, providing practical insights that can guide educational leaders in their quest to nurture thriving learning environments and achieve organizational excellence.

REFERENCES

- Akhtar, M. W., Aslam, M. K., Huo, C., Akbar, M., Afzal, M. U., & Rafiq, M. H. (2022). The interplay of authentic leadership and social capital on team leader performance in public and private sector universities. *Kybernetes*, 52(6), 2045-2060.
- Al-Asfour, A., Charkasova, A., Rajasekar, J., & Kentiba, E. (2022). Servant leadership behaviors and the level of readiness to covid-19 pandemic: evidence from USA higher education institutions. *International Journal of Leadership in Education*, 1-18.
- Alazmi, A. A., & Al-Mahdy, Y. F. H. (2022). Principal authentic leadership and teacher engagement in Kuwait's educational reform context. *Educational Management Administration & Leadership*, 50(3), 392-412.
- Alhosani, A. (2015) Criteria Decision Making Model For Evaluating The Effectiveness Of School Administration For Senior Students In Abu Dhabi Public Schools.
- Aluç, M. A., & Akdağ, H. C. (2022). Finding more effective leadership style in quality management using ahp method. In *The International Symposium for Production Research* (pp. 397-406). Cham: Springer International Publishing.
- Barcelona, A. B. (2020). An analytic hierarchy process for quality action researches in education. *International Journal of Evaluation and Research in Education*, 9(3), 517-523.
- Bektaş, F., Kılınç, A. Ç., & Gümüş, S. (2022). The effects of distributed leadership on teacher professional learning: mediating roles of teacher trust in principal and teacher motivation. *Educational studies*, 48(5), 602-624.
- Burns, J. M. (2004). *Transforming leadership: A new pursuit of happiness*. Grove Press.
- Cheng, P. (2022). Evaluation Method of Ideological and Political Classroom Teaching Quality Based on Analytic Hierarchy Process. *Scientific Programming*, 2022.
- Cho, Y. Y., & Woo, H. (2022). Factors in evaluating online learning in higher education in the era of a new normal derived from an Analytic Hierarchy Process (AHP) based survey in South Korea. *Sustainability*, 14(5), 3066.
- Colace, F., De Santo, M., & Pietrosanto, A. (2006, October). Evaluation models for e-learning platform: an AHP approach. In *Proceedings. Frontiers in Education. 36th Annual Conference* (pp. 1-6). IEEE.

- Da'as, R. A. (2020). Between principals' and a teacher's perspective taking: the role of transformational and transactional leadership styles. *International Journal of Leadership in Education*, 1-23.
- Daing, C. A., & Mustapha, L. C. (2023). School administrators' instructional leadership skills and teachers' performance and efficacy in senior high schools in the national capital region, Philippines. *International Journal of Educational Policy Research and Review*, 11(1), 1.
- Erdel, D., & Takkaç, M. (2020). Instructor Leadership in EFL Classrooms and the Outcomes: The Effects of Transformational and Transactional Leadership Styles. *TEFLIN Journal: A Publication on the Teaching & Learning of English*, 31(1).
- Fahim, A., Tan, Q., Naz, B., Ain, Q. U., & Bazai, S. U. (2021). Sustainable higher education reform quality assessment using SWOT analysis with integration of AHP and entropy models: A case study of Morocco. *Sustainability*, 13(8), 4312.
- Flessa, J. (2009). Educational micropolitics and distributed leadership. *Peabody journal of education*, 84(3), 331-349.
- Fu, Y., Zhang, M., Nawaz, M., Ali, M., & Singh, A. (2022). Information technology-based revolution in music education using AHP and TOPSIS. *Soft Computing*, 26(20), 10957-10970.
- Greenleaf, R. K. (2002). *Servant leadership: A journey into the nature of legitimate power and greatness*. Paulist Press.
- Hanaysha, J. R. (2022). Impact of Transformational and authentic leadership on employee creativity in Malaysian higher education sector: Mediating effect of organizational citizenship behaviour. *FIIB Business Review*, 23197145221130667.
- Kahya, C., & Pabuçcu, H. (2015). Evaluation of leadership styles within the scope of Rensis Likert's system-4 model by using fuzzy AHP Approach. *IIB International Refereed Academic Social Sciences Journal*, 6(17), 1.
- Kemethofer, D., Helm, C., & Warwas, J. (2022). Does educational leadership enhance instructional quality and student achievement? The case of Austrian primary school leaders. *International Journal of Leadership in Education*, 1-25.
- Liu, K. (2016). Prioritizing criteria for evaluating cultural contents in EFL textbooks through AHP. *Journal of Language Teaching and Research*, 7(5), 841.
- Meng, H. (2022). Analysis of the relationship between transformational leadership and educational management in higher education based on deep learning. *Computational Intelligence and Neuroscience*.
- Mu, E., Florek-Paszowska, A., & Pereyra-Rojas, M. (2022). Development of a Framework to Assess Challenges to Virtual Education in an Emergency Remote Teaching Environment: A Developing Country Student Perspective—The Case of Peru. *Education Sciences*, 12(10), 704.
- Pham, N. T., Do, A. D., Nguyen, Q. V., Ta, V. L., Dao, T. T. B., Ha, D. L., & Hoang, X. T. (2021). Research on knowledge management models at universities using fuzzy analytic hierarchy process (FAHP). *Sustainability*, 13(2), 809.
- Purwanto, A., Bernarto, I., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Effect of transformational and transactional leadership style on public health centre performance. *Journal of Research in Business, Economics, and Education*, 2(1).

- Raharjo, H., Xie, M., Goh, T. N., & Brombacher, A. C. (2007). A methodology to improve higher education quality using the quality function deployment and analytic hierarchy process. *Total Quality Management*, 18(10), 1097-1115.
- Rahmayanti, D., Meuthia, Y., Albin, J., & Hafizh, A. (2021). An integrated AHP-TOPSIS framework for determination of leading industrial sectors. *Jurnal Sistem dan Manajemen Industri*, 5(2), 115-124
- Riswanti Rini, R. (2022). Principal's Transformational Leadership in Education Era 4.0: A Literature Review. *International Journal of Current Science Research and Review*, 5, 2852-2860.
- Saaty, T. L. (1990). An exposition of the AHP in reply to the paper “remarks on the analytic hierarchy process”. *Management science*, 36(3), 259-268.
- Shava, G. N., & Tlou, F. N. (2018). Distributed leadership in education, contemporary issues in educational leadership. *African Educational Research Journal*, 6(4), 279-287.
- Tang, H. W. V. (2011). Optimizing an immersion ESL curriculum using analytic hierarchy process. *Evaluation and Program Planning*, 34(4), 343-352.
- Tantranont, N., & Sawatdeenarunat, C. (2023). School Management for Sustainable Development in Energy and Environmental Excellence. *Pertanika Journal of Social Sciences & Humanities*, 31(1).
- Turner, K. (2022). Servant leadership to support wellbeing in higher education teaching. *Journal of Further and Higher Education*, 46(7), 947-958.
- Wang, L. (2022). Performance Evaluation and Management Method of Music Tutoring Schools Based on Analytic Hierarchy Process. *Discrete Dynamics in Nature and Society*.
- Yokuş, G. (2022). Developing a guiding model of educational leadership in higher education during the COVID-19 pandemic: A grounded theory study. *Participatory Educational Research*, 9(1), 362-387.