Multiple Intelligences and Educational Leadership in the Society 5.0 era: An Analysis of Leadership Values in Context of Gardner's Theory

Muhammad Buya Al-Madany Abror[1], Fitriah M. Suud[2]

{muhammadbuya28@gmail.com[1], fitriahmsuud@gmail.com[2]}

Faculty of Islamic religion, Universitas Muhammadiyah Yogyakarta[1,2]

Abstract. The emergence of Society 5.0 presents both opportunities and challenges for educational leadership, requiring innovative approaches to address diverse individual abilities within educational institutions. This study investigates the intersection of educational leadership values and Gardner's Multiple Intelligences theory, emphasizing the integration of technology, socio-cultural dynamics, and leadership practices to nurture multiple intelligences. A qualitative methodology was employed through a systematic literature review of credible and recent sources, with primary data derived from Howard Gardner's *Multiple Intelligences* and secondary data from reputable databases such as Google Scholar, Springer, Scopus, and Web of Science. The findings reveal key leadership values essential for Society 5.0, including interpersonal intelligence fostering empathy, intrapersonal intelligence enhancing self-awareness, and spatial-musical intelligence driving creativity and innovation. These insights underline the potential of aligning leadership values with multiple intelligences to transform educational practices, enhance inclusivity, and foster adaptive leadership in a rapidly evolving technological context. Future research should incorporate empirical studies, interviews, or surveys to explore practical applications and further validate these theoretical findings.

Keywords: multiple intelligences, educational leadership, society 5.0, Gardner's Theory

1 Introduction

The Era of Society 5.0 is a gateway to change in the future, as seen by individuals integrating technology to create a progressive society capable of facing megatrends with innovative and collaborative solutions [1]. Within this paradigm, education emerges as a critical domain undergoing significant transformation, particularly in educational leadership [2][3]. As a core component of the education system, educational leadership profoundly influences the performance, quality, and adaptability of education across diverse settings [4]. In the dynamic context of Society 5.0, Indonesia faces unique challenges in educational leadership. Increasing heterogeneity and complexity in educational conditions require leaders to adapt to varied individual capabilities and educational needs [5].

However, schools in Indonesia often struggle to accommodate the diversity of students' learning styles due to limited resources and facilities. For example, research by Anisa Hidayati et al. highlights that insufficient infrastructure at SDN 162/II has hindered teachers from innovating

ACIE 2024, October 14-15, Jember, Indonesia

DOI 10.4108/eai.14-10-2024.2354531

in their teaching methods, leading to declining student literacy rates [6]. One promising approach to addressing these challenges is integrating Howard Gardner's theory of multiple intelligences. This theory asserts that individuals possess a spectrum of intelligences—linguistic, logical-mathematical, kinesthetic, musical, spatial, interpersonal, intrapersonal, and naturalistic—that influence their learning preferences and potential [7][8]. Educators can use this theory to create tailored learning environments that cater to diverse intelligences. Moreover, in the Society 5.0 framework, technology can mitigate resource limitations by enabling digital platforms and tools that support personalized and diverse learning experiences. For instance, gamified applications for kinesthetic learners, virtual simulations for spatial learners, or interactive music composition software for musical learners can optimize educational outcomes and foster teacher innovation [9] [10][11]. This technological integration allows schools to optimize resources, personalize learning experiences, and foster innovation among educators [12]

Despite the relevance of multiple intelligences to educational leadership, existing research often focuses narrowly on emotional and interpersonal intelligence, sidelining other intelligences such as spatial, kinesthetic, and musical dimensions. Studies by Coronado-Maldonado and Marquez (2023) and Gomez-Leal et al. (2021) emphasize emotional intelligence as foundational to effective leadership [13][14]. At the same time, Hoffman and Frost (2006) highlight the role of multiple intelligences in transformational leadership, particularly social and interpersonal intelligence [15]. However, these studies exhibit limitations, such as small sample sizes, specific settings, and a lack of holistic consideration of Gardner's full spectrum of intelligence. They also tend to rely on conceptual approaches without robust empirical validation, limiting their findings' generalizability and long-term applicability.

This study aims to address these gaps by adopting a more holistic approach. It explores the integration of all dimensions of multiple intelligences within educational leadership across diverse educational settings, emphasizing the role of technology and socio-cultural contexts. Specifically, this research seeks to (1) investigate the correlation between educational leadership values and Gardner's theory of multiple intelligences, (2) analyze how technological advancements in Society 5.0 can facilitate the application of multiple intelligences in educational leadership, (3) examine socio-cultural influences and their role in integrating multiple intelligences into leadership strategies, and (4) identify challenges and opportunities in applying multiple intelligences theory to educational leadership. Focusing on the Indonesian context—a nation characterized by cultural diversity and educational disparities—this study contributes to a deeper understanding of how educational leadership can effectively embrace heterogeneity, foster student potential, and drive innovation in a Society 5.0 framework. The findings aim to inform policymakers, educators, and leaders in crafting inclusive and future-ready educational strategies

2 Research Methods

This research uses qualitative research in the literature review model. Literature review research is a research method that collects, analyzes, and integrates books and previous research [16]. The integration of previous research aims to improve and strengthen the quality of further research topics and describe all relevant research in solving a problem [17][18] [19]. The sources

of this research are Howard Gardner's Multiple Intelligences book and research related to educational leadership and multiple intelligence.

2.1 Data Collection

In a thematic literature review, it is important to cover as much relevant scientific research as possible [16]. To obtain suitable articles, the authors searched online databases such as Google Scholar and Scopus, using relevant keywords, namely "Multiple Intelligences", "leadership values", and "innovation in the era of Society 5.0". The search was limited to articles published within the last 10 years (2014-2024). Articles that met the inclusion criteria were then analyzed descriptively. The inclusion and exclusion criteria were defined to ensure the selection of high-quality and relevant sources (Table 1).

Table 1. Article selection criteria

Criteria	Include	Exclude
Publishing Time	2014-2024	before 2014
Language	English	Other than English
Quality and source of articles or book	Google Scholar, springer, Scopus, Web of Science, Copernicus International	Other than Google Scholar, Springer, Scopus, Web of Science, and Copernicus International.
Theme focus	Multiple Intelligences, leadership values, and innovation in the Era of Society 5.0	Other than Multiple Intelligences, leadership values, and innovation in the Era of Society 5.0

The literature selection process was conducted in three stages to ensure the inclusion of high-quality and relevant studies. The first stage was Initial Screening, where articles were screened by title and abstract to identify studies focusing on multiple intelligences, leadership values, and innovation in the context of Society 5.0. Articles that did not meet these thematic criteria were excluded. In the second stage, Full Text Review, the selected articles were thoroughly examined to evaluate their alignment with the research questions and quality standards. This stage included verifying the use of reputable databases such as Google Scholar, Springer, Scopus, and Web of Science. The final stage, Final Selection, involved assessing the relevance and contribution of each article to the research topic. Only studies that met all inclusion criteria were retained for further analysis.

2.2 Analysis Data

This study uses a thematic analysis approach to identify and explore theories relevant to the research topic [17]. Key patterns across the literature were grouped and mapped using a

thematic matrix, which organized central themes based on relevance and similarity. The analysis began by categorizing themes such as publication year, research purpose, results, and discussions. This matrix helped organize the relationships between themes, offering a clearer understanding of the phenomenon and reducing bias. [18]. The next step involved synthesizing findings by comparing articles to identify recurring patterns in applying multiple intelligences to educational leadership. Finally, content analysis was performed to review the relevance of leadership values based on Gardner's theory and the challenges in its application, with results recorded using Microsoft Word and Excel. Table 2 below provides detailed information on the thematic analysis matrix applied in this study.

Table 2. Thematic analysis matrix

Fitur	Theme	Description
General	Year	Year of publication of the article and book
Content	Purpose	Research objectives
	Results	results and research discussion

A comparative analysis approach was adopted to ensure a comprehensive synthesis of findings. The first step involved Identifying Themes Across Literature, where recurring themes, such as the implementation of Gardner's multiple intelligences in leadership and their relevance to Society 5.0, were identified. Next, Contrasting Approaches highlighted variations in methodologies and contexts among studies to understand the differences in perspectives and findings. Finally, Synthesizing Insights provided a cohesive narrative on how Gardner's theory aligns with educational leadership values, identifying opportunities and challenges. The comparative analysis offered an integrated view of previous findings, emphasizing gaps, opportunities, and implications for future research. By categorizing data using the thematic matrix and conducting a thorough synthesis, this study presents a structured understanding of how multiple intelligences can inform leadership strategies in the Society 5.0 era.

3 Result and Discussion

According to the criteria described in the methods section, the secondary data collected resulted in - articles in international journals summarized in Table 3.

Table 3. Article findings of the analysis of educational leadership values in Gardner's theory in the Era of Society 5.0

No	Title	Authors	Multiple intelligences / Leadership value/innovation in the Era of Society 5.0	Research method
1	Perceptions of vocational school	Amat Jaedun, Muhammad	Interpersonal skill	Qualitative case study model

	students and teachers on the development of interpersonal skills towards Industry 5.0	Nurtanto, Farid Mutohhari, Ida Nugroho Saputro & Nur Kholifah		
2	A Typology of Multiple School Leadership	Yin-Cheong Cheng The	leadership model in era society 5.0	Qualitative Descriptive model
3	The relationship between school principals' social-emotional education leadership and teachers' organizational trust and job performance	Şenol Sezer a and Tevfik Uzun	interpersonal intelligence	Quantitative Survey model
4	The emotional intensity of educational leadership: a scoping review	Amanda Heffernan, Katrina MacDonald and Fiona Longmuir	Emotional skill	scoping review
5	Social Emotional Learning in Schools: The Importance of Educator Competence	Belinda G. Gimbert, Dustin Miller, Emily Herman, Meghan Breedlove, and Citlali Estela Molina	Interpersonal skill	Literature review
6	The School of the Future: The Role of Digital Technologies, Metacognitio n and Emotional Intelligence	Athanasios Drigas , George Papanastasio u and Charalabos Skianis	Interpersonal skill in Era Society 5.0	Literature review
7	The relationship	Raquel Gómez-Leal,	Interpersonal skill	systematic review

	between emotional intelligence and leadership in school leaders: a systematic review	Allison A. Holzer, Christina Bradley, Pablo Fernández-Berrocal & Janet Patti		
8	Emotional intelligence and school leaders: Evidence from Abu Dhabi	Rida Blaik Hourani , David Litz and Scott Parkman	Social skills and empathy	Qualitative case study model
9	Principals' Self- and Interpersonal Leadership Amid Work Intensification	Fei Wang	Interpersonal skill	Quantitative Survey model
10	Uncovering the role of principals in enhancing teacher professional learning in a centralized education system	Fatemeh Abbaspour ,Rezvan Hosseingholi zadeh and Mehmet Sukru Bellibas	interpersonal skill	Qualitative case study model
11	Being an Emotionally Intelligent Leader through the Nine-Layer Model of Emotional Intelligence—The Supporting Role of New Technologies	Athanasios Drigas , Chara Papoutsi and Charalabos Skianis	Emotional skill	Literature review
12	Critical Reflection: John Dewey's Relational View of Transformativ e Learning	Markus Holdo	Intrapersonal skill or Critical Reflection	Qualitative description model

13	The complexity of leadership competence in universities in the 21st century	Zahara Tussoleha Rony, Tyastuti Sri Lestari, Ismaniah, Mahmuddin Yasin and Fatimah Malini Lubis	Collaboration and reflection skill	Qualitative case study model
14	Self-leadership through self-reflection: guiding nursing faculty in taking ownership of their teaching practices in nursing education institutions	Vhothusa Edward Matahela and Gisela Hildegard van Rensburg	Reflection skill	Mix method
15	Education, collaboration and pedagogical phronesis: essential dimensions in professional learning and development	Bjørn Ribers, Gitte Miller Balslev and Christine Revsbech Jensen	Professionalism and reflection skill	meta-reflective
16	Emotional intelligence: A catalyst for inspirational leadership and management excellence	Parvesh K. Chopraa and Gopal K. Kanji	self-emotional skills	Quantitative Survey model
17	The Role of Leader Emotional Intelligence in Organizational Learning: A Literature Review Using 4I Framework	Navjot Kaur and Malar Hirudayaraj	Emotional skills, intrapersonal skills, and interpersonal skill	literature Review
18	Learning from intelligent failure: an	Pascale Benoliel and	Intrapersonal skill	Qualitative

	organizational resource for school improvement	Izhak Berkovich		
19	Improvising resilience: The unfolding of resilient leadership in COVID-19 times	Sara Lombardi, Miguel Pina e Cunha and Luca Giustiniano	self-emotional skills	Qualitative
20	Nurturing Leadership and Capacity Building for Success: Empowering Growth	Sayed Qudrat Hashimy, Amirhossein Jahromi , Muska Hamza, Iram Naaz, Nyamwero Bwire Nyamwero and Basavarajappa H.T.	Interpersonal skills, collaboration skills, and intrapersonal skill	Qualitative
21	The female chief communication officer: An exploration into her leadership traits	Breann Murphy	Reflection skill, communication skill	Qualitative
22	Communication quality and relational self-expansion: The path to leadership coaching effectiveness	Angela M. Passarell, Mai P. Trinh, Ellen B. Van Oosten and Amanda Varley	Communication skill	experimental design
23	The use of reflective pedagogies in sustainability leadership education-a case study	James Ayers , Jayne Bryant and Merlina Missimer	Reflection skill	Qualitative case study model
24	Exploring the influence of leader emotional intelligence	Anteneh T. Asmamaw1and Tesfaye Semela	Reflection skills and empathy	A qualitative descriptional

	on faculty engagement in Ethiopian higher education			
25	The perspective of Leadership 4.0 in the Era of the fourth industrial revolution: A Comprehensive view	Abid Haleema, Mohd Javaida, Ravi Pratap Singh	Reflection skill, innovative and visionary	Qualitative
26	The role of a leader in stimulating innovation in an organization	Katarzyna Kozioł-Nadolna	Innovative, visionary, and creativity	Quantitative
27	The Creative Space Theory is a map to explore the mind	Jean-Christophe Goulet-Pelletier and Denis Cousineau	creativity	Qualitative
28	Spatial abilities associated with open math problem-solving	Li Wang, Chen Cao Xinlin Zhou, and Chunxia Qi	Problem-solving skill	Quantitative
29	Investigating the role of spatial thinking in children's design ideation through an open-ended design-by-analogy challenge	Caiwei Zhu · Remke Klapwijk· Miroslava Silva-Ordaz· Jeroen Spandaw· Marc J. de Vries	Spatial skill	Design-based research
30	Investigating Arts Education Effects on School Engagement and Climate	Daniel H. Bowen and Brian Kisida	Visionary and motivation	Quantitative

31	Does Musically Responsive School Curriculum Enhance Reasoning Abilities and Helps in Cognitive Development of School Students?	Ashraf alam and Atasi Mohanty	Motivation and creativity	Qualitative
32	Transforming Gifted Education in Schools: Practical Applications of a Comprehensi ve Framework for Developing Academic Talent	Rena F. Subotnik, Paula Olszewski-Kubilius, Susan Corwith, Eric Calvert, and Frank C. Worrell	Motivation	Qualitative
33	Engaging Students Using an Arts-Based Pedagogy: Teaching and Learning Sociological Theory through Film, Art, and Music	Linda Hunter and Eleanor Frawley	Creativity and motivation	Mix-method
34	Creativity-Fostering Teacher Behaviors in Higher Education: A Transdisciplin ary Systematic Literature Review	Rene Brauer, Jarrod Ormiston, and Simon Beausaert	Creativity	Systematic Literature Review
35	Beyond disciplinary engagement:	Lina Markauskait e, Baruch	Visionary	Qualitative

	Researching the ecologies of interdisciplinary learning	Schwarz, Crina Damșa and Hanni Muukkonen		
36	Considering leadership pedagogy in creative arts education	Daniel Walzer	Creativity	Qualitative
37	The effects of multiple intelligence-based reading tasks on EFL students' reading skills achievements: The case of university students in Ethiopia	Teshale Alemu Gebremeskel , Mebratu Mulatu Bachore , Elias Woemego Bushisho	The curriculum must be designed to support the development of multiple intelligences	Qualitative case study model
38	Artificial Intelligence Technology Drives Intelligent Transformation of Music Education	Chunbo Hou	application Technology as a supporter *of musical intelligence*	Quantitative
39	The Effect of Creating 3D Objects with Block Codes on Spatial and Computational Thinking Skills	Mehmet KÜÇÜK, Tarık TALAN , Muhammet DEMIRBILEK	Creating 3D Objects with Block Codes as supporter *Spatial Intelligences*	Quantitative experimental design and pre-test post-control group
40	A Sustainable Collaborative Talent Management Through Collaborative Intelligence Mindset Theory: A Systematic Review	Yew Chee Chew and Siti Rohaida Mohamed Zainal	Collaborative intelligence in sustainable	systematic reviews
41	Nurturing a Climate of Innovation in a Didactic	Alpay Ersozlua, Mehmet Karakus,	Innovation	Qualitative case study model

	Educational System: A Case Study Exploring Leadership in Private Schools in Turkey	Fahri Karakasc, and Deanne Lynn Clouder		
42	Teaching inside a digital classroom: A quantitative analysis of attitude, technological competence and access among teachers across subject disciplines	Ericson Alieto, Bernadeth Abequibel-Encarnacion, Edison Estigoy, Keir Balasa, Abee Eijansantos and Angel Torres-Toukoumidis	digital-based learning	Qualitative
43	The Theoretical Review and Practice of Multiple Intelligences in English Language Teaching	Mongkolchai Tiansoodeen ona and Pragasit Sitthitikulb	Educators must have skills in using Multiple Intelligences-based learning methods	Theoretical Review
44	Correlations Between Learning Style Preferences and Arab-Speaking Gulf Region First-Year College Students' EFL Performance: A Literature Review	Raafat Gabriel	Integrating multiple intelligences into the curriculum is challenging because traditional education systems tend to focus on logic-mathematics and linguistics.	Literature Review
45	Exploring Artificial Intelligence in Academic Essay: Higher Education	Agung Rinaldy Malik , Yuni Pratiwi , Kusubakti Andajani , I Wayan	application Intelligence in Academics Essay	Quantitative

	Student's Perspective	Numertayas, Sri Suharti , Arisa Darwis , Marzuki		
46	Enhancing student creativity through an interdisciplinary, project-oriented, problem-based learning undergraduate curriculum	Te-Sheng Chang , Hung-Che Wang , Alexander MacDonald Haynes , Mei-Mei Song , Shih-Yao Lai , Shang-Hsien Hsieh	interdisciplinary problem-based learning boosts student creativity.	Qualitative
47	Artificial Intelligence Bringing Improvements to Adaptive Learning in Education: A Case Study	Claudio Giovanni Demartini , Luciano Sciascia , Andrea Bosso and Federico Manuri	Application of Artificial Intelligence to Enhance Adaptive Learning in Education	Qualitative case study model
48	Effects of the SPARK Teen Mentoring Program for High School Students	Amy L. Green, Stephen Ferrante, Timothy L. Boaz, Krista Kutash, Brooke Wheeldon-Reece.	The Impact of Mentoring Programs on Adolescents' Emotional and Interpersonal Development	Quantitative

Based on the review and analysis results, several themes were obtained that illustrate the relevance of leadership values to Gardner's theory and the opportunities and challenges of applying Multiple Intelligence theory in educational leadership in the Society 5.0 era. The findings in this study highlighted various positive aspects, such as increased motivation, engagement, effectiveness, and satisfaction in the leadership process based on the multiple intelligence approach. They also found leadership values that align with Gardner's theory, including interpersonal intelligence and empathy, intrapersonal intelligence and reflection, and spatial and musical intelligence with creativity and innovation. In addition to the positive impacts, there are several challenges, such as difficulty integrating this theory into the traditional education system, limited resources, and the need for more intensive training for educational leaders.

3.1 Relevance of educational leadership values to Gardner's theory

The Era of Society 5.0 emphasizes implementing technology in everyday life and creates an inclusive and adaptive leadership approach [19]. The dynamism of social life and the educational environment requires leaders of educational institutions to understand the plurality of forms of intelligence, as proposed by Howard Gardner in the theory of Multiple Intelligences. Leaders of educational institutions in the current Era not only focus on intellectual intelligence but must also focus on the differentiation of other forms of intelligence, intelligence that can support educational innovation [20].

The theory of multiple intelligences creates a new approach to understanding the concept of leadership. In the realm of education, effective leadership is not only based on administrative and management skills but also on skills in developing multiple intelligence abilities in the educational institution itself and school members [21]. By optimizing the plurality of abilities, school members can combine plurality in solving problems and carrying out different jobs effectively [22].

In the Era of Society 5.0, the theory of Multiple Intelligences is becoming increasingly relevant because developing technology is able to develop a plurality of intelligences with more interactive and personalized methods. That expands the idea that a person's intelligence is not only limited to academic abilities or skills but includes the differentiation of abilities needed to solve problems in everyday life [23]. The Era of Society 5.0 also demands that leaders of educational institutions be able to implement technology in the learning process [24], especially in the diversity of intelligence. Educational Institution leaders must be able to create an individualized and flexible learning environment where technology is applied to support the development of pluralistic intelligence. Leadership in this Era must emphasize innovative, collaborative, creative, and adaptive aspects, adjusting to the demands of an ever-dynamic era [25]. Howard Gardner identifies multiple intelligences and emphasizes the importance of developing leadership skills in accordance with multiple intelligences. In the context of the Era of Society 5.0, leadership values that exist in the theory of Multiple Intelligences include:

3.1.1 Interpersonal Intelligence and Empathy

Interpersonal intelligence, one of the types of intelligence in Howard Gardner's Theory of Multiple Intelligences, is the ability to understand and interact with others effectively [26]. According to Rida Blaik Hourani, David Litz, and Scott Parkman, in the context of educational leadership, this intelligence is essential because a leader of an educational institution not only plays a role in managing the school but also in providing guidance, motivation, and support to teachers, students and school staff [27]. Fei Wang stated that empathy is a core element of interpersonal intelligence. A leader with high interpersonal intelligence tends to be able to put himself in the shoes of others, understanding their emotional needs, challenges, and aspirations [28]. Fatemeh Abbaspour, Rezvan Hosseingholizadeh, and Mehmet Sukru Bellibas stated Educational institution leaders must have skills in understanding, socialization skills with others, skills in appreciating a plurality of views, and skills in building optimal relationships with learners and staff [29]. Amat Jaedun et al. and Yin-Cheong Cheng stated that these skills are important in creating an inclusive and positive learning environment [30][31]. With the ability to understand others' feelings and perspectives, leaders can build strong relationships with teachers, learners, and parents [32]. Şenol Sezer and Tevfik Uzun stated that empathy allows leaders to understand the emotional needs of their members, which can result in more harmonious and productive working relationships [33].

Amanda Heffernan, Katrina MacDonald, and Fiona Longmuir stated that leaders with interpersonal intelligence and empathy can recognize when someone needs encouragement or emotional help. They can provide constructive feedback, encouraging teachers and learners to develop without feeling pressured or unappreciated [34]. With the ability to empathize, educational leaders will pay more attention to the impact of their decisions on the whole school community. Belinda G. Gimbert, Dustin Miller, Emily Herman, Meghan Breedlove, and Citlali Estela Molina stated that they would consider the needs, feelings, and well-being of others in the decision-making process, resulting in more appropriate policies [35].
Athanasios Drigas, George Papanastasiou, and Charalabos Skianis stated, In the Era of Society 5.0, where technology and humanism are intertwined, interpersonal intelligence and empathy are becoming increasingly relevant. Leaders of educational institutions who are interpersonally good can be a good link between humans and technology. They can manage change by paying attention to the emotional impact felt by the school community [36]. Raquel Gómez-Leal, Allison A. Holzer, Christina Bradley, Pablo Fernández- and Janet Patti stated that The relevance of interpersonal intelligence with empathy in educational leadership emphasizes the importance of a deep understanding of people in managing educational institutions, creating supportive environments, and facilitating academic success and emotional well-being[37].

3.1.2 Intrapersonal Intelligence and Reflection

According to Howard Gardner in his Theory of Multiple Intelligences, intrapersonal intelligence is a person's ability to understand oneself, including emotions, motivations, strengths, and weaknesses, and how they influence actions and decisions [7]. Athanasios Drigas, Chara Papoutsi, and Charalabos Skianis stated, drigasIn the context of educational leadership, intrapersonal intelligence is very important because it helps leaders recognize and manage themselves so they can lead more effectively and reflectively [38]. Markus Holdo stated that reflection is the process by which one examines experiences, actions, and decisions that have been made to gain more profound and sustainable learning [39]. Research from Zahara Tussoleha Rony et al., Vhothusa Edward Matahela and Gisela Hildegard van Rensburg, and Bjørn Ribers, Gitte Miller Balslev, and Christine Revsbech Jensen stated that educational institution leaders must be consistent in introspecting policies and practices that have been carried out, identifying and evaluating things that need to be improved and continuously developing themselves and professionalism, because there is a strong relationship between leadership and professionalism [40] [41][42]. It helps leaders of educational institutions always be relevant when facing problems.

Research from Parvesh K. Chopraa and Gopal K. Kanji, Navjot Kaur, and Malar Hirudayaraj stated that leaders of educational institutions with high intrapersonal intelligence have more awareness of their feelings, strengths, weaknesses, and biases [43][44]. Pascale Benoliel and Izhak Berkovich stated that this awareness allows them to be more honest about their actions and decisions, identifying what went well and where improvements are needed. Self-reflective leaders will have a more realistic view of how they positively and negatively contribute to the educational institution's dynamics [45]. Sara Lombardi, Miguel Pina e Cunha, and Luca Giustiniano stated that reflective educational institution leaders with intrapersonal intelligence can bounce back from failures or challenges more strongly. They can evaluate their weaknesses or mistakes without criticizing themselves too harshly, but rather, they see them as learning opportunities [46].

Research from Sayed Qudrat Hashimy, Amirhossein Jahromi, Muska Hamza, Iram Naaz, Nyamwero Bwire Nyamwero, and Basavarajappa H.T. stated that this allows them to be more resilient in the face of difficult situations and continue to inspire others despite obstacles [47]. Breann Murphy stated that educational institution leaders with intrapersonal intelligence and often reflect are wiser in communication. They understand how their emotions and thoughts affect the way they interact with others [48]. Research from Angela M. Passarell, Mai P. Trinh, Ellen B. Van Oosten, and Amanda Varley stated reflection allows leaders of educational institutions to adapt their communication to the situation at hand, thus motivating and influencing members more effectively [49]. James Ayers, Jayne Bryant, and Merlina Missimer stated that leaders who consistently engage in the self-reflection model suit teachers and students regarding self-development and professional growth. By practicing reflection, leaders foster a school environment where individuals are encouraged to learn, improve, and grow [50].

Overall, research from Anteneh T. Asmamaw1 and Tesfaye Semela stated intrapersonal intelligence and reflection are interrelated in educational leadership. Leaders who possess these abilities can better recognize their weaknesses and strengths, understand the motivations behind their decisions, and continuously develop to become more effective leaders [51]. Abid Haleema, Mohd Javaida, And Ravi Pratap Singh stated that the relevance of intrapersonal intelligence with reflection creates leaders who are more authentic, mindful, and able to make more meaningful and impactful decisions for educational institutions in this society 5.0 era [52].

3.1.3 Spatial-Musical Intelligence and Innovative-Creativity.

Spatial and musical intelligence, two types in Howard Gardner's Theory of Multiple Intelligences, have significant relevance in fostering creativity and innovation, including educational leadership. Although often associated with the arts, these two intelligences can be important resources for educational leaders in creating creative and innovative learning environments. In the face of the comprehensive Society 5.0 era, Katarzyna Kozioł-Nadolna stated that leaders of educational institutions must encourage creativity and innovation, both in the way of thinking and in the solutions offered [53]. That involves supporting a learning process that focuses not only on the perspective of numbers and texts but also on the perspective of creative expressions such as art and music. Research from Jean-Christophe Goulet-Pelletier and Denis Cousineau stated that Spatial intelligence is the ability to think in images, understand spatial patterns, and visualize ideas concretely [54]. Li Wang, Chen Cao Xinlin Zhou, and Chunxia Qi stated, Spatial intelligence enables educational leaders to solve problems from a different perspective by seeing patterns and visual solutions that are not always obvious [55]. Caiwei Zhu · Remke Klapwijk· Miroslava Silva-Ordaz· Jeroen Spandaw, · Marc J. de Vries stated that Spatial intelligence enables educational leaders to generate innovative ideas in solving educational challenges [56].

Musical intelligence relates to the ability to recognize, create, understand, and express patterns of rhythm and tone [26]. Although this intelligence seems more relevant in the arts and musical fields, it can enhance creativity and innovation in educational leadership. Leaders of educational institutions with musical intelligence implement art, music, or sound-based learning to support student creativity. Daniel H. Bowen and Brian Kisida stated that encouraging the integration of musical arts in the curriculum is a way to increase learner engagement, even in non-musical subjects such as science or math [57]. Ashraf Alam and Atasi Mohanty stated that musically sensitive leaders better understand the importance of sound and ambiance in creating an environment that supports creativity. For example, they can use music to create a conducive

atmosphere during learning or reduce stress, both for learners and for increasing creativity and productivity [58]. Research from Rena F. Subotnik, Paula Olszewski-Kubilius, Susan Corwith, Eric Calvert, and Frank C. Worrell stated that Musically intelligent leaders emphasize the importance of extracurricular programs that focus on music and the arts by facilitating activities that enrich learners' experiences, such as school bands, choirs, or other musical arts programs, which can stimulate learners' creativity well [59].

Linda Hunter and Eleanor Frawley stated that combining spatial and musical intelligence in educational leadership enables leaders to encourage creative and innovative interdisciplinary approaches. They may be more open to combining different disciplines with artistic and visual elements, thus creating more engaging and dynamic learning methods [60]. Research from Rene Brauer, Jarrod Ormiston, and Simon Beausaert stated that educational leaders are catalysts in building a school culture that supports creativity and innovation [61]. Lina Markauskaite, Baruch Schwarz, Crina Damșa, and Hanni Muukkonen stated that This is done by exploring new ideas, experimenting with learning methods, and supporting cross-disciplinary collaboration between teachers and learners [62]. With a deep understanding of spatial and musical intelligence, Daniel Walzer stated that leaders can encourage various forms of creativity in schools, from visual arts to music, drama, and technology [63]. This encouragement of creativity broadens learners' horizons and encourages them to think beyond traditional academic boundaries. Thus creating an environment that supports learners, teachers, and staff in developing to their full potential in the society 5.0 era that increasingly demands creative and innovative thinking.

3.2 Strategies for applying Multiple Intelligence in adaptive educational leadership in Society 5.0.

There are several strategies for integrating the concept of multiple intelligences in education leadership in the Era of Society 5.0. First, Multiple Intelligences-based Curriculum Integration. Research from Teshale Alemu Gebremeskel et al. and Te Seng-Chang et al. stated The curriculum must be designed to support the development of multiple intelligences through various practices that can increase students' critical thinking skills [64][65]. Recent empirical evidence from a study by Teshale Alemu Gebremeskel et al. Ethiopia shows that multiple intelligence-based reading tasks significantly improved students' reading achievements, particularly in details, vocabulary, and inference, outperforming conventional methods and benefiting struggling readers [64]. Second, application technology supports *multiple intelligences*. Research from Chunbo Hou, Agung Rinaldy Malik, et al., and Mehmet et al. stated technology such as Artificial Intelligence, e-learning platforms, and gamification could be applied to support the development of students' Multiple Intelligences. For example, interactive music applications can be used to develop musical intelligence, and 3D simulations can be used to develop spatial intelligence [66][67][68]. In Italy, empirical evidence from Claudio Giovanni Demartin et al. shows that data mining through tools such as Excel, PowerBI, and RapidMiner effectively supports the teaching and learning process. Based on the ISO 15288 standard, student competencies are evaluated through projects, code reverse-engineering, and hardware development [69]. Third, developing a collaborative learning environment. Research from Yew Chee Chew, Siti Rohaida Mohamed Zainal, and Alpay Ersozlua et al. stated Educational institution leaders must be able to create an ecosystem in which there is a collaboration between educators and students as a supporter of interpersonal and intrapersonal intelligence [70] [71]. The case study conducted by Amy L. Green et al. in the Southeast region of the United States

provides preliminary evidence of the effectiveness of mentorship programs in supporting the development of emotional and interpersonal capacities in high school-aged adolescents, which contribute significantly to prosocial behavior and academic achievement [72].

3.3 The challenge of applying Multiple Intelligence in adaptive educational leadership in Society 5.0

Although the Society 5.0 era brings many opportunities for innovation in education, especially Multiple Intelligences, it also brings challenges. First, unequal access to technology. Ericson Alieto, Bernadeth Abequibel-Encarnacion, Edison Estigoy, Keir Balasa, Abee Eijansantos, and Angel Torres-Toukoumidis mentioned in their research. Not all educational institutions and even students have equal access to sophisticated technology , which creates an imbalance in developing multiple intelligences [73]. Second, Educator Readiness. Mongkolchai Tiansoodeenona and Pragasit Sitthitikulb mentioned not many educators have the skills needed to use teaching methods based on Multiple Intelligences, many educators only use teaching and evaluation methods with a logical-mathematical approach that only benefits students who have logical-mathematical intelligence [74]. Therefore, educators should need more training related to Multiple Intelligences so that the differentiation of students' intelligence has a place and students' understanding increases[75][76]. Third, adjusting the traditional curriculum. Raafat Gabriel stated in his research that integrating multiple intelligences into the curriculum can be challenging, especially in the traditional education system that still emphasizes logical-mathematical and linguistic intelligence [77].

4 Conclusion

Educational leadership in the Society 5.0 era must be based on a deep understanding of Multiple Intelligences. Educational leaders must be able to facilitate educational change that is inclusive and adaptive to technological developments. By integrating leadership values that support the development of multiple intelligences, leaders of educational institutions can create a responsive, comprehensive, and sustainable learning ecosystem to address the opportunities and challenges of the Society 5.0 era. This research aims to provide new insights into how Howard Gardner's Multiple Intelligences concept can be implemented in modern educational leadership and how leaders can apply technology to support the development of Multiple Intelligences to foster an innovative educational ecosystem.

Based on the findings of this research, educational leaders can take several concrete steps. First, using diverse instructional methods, they should integrate Multiple Intelligences-based approaches into the curriculum to address various learning styles, such as linguistic, logical-mathematical, and spatial intelligence. Second, educational leaders can harness technology by adopting digital tools like Artificial Intelligence (AI), e-learning platforms, and gamification to support the development of different intelligences, such as using AI to personalize learning or gamification to enhance engagement for kinesthetic learners. Third, providing professional development opportunities for teachers is essential, focusing on applying Multiple Intelligences in the classroom. Workshops and training on identifying and nurturing various intelligences will help teachers better support their students. Additionally, fostering collaboration through group

projects or peer learning activities can promote interpersonal intelligence and strengthen community ties. Lastly, educational leaders should prioritize inclusive leadership to ensure all students have access to the necessary resources and support to develop their unique intelligence.

However, this research has some limitations. It relies primarily on theoretical analysis and secondary data sources, which may not fully capture the practical challenges faced by educational leaders in diverse contexts. Moreover, the study did not incorporate empirical data from real-world case studies or feedback from educational leaders, which could offer deeper insights into the actual application of these concepts. Future research could address these limitations by including field research, interviews, or surveys to explore how Multiple Intelligences are applied in educational leadership across different institutions and cultural settings, providing a more nuanced understanding of their practical implementation.

References

[1] G. P. Laura Icela, R. M. María Soledad, and E. G. Juan Antonio, "Education 4.0 Maturity Models for Society 5.0: Systematic literature review," *Cogent Bus. Manag.*, vol. 10, no. 3, pp. 0–27, 2023, doi: 10.1080/23311975.2023.2256095.

[2] E. Asyiah, E. Muslihah, and Shobri, "The Relevance Of Kh Ahmad Dahlan's Education Model In The Era Of Society 5.0," *KAFFAH J. Pendidik. dan Sosio Keagamaan*, vol. 2, no. 1, pp. 11–26, 2023, [Online]. Available: http://jurnal.unmabanten.ac.id/index.php/kaffah/article/view/795.

[3] M. C. Tavares, G. Azevedo, R. P. Marques, and M. A. Bastos, "Challenges of education in the accounting profession in the Era 5.0: A systematic review," *Cogent Bus. Manag.*, vol. 10, no. 2, pp. 0–30, 2023, doi: 10.1080/23311975.2023.2220198.

[4] A. Luthfi, M. Giatman, and E. Ernawati, "Analisis Bibliometrik: Perkembangan Penelitian Manajemen dan Kepemimpinan Sekolah," *JTEV (Jurnal Tek. Elektro dan Vokasional)*, vol. 10, no. 1, pp. 48–60, 2024, doi: https://doi.org/10.24036/jtev.v10i1.128371.

[5] T. Triwiyanto, "Manajemen Pendidikan & Kepemimpinan Pendidikan," in *Seminar Nasional Departemen Administrasi Pendidikan Tahun 2024*, 2024, no. 5, pp. 209–221, [Online]. Available: https://doi.org/10.17977/um083.8662.

[6] A. Hidayati *et al.*, "Analisis Faktor Penyebab Rendahnya Kemampuan Literasi Siswa Sekolah Dasar," *J. Inovasi, Eval. dan Pengemb. Pembelajaran*, vol. 4, no. 1, pp. 75–80, 2024, doi: 10.54371/jiepp.v4i1.381.

[7] H. Gardner and T. Hatch, "Educational Implications of the Theory of Multiple Intelligences," *Educ. Res.*, vol. 18, no. 8, pp. 4–10, 1989, doi: 10.3102/0013189X018008004.

[8] S. Syarifah, "Konsep Kecerdasan Majemuk Howard Gardner," *Sustain. J. Kaji. Mutu Pendidik.*, vol. 2, no. 2, pp. 176–197, 2019, doi: 10.32923/kjmp.v2i2.987.

[9] M. C. Tavares, G. Azevedo, and R. P. Marques, "The Challenges and

Opportunities of Era 5.0 for a More Humanistic and Sustainable Society—A Literature Review," *Societies*, vol. 12, no. 6, p. 149, 2023, doi: https://doi.org/10.3390/soc12060149.

[10] R. D. Costa, G. F. Souza, R. A. M. Valentim, and T. B. Castro, "The theory of learning styles applied to distance learning," *Cogn. Syst. Res.*, vol. 64, pp. 134–145, 2020, doi: 10.1016/j.cogsys.2020.08.004.

[11] M. Pascu, "The contribution of students' learning styles to competences development through the use of Kahoot learning platform," *Cogent Educ.*, vol. 11, no. 1, p., 2024, doi: 10.1080/2331186X.2024.2352320.

[12] A. Alam and A. Mohanty, "Educational technology: Exploring the convergence of technology and pedagogy through mobility, interactivity, AI, and learning tools," *Cogent Eng.*, vol. 10, no. 2, 2023, doi: 10.1080/23311916.2023.2283282.

[13] I. Coronado-Maldonado and M. D. Benítez-Márquez, "Emotional intelligence, leadership, and work teams: A hybrid literature review," *Heliyon*, vol. 9, no. 10, 2023, doi: 10.1016/j.heliyon.2023.e20356.

[14] R. Gómez-leal *et al.*, "The relationship between emotional intelligence and leadership in school leaders : a systematic review ABSTRACT," *Cambridge J. Educ.*, vol. 00, no. 00, pp. 1–21, 2021, doi: 10.1080/0305764X.2021.1927987.

[15] B. J. Hoffman and B. C. Frost, "Multiple intelligences of transformational leaders : an empirical examination," *Int. J. Manpow.*, vol. 27, no. 1, pp. 37–51, 2006, doi: 10.1108/01437720610652826.

[16] F. Liñán and A. Fayolle, "A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda," *Int. Entrep. Manag. J.*, vol. 11, no. 4, pp. 907–933, 2015, doi: 10.1007/s11365-015-0356-5.

[17] M. Vaismoradi, H. Turunen, and T. Bondas, "Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study," *Nurs. Heal. Sci.*, vol. 15, no. 3, pp. 398–405, 2013, doi: 10.1111/nhs.12048.

[18] M. E. Kiger and L. Varpio, "Thematic analysis of qualitative data: AMEE Guide No. 131," *Med. Teach.*, vol. 42, no. 8, pp. 846–854, 2020, doi: 10.1080/0142159X.2020.1755030.

[19] M. T. Sutrisno, "Deep Vocational Education Strategy Facing The Era Of Society 5.0," in *The 1st International Innovation Technology Proceedings*, 2023, vol. 1, no. 1, pp. 48–59, [Online]. Available: https://iite-proceeding.poltekindonusa.ac.id/.

[20] S. Nisrofah, "Konsep Penilaian Portofolio Berbasis Multiple Intelligence Dalam Pembelajaran Pai," *Rabbani J. Pendidik. Agama Islam*, vol. 5, no. 1, pp. 69–87, 2024, doi: 10.19105/rjpai.v5i1.11861.

[21] K. M. Heikkinen, R. Ahtiainen, E. Fonsén, and A. Kallioniemi, "Leadership as a profession in early childhood education and care," *Educ. Res.*, vol. 00, no. 00, pp. 1–17, 2024, doi: 10.1080/00131881.2024.2371352.

[22] S. D. Wilson and B. Mujtaba, "The Relationship between Leadership and Multiple Intelligences with the 21st Century ' 's Higher Education Faculty," *J. Appl. Bus. Econ.*, vol. 11, no. 3, pp. 106–121, 2010.

[23] M. Husnaini, D. A. Y. Al-Hidabi, B. Kartika, I. Victorynie, and A. S. Mukhtasor, "Quranic Multiple Intelligences and its Implementation in Educational Institutions," *Int. J. Asian Educ.*, vol. 2, no. 3, pp. 439–454, 2021, doi: 10.46966/ijae.v2i3.232.

[24] G. Arynova, G. Uaisova, A. Zhumadullayeva, S. Kalbergenova, and M. Bekbaeva, "The impact of technology and pedagogical support on the development of social intelligence in adolescents," *J. Educ. e-Learning Res.*, vol. 10, no. 4, pp. 868–874, 2023, doi: 10.20448/jeelr.v10i4.5271.

[25] M. Nadeem, "Distributed leadership in educational contexts: A catalyst for school improvement," *Soc. Sci. Humanit. Open*, vol. 9, no. February, p. 100835, 2024, doi: 10.1016/j.ssaho.2024.100835.

[26] M. Sa'diyah, "The Concept of Multiple Intelligence Education From the Quran's Perspective," *J. Islam. Educ. Res.*, vol. 5, no. 02, pp. 110–122, 2024, doi: https://doi.org/10.35719/jier.v5i2.411.

[27] R. Blaik Hourani, D. Litz, and S. Parkman, "Emotional intelligence and school leaders: Evidence from Abu Dhabi," *Educ. Manag. Adm. Leadersh.*, vol. 49, no. 3, pp. 493–517, 2021, doi: 10.1177/1741143220913552.

[28] F. Wang, "Principals' Self- and Interpersonal Leadership Amid Work Intensification," *J. Sch. Leadersh.*, vol. 31, no. 5, pp. 396–427, 2021, doi: 10.1177/1052684620935383.

[29] F. Abbaspour, R. Hosseingholizadeh, and M. Ş. Bellibaş, "Uncovering the role of principals in enhancing teacher professional learning in a centralized education system," *Int. J. Educ. Manag.*, vol. 38, no. 3, pp. 873–889, 2024, doi: 10.1108/IJEM-12-2023-0654.

[30] A. Jaedun, M. Nurtanto, F. Mutohhari, I. N. Saputro, and N. Kholifah, "Perceptions of vocational school students and teachers on the development of interpersonal skills towards Industry 5.0," *Cogent Educ.*, vol. 11, no. 1, p., 2024, doi: 10.1080/2331186X.2024.2375184.

[31] Y. C. Cheng, "A Typology of Multiple School Leadership," *Educ. Sci.*, vol. 14, no. 1, 2024, doi: 10.3390/educsci14010070.

[32] O. K. T. Kit *et al.*, "Preferred Educational Leaders: Character and Skills," *Eur. J. High. Educ. Acad. Adv.*, vol. 1, no. 2, p. 50, 2024, [Online]. Available: http://e-science.net/index.php/EJHEAA.

[33] Ş. Sezer and T. Uzun, "The relationship between school principals' social-emotional education leadership and teachers' organizational trust and job performance," *Int. J. Leadersh. Educ.*, vol. 26, no. 6, pp. 1062–1081, 2023, doi: 10.1080/13603124.2020.1849812.

[34] A. Heffernan, K. MacDonald, and F. Longmuir, “The emotional intensity of educational leadership: a scoping review,” *Int. J. Leadersh. Educ.*, no. May 2022, doi: 10.1080/13603124.2022.2042856.

[35] B. G. Gimbert, D. Miller, E. Herman, M. Breedlove, and C. E. Molina, “Social Emotional Learning in Schools: The Importance of Educator Competence,” *J. Res. Leadersh. Educ.*, vol. 18, no. 1, pp. 3–39, 2023, doi: 10.1177/19427751211014920.

[36] A. Drigas, G. Papanastasiou, and C. Skianis, "The School of the Future: The Role of Digital Technologies, Metacognition, and Emotional Intelligence," *Int. J. Emerg. Technol. Learn.*, vol. 18, no. 9, pp. 65–85, 2023, doi: 10.3991/ijet.v18i09.38133.

[37] R. Gómez-Leal, A. A. Holzer, C. Bradley, P. Fernández-Berrocal, and J. Patti, “The relationship between emotional intelligence and leadership in school leaders: a systematic review,” *Cambridge J. Educ.*, vol. 52, no. 1, pp. 1–21, 2022, doi: 10.1080/0305764X.2021.1927987.

[38] A. Drigas, C. Papoutsi, and C. Skianis, “Being an Emotionally Intelligent Leader through the Nine-Layer Model of Emotional Intelligence—The Supporting Role of New Technologies,” *Sustain.*, vol. 15, no. 10, 2023, doi: 10.3390/su15108103.

[39] M. Holdo, “Critical Reflection: John Dewey’s Relational View of Transformative Learning,” *J. Transform. Educ.*, vol. 21, no. 1, pp. 9–25, 2023, doi: 10.1177/15413446221086727.

[40] Z. T. Rony, T. S. Lestari, Ismaniah, M. Yasin, and F. M. Lubis, “The complexity of leadership competence in universities in the 21st century,” *Cogent Soc. Sci.*, vol. 9, no. 2, 2023, doi: 10.1080/23311886.2023.2276986.

[41] V. E. Matahela and G. H. van Rensburg, “Self-leadership through self-reflection: guiding nursing faculty in taking ownership of their teaching practices in nursing education institutions,” *Reflective Pract.*, vol. 24, no. 5, pp. 629–643, 2023, doi: https://doi.org/10.1080/14623943.2023.2222075.

[42] B. Ribers, G. Miller Balslev, and C. R. Jensen, “Education, collaboration and pedagogical phronesis: essential dimensions in professional learning and development,” *Prof. Dev. Educ.*, vol. 50, no. 4, pp. 684–699, 2024, doi: 10.1080/19415257.2021.1902835.

[43] P. K. Chopra and G. K. Kanji, “Emotional intelligence: A catalyst for inspirational leadership and management excellence,” *Total Qual. Manag. Bus. Excell.*, vol. 21, no. 10, pp. 971–1004, 2010, doi: 10.1080/14783363.2010.487704.

[44] N. Kaur and M. Hirudayaraj, "The Role of Leader Emotional Intelligence in Organizational Learning: A Literature Review Using 4I Framework," *New Horizons Adult Educ. Hum. Resour. Dev.*, vol. 33, no. 1, pp. 51–68, 2021, doi: 10.1002/nha3.20305.

[45] P. Benoliel and I. Berkovich, “Learning from intelligent failure: an organizational resource for school improvement,” *J. Educ. Adm.*, vol. 59, no. 4, pp. 402–421,

2020, doi: 10.1108/JEA-07-2020-0155.

[46] S. Lombardi, M. Pina e Cunha, and L. Giustiniano, “Improvising resilience: The unfolding of resilient leadership in COVID-19 times,” *Int. J. Hosp. Manag.*, vol. 95, no. February, p. 102904, 2021, doi: 10.1016/j.ijhm.2021.102904.

[47] S. Q. Hashimy, A. Jahromi, I. Naaz, N. Nyamwero, and B. H T, “Nurturing Leadership and Capacity Building for Success: Empowering Growth,” *Int. J. Rehabil. Spec. Educ.*, vol. 3, no. 2, pp. 33–46, 2023, doi: 10.48165/ijrse.2023.3.2.5.

[48] B. Murphy, “The female chief communication officer: An exploration into her leadership traits,” *Public Relations Inq.*, vol. 12, no. 1, pp. 113–133, 2023, doi: 10.1177/2046147X221126164.

[49] A. M. Passarelli, M. P. Trinh, E. B. Van Oosten, and A. Varley, “Communication quality and relational self-expansion: The path to leadership coaching effectiveness,” *Hum. Resour. Manage.*, vol. 62, no. 4, pp. 661–680, 2023, doi: 10.1002/hrm.22156.

[50] J. Ayers, J. Bryant, and M. Missimer, “The use of reflective pedagogies in sustainability leadership education-a case study,” *Sustain.*, vol. 12, no. 17, pp. 1–21, 2020, doi: 10.3390/SU12176726.

[51] A. T. Asmamaw and T. Semela, “Exploring the influence of leader emotional intelligence on faculty engagement in Ethiopian higher education,” *Cogent Educ.*, vol. 10, no. 2, 2023, doi: 10.1080/2331186X.2023.2277547.

[52] A. Haleem, M. Javaid, and R. P. Singh, "Perspective of leadership 4.0 in the era of the fourth industrial revolution: A comprehensive view," *J. Ind. Saf.*, vol. 1, no. 1, p. 100006, 2024, doi: 10.1016/j.jinse.2024.100006.

[53] K. Kozioł-Nadolna, “The role of a leader in stimulating innovation in an organization,” *Adm. Sci.*, vol. 10, no. 3, 2020, doi: 10.3390/admsci10030059.

[54] J.-C. Goulet-Pelletier and D. Cousineau, “The Creative Space Theory as a map to explore the mind,” *Possibility Stud. Soc.*, vol. 2, no. 1, pp. 77–106, 2024, doi: 10.1177/27538699241233195.

[55] L. Wang, C. Cao, X. Zhou, and C. Qi, “Spatial abilities associated with open math problem solving,” *Appl. Cogn. Psychol.*, vol. 36, no. 2, pp. 306–317, 2022, doi: 10.1002/acp.3919.

[56] C. Zhu, R. Klapwijk, M. Silva-Ordaz, J. Spandaw, and M. J. de Vries, “Investigating the role of spatial thinking in children’s design ideation through an open-ended design-by-analogy challenge,” *Int. J. Technol. Des. Educ.*, vol. 34, no. 5, pp. 1733–1762, 2024, doi: 10.1007/s10798-024-09877-7.

[57] D. H. Bowen and B. Kisida, “Investigating Arts Education Effects on School Engagement and Climate,” *Educ. Policy*, vol. 38, no. 5, pp. 1077–1107, 2024, doi: 10.1177/08959048231174880.

[58] A. Alam and A. Mohanty, "Does Musically Responsive School Curriculum

Enhance Reasoning Abilities and Helps in Cognitive Development of School Students?," in *Interdisciplinary Perspectives on Sustainable Development*, 1st Editio., CRC Press, 2023, pp. 1–5.

[59] R. F. Subotnik, P. Olszewski-Kubilius, S. Corwith, E. Calvert, and F. C. Worrell, "Transforming Gifted Education in Schools: Practical Applications of a Comprehensive Framework for Developing Academic Talent," *Educ. Sci.*, vol. 13, no. 7, 2023, doi: 10.3390/educsci13070707.

[60] L. Hunter and E. Frawley, "Engaging Students Using an Arts-Based Pedagogy: Teaching and Learning Sociological Theory through Film, Art, and Music," *Teach. Sociol.*, vol. 51, no. 1, pp. 13–25, 2023, doi: 10.1177/0092055X221096657.

[61] R. Brauer, J. Ormiston, and S. Beausaert, "Creativity-Fostering Teacher Behaviors in Higher Education: A Transdisciplinary Systematic Literature Review," *Rev. Educ. Res.*, vol. XX, no. X, pp. 1–30, 2024, doi: 10.3102/00346543241258226.

[62] L. Markauskaite, B. Schwarz, C. Damşa, and H. Muukkonen, "Beyond disciplinary engagement: Researching the ecologies of interdisciplinary learning," *J. Learn. Sci.*, vol. 33, no. 2, pp. 213–241, 2024, doi: 10.1080/10508406.2024.2354151.

[63] D. Walzer, "Considering leadership pedagogy in creative arts education," *J. Leadersh. Educ.*, vol. 23, no. 1, pp. 91–107, 2024, doi: 10.1108/jole-01-2024-0024.

[64] T. A. Gebremeskel, M. M. Bachore, and E. W. Bushisho, "The effects of multiple intelligence based reading tasks on EFL students reading skills achievements: The case of university students in Ethiopia," *Heliyon*, vol. 10, no. 13, p. e33591, 2024, doi: 10.1016/j.heliyon.2024.e33591.

[65] T.-S. Chang, H.-C. Wang, A. M. Haynes, M.-M. Song, S.-Y. Lai, and S.-H. Hsieh, "Enhancing student creativity through an interdisciplinary, project-oriented problem-based learning undergraduate curriculum," *Think. Ski. Creat.*, vol. 46, no. Desember, p. 101173, 2022, doi: https://doi.org/10.1016/j.tsc.2022.101173.

[66] C. Hou, "Artificial Intelligence Technology Drives Intelligent Transformation of Music Education," *Appl. Math. Nonlinear Sci.*, vol. 8, no. 2, pp. 3383–3392, 2023, doi: 10.2478/amns.2023.2.00338.

[67] A. R. Malik *et al.*, "Exploring Artificial Intelligence in Academic Essay: Higher Education Student's Perspective," *Int. J. Educ. Res. Open*, vol. 5, no. September, p. 100296, 2023, doi: 10.1016/j.ijedro.2023.100296.

[68] M. Küçük, T. Talan, and M. Demirbilek, "The Effect of Creating 3D Objects with Block Codes on Spatial and Computational Thinking Skills," *Informatics Educ.*, vol. 23, no. 1, pp. 125–143, 2024, doi: 10.15388/infedu.2024.02.

[69] C. G. Demartini, L. Sciascia, A. Bosso, and F. Manuri, "Artificial Intelligence Bringing Improvements to Adaptive Learning in Education: A Case Study," *Sustain.*, vol. 16, no. 3, 2024, doi: 10.3390/su16031347.

[70] Y. C. Chew and S. R. Mohamed Zainal, “A Sustainable Collaborative Talent Management Through Collaborative Intelligence Mindset Theory: A Systematic Review,” *SAGE Open*, vol. 14, no. 2, pp. 1–22, 2024, doi: 10.1177/21582440241261851.

[71] A. Ersozlu, M. Karakus, F. Karakas, and D. L. Clouder, “Nurturing a Climate of Innovation in a Didactic Educational System: A Case Study Exploring Leadership in Private Schools in Turkey,” *Leadersh. Policy Sch.*, vol. 23, no. 2, pp. 275–295, 2024, doi: 10.1080/15700763.2022.2129074.

[72] A. L. Green, S. Ferrante, T. L. Boaz, K. Kutash, and B. Wheeldon-Reece, “Effects of the SPARK Teen Mentoring Program for High School Students,” *J. Child Fam. Stud.*, vol. 31, no. 7, pp. 1982–1993, 2022, doi: 10.1007/s10826-022-02298-x.

[73] E. Alieto, B. Abequibel-Encarnacion, E. Estigoy, K. Balasa, A. Eijansantos, and A. Torres-Toukoumidis, “Teaching inside a digital classroom: A quantitative analysis of attitude, technological competence and access among teachers across subject disciplines,” *Heliyon*, vol. 10, no. 2, p. e24282, 2024, doi: 10.1016/j.heliyon.2024.e24282.

[74] M. Tiansoodeenon and P. Sitthitikul, “The Theoretical Review and Practice of Multiple Intelligences in English Language Teaching,” *Learn J. Lang. Educ. Acquis. Res. Netw.*, vol. 17, no. 1, pp. 55–72, 2024, [Online]. Available: https://files.eric.ed.gov/fulltext/EJ1415541.pdf.

[75] A. Madjid, F. M. Suud, and S. Bahiroh, "Teacher Competence, Commitment, and Work Motivation: What Influences Performance in Yogyakarta," *Int. J. Innov. Creat. Chang.*, vol. 13, no. 11, p. 2020, 2020, [Online]. Available: www.ijicc.net.

[76] J. M. R. Asio, C. D. C. Francisco, and A. V. Nuqui, “The Relationship between Multiple Intelligences and Participation Rate in Extracurricular Activities of Students from a Catholic Education Institution,” *Int. J. Prof. Dev. Learn. Learn.*, vol. 3, no. 1, p. ep2107, 2021, doi: 10.30935/ijpdll/10956.

[77] R. Gabriel, “Correlations Between Learning Style Preferences and Arab-Speaking Gulf Region First-Year College Students’ EFL Performance: A Literature Review,” *J. Lang. Teach. Res.*, vol. 14, no. 3, pp. 709–714, 2023, doi: 10.17507/jltr.1403.18.