Innovative Leadership for Professional Education Administrators in the Digital Age

Phongsak Phakamach
Rattanakosin International College of Creative Entrepreneurship, Rajamangala University of Technology Rattanakosin, Thailand
E-mail: phongsak.pha@rmutr.ac.th RCID ID: https://orcid.org/0009-0002-6387-0292

Darunee Panjarattanakorn
Faculty of Education, Rajapruk University, Thailand
E-mail: jimdarunee@hotmail.com RCID ID: https://orcid.org/0009-0003-5633-2039

Autsanee Seenonlee
Faculty of Education, Northeastern University, Thailand
E-mail: autsanee.see@neu.ac.th RCID ID: https://orcid.org/0009-0003-4788-2119

Abstract

Background and Aim: Innovative leadership for professional education administrators in the digital age is an activity of professional education administrators in leading groups or educational organizations that require knowledge and ability to define a vision and exchange that vision with others for willing compliance, the provision of ICT systems, innovation, new knowledge, and methods for accepting change, coordinating and balancing the conflicting interests of members and stakeholders, and doing so to inspire members to act in a way that creates commitment to achieving the goals of educational administration.

Materials and Methods: This article emphasizes innovative leadership for digital age education administrators, which is management under rapid and sudden change. The key factor that will affect the success of the organization is the education administrator who must have knowledge and ability in the form of leadership that must understand the context of technology that has changed the world's society.

Results: This article presents the importance of innovative leadership for professional education administrators in the digital age, with content consisting of knowledge about leadership, the meaning and role of innovative leadership, the importance of innovative leadership for digital age education administrators, the characteristics of innovative leadership for digital age education administrators, including mechanisms and processes of modern education administration of leaders who can lead educational institutions to become organizations of educational innovation in the digital age.

Conclusion: The form of leadership that keeps pace with change is innovative leadership for digital age education administrators, which digital age education administrators must have 10 important characteristics: 1) leadership personality and skills, 2) team leadership, 3) role model, 4) opinion leader, 5) promoting development, 6) leadership communication, 7) learning climate, 8) change management, 9) competencies supporting and developing, and 10) participative administrations.

Keywords: Innovative Leadership, Educational Administration, Digital Age

Introduction

In the digital economy, the world's trade and service patterns have been dramatically transformed. Thailand's export structure over the past 40 years has tended to change in the same direction as newly industrialized countries in Asia, namely Taiwan, South Korea, and Singapore. That is, the importance of resource-based products and labor-intensive products tends to decrease, while science-based products, which require research and development (R&D) as well as creative design, tend to increase continuously (Serdyukov, 2017; Brunetti et al., 2020; Bakir & Dahlan, 2023). At the same time, when considering the proportion of investment and expenditure for research and development with the Gross National Product (GDP), the role and importance to the innovation development process, and innovation also plays a role in making entrepreneurs successful with innovation, promoting a culture of innovation, and building innovative systems and organizations to create strength in the country's competitive advantage in both education and personnel development to keep pace with the changing trends of the global society that are happening, as well as finding new knowledge in modern technology to adapt to life to create benefits and efficiency in work, including developing the country in line with and in the direction of the 20-year national strategic framework is a matter that must be

done seriously. Every country in the world is aware of the rapid changes in all aspects, all of which are looking for ways to adapt their patterns and processes to keep pace with the increasingly competitive global context (Ebekozien et al., 2023; Phakamach, 2023; Mountbatten-O'Malley & Morris, 2025).

In the midst of the rapid changes in the 21st century, from an industrial capitalist system to a transnational industrial capitalist system with higher levels of technological development and management strategies, focusing on the production of high-tech automated goods and services that increasingly use computers and modern technology. This age requires labor and organizations with knowledge and the ability to innovate. Workers must have new knowledge and skills that require them to adapt and learn new jobs quickly, including making expert decisions. Those who will live a quality and happy life must adapt to survive (Edwards-Schachter, 2018; Ebekozien et al., 2023). Children and youth are considered an important force of the nation, so the development of the learning process, the strengthening of content knowledge, the development of important skills, and rationality will be important variables that must occur with the learner. Many countries have given importance and seen the necessity that young people must have skills to go out and live in the 21st century that has changed from the past. Many educational scholars have proposed ideas on the adjustment and development of learning for skills in the 21st century, such as the Network of Collaborative Organizations for Learning Skills in the 21st Century or the Partnership for 21st Century Skills, abbreviated as the P21 network, which consists of both government and private agencies in collaboration with the National Education Association of the United States and various organizations, has presented the "Framework for 21st Century Learning" by combining various knowledge, both specific skills and overall expertise, consisting of core courses, important concepts in the 21st century, learning and innovation skills, information skills, life and work skills, including education support systems. In this core subject matter and learning and innovation skills, there are components called 3R and 4C, consisting of Reading, Writing, Arithmetic, and Critical Thinking, Communication, Collaboration, and Creativity. Especially in the age of learning and digital transformation, it is necessary to join forces closely between those responsible for education and stakeholders to determine policies and procedures for learners to have desirable skills or characteristics according to this new learning framework (Brunetti et al., 2020; Chansirisira, 2022; Phakamach et al., 2022; Bakir & Dahlan, 2023; Mountbatten-O'Malley & Morris, 2025).

Therefore, in the 21st century or digital education, it is necessary to adapt to active learning and use the principle of focusing more on learners, where learners must be able to create knowledge by themselves with teachers as facilitators and suggesting various tools to access knowledge through modern technology, including the introduction of social media to help through synthesized tools to enhance the development of teaching and learning. This is because the advancement of technology and the transition of knowledge is rapid, continuous, and endless. Both learners and teachers must develop themselves into a new world of learning. The environment, social system, economy, and learner behavior have changed. Adjusting the teaching and learning process, applying modern media to stimulate learners' learning is a challenge because the new learning society aims for learners not only to be recipients but also creators of new innovations, which is an important turning point to enter the education system 4.0 (Education 4.0) and transforming to Education 5.0 (Chinchorkar & Jadhav, 2024). Society wants a new generation with discernment, knowing how to distinguish what is appropriate, having new ideas, positive creative imagination, knowing how to learn and share knowledge, understanding the direction of world and social change, creating new products to enter the market, being able to communicate with others confidently, living responsibly, having morality, and not taking advantage of others in Thai society and global society (Ebekozien et al., 2023; Phakamach et al., 2023; Mountbatten-O'Malley & Morris, 2025).

Furthermore, learning in the 21st century will change to advanced learning skills, lifelong learning skills, teaching learners how to find knowledge (Learn How to Use), training to create initiative from direct experience by participating in learning activities, exchanging learning in a learner-centered teaching format (Child Center) (OECD, 2023). Teachers are considered learning directors (Coach) and facilitators in the teaching and learning process instead, ready to adjust teaching methods to be less so that learners can learn more by using educational innovation continuously throughout the system to

keep pace with the changes that are happening (Mountbatten-O'Malley & Morris, 2025). This is the origin of the project to reduce study time and increase learning time of the Ministry of Education's policy that has been implemented since 2015 until now, which focuses on schools participating in the project in the first year, totaling 4,100 schools, by organizing activities that focus on 4H: Head, Heart, Hand, Health, which is important is the improvement of the new study time structure to reduce classroom hours and increase activity hours, while emphasizing the adjustment of teachers' teaching process to allow children to practice thinking analytically and solving problems more. In addition, including the improvement of examinations by using standard central examinations in the form of subjective and objective tests that focus on analytical thinking more and most importantly, those who play an important role in determining policy guidelines and top management in driving educational organizations to succeed as mentioned are "education administrators" or "educational leaders." The consequences of rapid and volatile changes in education (Education Disruption), including educational reform, make the roles and main duties of modern educational institutions at all levels have the characteristics that should be to support thinking tools, being a consultant to personnel within the institution and external innovation units that see the possibilities, including inviting those involved and interested in innovation and creative educational thinking, which in the end, the direction of the institution will be determined by consensus. Educational institutions that will survive in the future (Aas & Paulsen, 2019; Aiharbi, 2021; Khanthap, 2022; Bakir & Dahlan, 2023; Phakamach et al., 2023).

In today's rapidly evolving digital landscape, the role of professional education administrators demands a paradigm shift towards innovative leadership. The traditional models of management are no longer sufficient to navigate the complexities and opportunities presented by emerging technologies. This introduction explores the critical need for leaders in professional education to embrace innovation, not just as an option, but as a fundamental necessity to enhance learning outcomes, streamline administrative processes, and prepare graduates for a digitally driven workforce. Innovative leadership in this context requires administrators to be visionary, adaptable, and willing to challenge conventional approaches (Aiharbi, 2021; Khanthap, 2022). It involves fostering a culture of experimentation, empowering faculty and staff to explore and implement new digital tools and pedagogical strategies. By embracing technologies like AI, data analytics, and immersive learning, these leaders can create more personalized, engaging, and effective learning experiences, ultimately ensuring the relevance and impact of professional education in the digital age. This introduction sets the stage for understanding the key characteristics, challenges, and strategies associated with leading professional education institutions into a digitally transformed future (Phakamach, 2023).

The existing literature on innovative leadership for professional education administrators in the digital age highlights a significant shift in required competencies and strategic approaches. Studies emphasize the need for leaders to move beyond traditional management, embracing a vision that strategically integrates digital technologies to enhance pedagogy, student engagement, and institutional efficiency. Key themes emerge around fostering a culture of innovation, promoting digital literacy among faculty and staff, and navigating the ethical and practical implications of AI, data analytics, and online learning platforms. Research also underscores the importance of adaptability, future-oriented thinking, and collaborative partnerships to effectively lead professional education institutions in a constantly evolving technological landscape (Vandavasi et al., 2020). Furthermore, the literature stresses the critical role of innovative leaders in addressing the digital divide and ensuring equitable access to technology and digital learning resources. It explores various leadership styles that facilitate innovation, such as transformational and distributed leadership, and their impact on organizational change within educational settings. Empirical studies and theoretical frameworks analyze the challenges administrators face in implementing digital innovations, including resistance to change, resource constraints, and the need for ongoing professional development. Ultimately, the literature converges on the idea that innovative leadership is not merely about adopting new technologies, but about strategically leveraging them to achieve enhanced learning outcomes, improve administrative effectiveness, and prepare graduates for the demands of the digital economy (Hooi & Chan, 2022; Bakir & Dahlan, 2023; Lovell, 2024; Aman-Ullah et al., 2024).

Objectives

This article aims to investigate an innovative leadership for professional education administrators in the digital age.
.

Educational Leadership Concepts

Leadership, which is the characteristics and qualities of a leader that is a process in which executives will influence the behavior of others, especially using the art of persuasion to motivate followers to have morale and encouragement in performing their duties with satisfaction. As for educational administrators, they are those who manage work in government agencies, such as permanent secretaries, directors-general, rectors, deans, education administrators, and school administrators, who must have skills and experience to make the work achieve the goals of the educational organization (Li et al., 2024). The use of leadership styles shows the actions of the leader more than the characteristics of the individual, and the use of leadership in motivating, encouraging others to think and show their abilities to benefit the organization, which is important to the components of authority in commanding, the communication process, and leading to the objectives effectively. Currently, there are many different perspectives on leadership that arise from personal or organizational experience, from research results, and from mutual learning, which are diverse perspectives that seek original answers and lead to a paradigm of integrated leadership theory. What are the important components of the leadership model? Holdaway (2013), Chansirisira (2022), Phakamach et al. (2023), and Aman-Ullah et al. (2024) argue that leadership is both a science and an art because leadership requires principles and specific techniques, that is, there are various dimensions in the management process to achieve the goals of the organization according to the conceptual development of the integrated leadership theory paradigm, which brings the appropriate leadership model to integrate with the new body of knowledge that keeps pace with the changes in the world (Global Change).

The digital age is an age of rapid and constant change due to advances and developments in technology and science resulting from human knowledge and ability. All organizations face the world's changing conditions at 3 levels: Level 1: Global Trends, entering the 21st century; Level 2: Regional Drivers, namely the ASEAN Community; Level 3: Local Issues, including inequality, middle-income trap, security crises, politics, economy, and social change (Hooi & Chan, 2022). Under these changing circumstances or contexts, Thailand faces a severe economic crisis and continues to have an impact to this day. Consistent with the writing of Khanthap (2022), who mentioned the characteristics of learners in the 21st century that are a challenge for education administrators, there are 3 points: Critical Thinking, Problem Solving, and Communication Information & Media Literacy and Computing & ICT literacy. Moreover, Phakamach (2023) gave his views on the important skills of learners in this age: 1) being a digital learner, 2) inventive and innovative thinking, and 3) effective communication.

For driving to be consistent and effective with the changes mentioned above, at the organizational level, educational institutions in this age have studied and researched variables or factors that will influence the efficiency or effectiveness of the organization. Variables or factors that will influence the performance of personnel, teachers, and professors are motivation and job satisfaction, including the development of competencies and potential of personnel, one important factor that is recognized as having a great influence is "leadership," both the leadership of education administrators that will lead to the development of agencies, educational institutions, educational personnel, including the quality of learners. As the current situation according to the above statement, therefore, executives with leadership must have influence over other individuals or groups in management to achieve the goals (Aiharbi, 2021; Khanthap, 2022; Berdecia-Cruz et al., 2022; Chansirisira, 2022; Bakir & Dahlan, 2023; Ahmed et al., 2024).

From the study of concepts, theories, and research on a large number of effective leadership, but there is one concept theory that is accepted and widely mentioned in the new social age that requires a new type of leadership, the current age society is a knowledge society, information society, or networked society with the rapid and widespread emergence of ICT systems, high globalization and digital, with horizontal or distributed relationships replacing vertical or command relationships, a new

society that requires digital age leadership that still requires some traditional special characteristics such as empathy, commitment, discipline, faith, etc. What needs to be added are new attitudes, new skills, and new knowledge under the limitations and opportunities of ICT systems and efficient use, especially in 3Cs, including computing, communicating, and content, including multimedia and digital education platforms, which is the view of Sousa and Rocha (2019), Antypas (2021), Chansirisira (2022), Bakir and Dahlan (2023), and Aman-Ullah et al. (2024) that modern education administrators must have leadership, vision, and a new paradigm in determining the direction of the organization that can cope with the continuous and endless changes in the digital age, which is the ability to cope with the sustainable change of the educational organization.

Meaning and Role of Innovative Leadership
Many scholars have opined that "few innovation strategies succeed without leadership." Leaders in many organizations, both public and private, believe that innovation helps their organizations thrive and be effective. Leadership is therefore considered to have a significant influence on becoming an innovative organization. A study by Byrd (2012) and Ahmed et al. (2024) found that the role of leaders and leadership affects the innovative organization in US military units, including the exchange between leaders and members of the organization (Leader-Member Exchange: LMX) with quality, leading to feelings of loyalty, trust, and mutual support, leading to innovation in the organization. It was also found that the Transformational Leadership model is associated with organizational change and innovation. Cho et al. (2019), Aman-Ullah et al. (2024), and Li et al. (2024) explain that transformational leaders influence the ability and potential of followers to express personal interests to achieve the organization's goals. The components of transformational leadership include: 1) having a vision, 2) making goals accepted, 3) intellectual stimulation, 4) providing individual support, 5) expecting high performance, and 6) being a good role model, are related to organizational culture and an atmosphere conducive to innovation.

Innovative leaders value innovation and recognize its importance, seeking to integrate the skills, knowledge, and ideas scattered throughout the organization to work together to create innovation. They are the ones who bring the knowledge that employees have to create innovations for the organization to gain a unique competitive advantage by utilizing new knowledge and innovation, which is an innovation driver that arises from the organization's need to survive and is a key mechanism for organizational growth by doing things differently from what exists, including expanding by continuously improving and developing. The forms of innovation may vary, such as innovation in the form of products, services, or processes, especially changing concepts, ways of thinking, and operating strategies in various fields related to information technology and creativity to create innovation within the organization (Aiharbi, 2021; Antypas, 2021; Chansirisira, 2022; Phakamach, 2023).

Considering the meaning mentioned above, innovation means new things (new services, new production processes, new management, new organizational arrangements, and new labor skills) and new working conditions resulting from the use of knowledge and creativity that are beneficial to the economy and society (Griffin & Moorhead, 2014; Aman-Ullah et al., 2024). Organizations, therefore, need to exist with innovation, which is both the result of operations and the result of processes, such as the process of solving problems that occur in the organization or the interaction process that arises from the relationship between the organization and other key actors through collaborative networks or learning processes, which can include both internal and external organizational knowledge (Fernandez & Shaw, 2020; Bakir & Dahlan, 2023). Therefore, knowledge and learning that occur throughout the organization naturally lead to continuous creative thinking and innovation development. If any organization can create and develop innovations before or better than others, it will enable that organization to move towards excellence better as well. Every organization is therefore continuously seeking ways to develop its own innovation to avoid being inferior to the competitive advantage by setting up departments of innovation directly for the selection of approaches to innovation that are appropriate to the type of organization, including the development of innovative leaders. And for clarity in analyzing the components of innovative leadership (Innovative Leadership) for school administrators have defined the issues in the study as components of innovative leadership in roles, behaviors and

characteristics of innovative leadership that must be appropriate and consistent (Johannessen, 2014; Vandavasi, 2020; Antypas, 2021; Aman-Ullah et al., 2024).

Ariratana et al. (2019), Antypas (2021), Chansirisira (2022), and Bakir and Dahlan (2023) has conducted research and found that leadership behavior that is consistent with the role of innovative leadership should have behaviors that are consistent with the role of leading ideas in change and development, being a cultivator of organizational culture to forge the characteristics of innovators of personnel, being a good role model in behaving until it is accepted by people both inside and outside, being a team leader and participatory management, being a creator of a learning organization atmosphere, being a driver, supporter, and facilitator for personnel to have ideas in creating innovation, and being an executive of the organization. Innovative leader characteristics should have characteristics in terms of personality, skills, and social skills, such as being a thought leader, being a good role model, being a team leader, participating, being a creator of a learning organization atmosphere, being a facilitator, and giving rewards for success, daring to take risks, daring to change, having an open mind, and having skills related to vision leading change, transferring ideas into practice, ability to learn, competence in stimulating innovation, creativity, motivating others, communicating effectively, emotional maturity, and social responsibility. However, the innovative leadership of educational institution administrators is an important characteristic that can promote and support education administrators to be able to manage educational institutions to have better performance, especially in the management of academic and research work to be effective and efficient for the creation of modern innovation.

The important role of the top management in driving the organization towards becoming an innovative organization in education can summarize the characteristics of the management of an innovative organization in education in the issue of having innovative leadership as follows (Erhan et al., 2022; Phakamach et al., 2023; Aman-Ullah et al., 2024):

1) Executives in the organization have a clear vision, policies, and work framework, are attentive to strategic analysis, are proactive leaders, look for opportunities, are open to change, adapt quickly to change, are sensitive to change, and are willing to take risks, support organizational management changes to achieve goals, and are ready to support management towards an innovative organization, attach importance to the correct thinking process in current management, and are ready to support the organization to develop towards future competition, and are ready to support budget for continuous organizational development, and support research for development.

2) Executives in the organization are ready to listen to opinions, are good role models for personnel, support the development of knowledge and skills of personnel that are in line with the goals, attach importance to mobilizing talented people within the organization to work towards the goals, know how to manage and invest in new technologies, understand the art of managing teams of knowledgeable and talented people to be most effective, encourage personnel to be leaders, understand the role of technologies related to the organization, and support the use of technology appropriately and in a timely manner.

3) Executives in the organization are attentive to the development of work processes, create transparent work processes, participate and distribute administrative power, create work processes for customers to participate more, create an atmosphere that listens and is accessible, communicate clear information, understand their own role, have skills in managing people and work, understand and can manage on cultural diversity.

The important role of human resource managers of educational organizations to successfully move towards becoming an innovative educational organization can be summarized as follows (Phakamach, 2023; Li et al., 2024):

1) Human resource managers must work together with educational organization executives and be business partners and support each other. Human resource managers in the organization are professional managers, learn and understand the organization's business well. The actions of human resource managers consider the business strategies of educational organizations, focus on learners as the main focus, are innovative thinkers, thoughtful, observant, problem solvers, and are proactive strategic managers in innovative human resource management.

2) Being a change manager, especially in times of rapid and volatile educational change (Education Disruption), can work under pressure and work well with others, lay the process of developing people to accept the organizational culture strongly, have a process of developing people to keep up with the changes, prepare to manage multiple generations of people, and be ready to be a change leader, develop a transparent and fair evaluation system, including being able to allocate personnel appropriately to work towards goals (Feng et al., 2016; Sutiyatno et al., 2022; Bakir & Dahlan, 2023).

3) Human resource unit managers must organize the structure of the human resource unit to be small and compact, define clear personnel development policies that are diverse, support the use of technology to perform work efficiently, and be a unit to develop the knowledge and ability of personnel in educational organizations to be equivalent to international standards.

4) Human resource unit managers are supporters and coordinators to ensure consistency throughout the organization, including being an integrator of maintenance for continuous sustainability from the selection of people into educational organizations, developing and maintaining good and talented people with the organization, and developing human resource practitioners to be able to work professionally (Bakir & Dahlan, 2023).

In summary, innovative leadership transcends traditional management by emphasizing vision, adaptability, and a proactive embrace of change. Its meaning lies in the ability to inspire and guide organizations towards novel solutions and improved outcomes, particularly in dynamic environments. The role of innovative leadership is multifaceted: it fosters a culture of creativity and experimentation, empowers individuals to contribute their unique ideas, and strategically implements new approaches to achieve organizational goals. Ultimately, innovative leadership is crucial for navigating uncertainty, fostering growth, and ensuring long-term relevance and success in an ever-evolving world, driving progress and creating a competitive edge.

The Importance of Innovative Leadership for Digital Age Education Administrators
The current situation of the world's changes in the digital age, especially in the areas that affect the administration of educational institutions, including education administrators, school administrators, and learners in the digital age (Li et al., 2024). If those directly responsible lack understanding of this change and do not manage learning appropriately for learners, it will cause learners to lack understanding in the changes of the digital world. The role of education administrators in the digital age must be able to facilitate, support, promote, and participate in high-level competition amidst the currents of globalization in economics, society, and politics, which are under the conditions of adjusting competition to create advantages and the determination of the global society that proceeds quickly and violently (Hooi & Chan, 2022; Bakir & Dahlan, 2023; Aman-Ullah et al., 2024).

Leaders are very important to development. Administrators or leaders with digital age innovative leadership can make the efficiency and effectiveness of work in educational organizations higher. The development and importance of this according to the views of theorists and academics are as follows (Phakamach, 2023; Lovell, 2024):

Bakir and Dahlan (2023), Phakamach et al. (2023), Tran Pham and Nguyen Le (2024), and Aman-Ullah et al. (2024) have opined that the present is a new society, a society of change under the currents of globalization, changes in the context of educational institutions in the digital age, allowing administrators to accept technology, innovation and changes, especially changes in the culture of educational institutions that are complex and challenging for various reasons. Administrators must have special characteristics and keep pace with technological changes according to the views of digital age innovative leadership. If considered according to the role and function as a factor that promotes the new knowledge society, it must consist of:

Awareness Building Skills, which means being aware of the importance of ICT systems and educational innovation for the development of education at all levels to help achieve success in education management.

Resource Mobilizing Skills, by using ICT systems and educational innovation for educational development in a variety of ways and covering all dimensions of digital age educational organization administration.

Operational Skills, include having service activities, management, and use with modern ICT systems and educational innovation.

Structural Leadership, that is, the revolution of ICT systems and educational innovation is not just the use of ICT systems and educational innovation, but also a movement towards a new form of digital social distribution as well, requiring structural leadership skills as well.

Zheng et al. (2019) mentioned the reasons for the need for new educational changes in the digital age, which is that current education management is not really working and conditions in the world have changed, but education in the system used is still preparing for the world in the past more than preparing for the world in the possible future. Successful learners must be able to think creatively and independently, be able to apply learning strategies to new situations, and to stand in the future world happily in both life and career, they must adapt themselves to keep up with the changes, which is consistent with the leaders or administrators in the age of change (Transformational Leadership) of the future world. Leadership must have important and necessary characteristics in this century, including Disciplined Mind, Synthesizing Mind, Creative Mind, Respectful Mind, and Ethical Mind, etc.

Ariyani et al. (2021) mentioned the importance of change in the globalized world that change is the responsibility of administrators and what society needs in the present age is highly effective leadership that is necessary to stimulate and facilitate change in the age of the learning society and adaptation to the ever-changing external environment, and to bring change to a better goal, you must start by changing yourself first, and must encourage others to change accordingly, to lead others to the goals of the digital age with the use of various ICT systems.

Many academics such as Khalili (2017), Zheng et al. (2019), Vandavasi et al. (2020), Chansirisira (2022), Phakamach et al. (2023), Tran Pham and Nguyen Le (2024) including Li et al. (2024) have reported research results from finding the components of innovative leadership and found that the components of innovative leadership for professional digital age education administrators can be summarized into 10 components, as shown in Figure 1, which consists of:
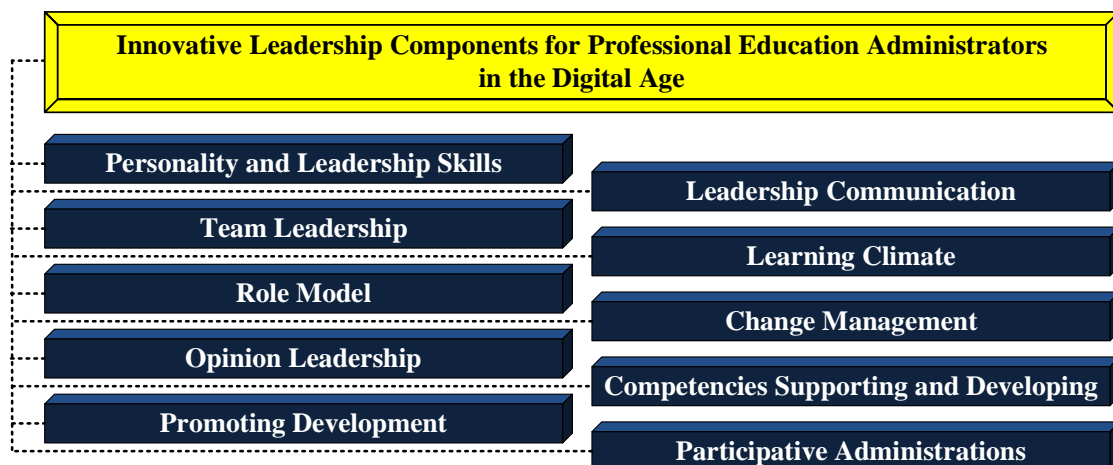

Figure 1 Innovative leadership components for professional education administrators in the digital age.

Component 1: Personality and Leadership Skills, including creating leaders by speaking and acting as leaders, being virtuous and ethical, adhering to and treating personnel with fairness, being open-minded to express and listen to opinions, understanding the nature of innovation in the institution, being fond of challenges, being a spiritual education administrator, understanding the process of innovation development for education administration, being able to define the vision, policies, direction and strategies of the institution by organizing the structure to be flexible, creating a working atmosphere as siblings, being able to adjust the personality of personnel in the institution to be modern people, being able to instill the concept of service, respect and importance to each other, being a leader who can develop and use management innovation until high-quality work is produced, including skills in stimulating innovation creation, being able to create a performance evaluation system in the development of innovation and giving rewards or rewards in a concrete, fair and acceptable manner,

being able to create sustainable innovation through the process of developing people's competencies, being a leader who understands the different nature between managing innovation projects and managing institutions, being responsible to society and the nation.

Component 2: Team Leadership, including being a role model of continuous learning, being a mentor to teach executives who will step up to inherit positions, being a participant in educational activities of all forms, being a manager of innovation projects, being a follower to evaluate performance in innovation, being a driver for everyone to have public ideas, creating personnel to be teachers and knowledge transmitters, providing a system to create continuous learning opportunities, giving advice and knowledge about creating educational innovation, organizing the institution structure to be flexible according to the innovation creation plan, being a leader who keeps up with changes, being a person who sets a clear vision and plans strategies, being an innovation manager to have a system of searching for knowledge, information from various sources, and being a creator of a creative thinking potential assessment system.

Component 3: Role Model, including being a leader with behavior to expand and exchange opinions among leaders or executives, giving encouragement to personnel in studying, researching, practicing and improving various works by themselves, practicing various educational activities by considering the development of innovation and the impact that will occur with the development of personnel, learners, and communities, working with a focus on long-term results until personnel can have a habit of self-development, carefully and systematically analyzing work systems, working with communities and other agencies creatively, having team working behavior in searching for knowledge, team learning, cooperating to solve social problems, and creatively transmitting knowledge, being a good role model in writing academic articles and standard research.

Component 4: Opinion Leadership, including being a person who persuades personnel to agree with the adjustment of management formats, having creative ideas to adjust new work processes to be more flexible, adjusting new institution strategies, being a person who sparks ideas, giving guidance in developing innovation and good practices to personnel, knowing how to think outside the box to create differentiation and create competitive ability, being able to convey and express scientific opinions, being a person who provides knowledge and supports the development of personnel's thinking to be systematic, being a person who instills belief and encourages personnel to dare to face challenges when encountering difficulties in performing their duties, being a person who initiates, invents, and develops innovation with creative thinking, being a leader who benefits society in the development of national education.

Component 5: Promoting Development, including being a person who promotes self-development and being a good role model for personnel at all levels, being a person who gives rewards for success, being a leader who introduces new management principles to use to have a positive effect on creating innovation throughout the institution, being a representative of the institution in communicating to build relationships both within the institution, between the institution and other organizations for creating new innovations, promoting and supporting the appointment of innovation consultants, promoting the acceptance of creative new things, sending expert personnel to visit other organizations or using external experts as mentors with the institution, including being a person who can build networks and good relationships with individuals both inside and outside the institution, especially building networks of innovators at both national and international levels.

Component 6: Leadership Communication, including being a person who can communicate with people at all levels in the institution effectively, being a leader with behavior to promote and encourage personnel to choose to work or solve complex problems, being able to adjust the appropriate balance between the concepts of closed and open innovation management, being a person who can motivate others to agree, communicating to create understanding in the innovation development process, having high-level skills in various and modern digital communication, being a person who can coordinate work with agencies and individuals in many forms, all levels, including understanding the nature of each organization and individual.

Component 7: Learning Climate, including creating an atmosphere of learning exchange, being a creator of a learning organization atmosphere, having a creative academic discussion group, being an

academic and professional role model, having skills of being a promoter and facilitator for lifelong learning, diligently participating in academic seminars both nationally and internationally, giving colleagues the opportunity to choose the appropriate approach for themselves and practice until they can continuously develop their potential, supporting personnel to feel successful until they create a leadership image at all levels to lead to a lifelong learning organization.

Component 8: Change Management, including choosing innovation, innovation management techniques, internal supervision, quality assurance of education, and improving personnel to know their potential in the age of change, being a person who dares to speak and present new and different ideas, being a risk-taker and daring to change, having knowledge and ability to solve problems in digital age human resource management, having skills in vision leading change, including analyzing trends and directions of educational change, being a developer of work plans, planning strategies suitable for constraints and limitations, choosing and improving the use of various innovations that are relevant to the educational situation, creating opportunities for development in all situations, being always vigilant, including seeing changes in all aspects and future changes.

Component 9: Competencies Supporting and Developing, including being a leader with behavior of creating an atmosphere of trust, giving colleagues the opportunity to express opinions and try new things, striving to develop colleagues to be able to work to their full potential, supporting all personnel to use their potential to the fullest, stimulating, provoking, and challenging personnel to feel ownership of innovation, periodically praising success, creating academic quality and standards, creating career advancement, having short-term and long-term personnel competency development plans.

Component 10: Participative Administrations, including creating a participatory management system for all sectors, considering and examining opinions together, regularly discussing and exchanging learning with personnel, being able to build trust and a transparent atmosphere, allowing personnel to participate in striving to jointly develop educational innovation, creating participatory behavior in various innovation activities of the institution, being a person who presents work and continuously disseminates the institution's innovation work.

In summary, the importance of change is the responsibility of leaders who have leadership and are needed by society in the present age. It is necessary to stimulate and facilitate change and adaptation to the ever-changing external environment, including rapid and volatile changes, to bring about changes in people and work practices for the better. Leaders must be able to change the needs that are met, create ways for the organization to succeed and prosper in a better way than before (Khalili, 2017; Phakamach et al., 2023; Aman-Ullah et al., 2024).

Characteristics of Innovative Leadership for Digital Age Education Administrators

From the changing context of educational institutions in the present age, the important thing to be aware of is that leaders or education administrators must be knowledgeable and up-to-date with the changes in the present and the future, and have important characteristics of digital age innovative leadership from the principles and perspectives of academics as follows:

Phakamach et al. (2023) and Aman-Ullah et al. (2024) have given perspectives on the digital age leadership of education administrators that must have the following characteristics:

1) Become Digitally Fluent by accepting that change is important to entering the digital world, recognizing the need for digital fluency, and integrating digital thinking into management as part of the daily development of the educational institution.

2) Develop New Capabilities by encouraging administrators at all levels, teachers, professors, and educational personnel to develop digital competencies because the more administrators, teachers, professors, and educational personnel have digital capabilities, the more they will increase their potential to create things that are valuable to the educational institution.

3) Willingness to Experiment means using electronic devices and tools, using online multimedia such as Twitter to perceive public sentiment, to maintain customer standards, and to build good relationships with customers, which requires agility, rapid processes, and willingness to experiment with innovation and new things (Alim et al., 2019).

4) Understanding that technology that changes modern society has an impact on education and business in all dimensions. Leaders must understand the behavioral, economic, and social changes resulting from the emergence of technology and the impact on the education and business sectors at both the organizational and individual levels.

5) Promote Collaborative Environments by not leaving the ICT department isolated or leaving it meaningless. Digital must permeate every part of the organization and affect every link in the value chain. ICT technology is important to the organization's strategy. At the same time, the ICT system also empowers administrators, teachers, professors, and educational personnel to manage work to achieve the goals of the educational institution as well. Promoting the use of digital tools to complement the network of the educational institution and using the internet and multimedia networks extensively to send culture and a collaborative working environment with teamwork (Sutiyatno et al., 2022).

6) Use the Information, not just the Technology. There is a change of data into information for decision-making to improve the efficiency of administration covering all dimensions of education administration.

Sheninger (2014), Håkansson Lindqvist and Pettersson (2019), and Aman-Ullah et al. (2024) have presented the pillars of digital leadership and innovative leadership, which is the approach to using technology in important digital age educational institutions, including using technology as a tool for education administrators as follows:

1) Communication: Conducting various operations through communication channels through social media and various platforms that are diverse, free of charge, and effective communication channels such as websites, LMS modules, Facebook, Generative AI, TikTok, Instagram, Twitter, and Line, etc.

2) Public Relations: Telling stories of ourselves, colleagues, agencies, and organizations in various matters. Education administrators must be able to define a model that is the foundation for positive public relations through the use of social media tools creatively.

3) Branding: In the business world, it is necessary to build the image of the organization or brand and the impact on consumers. For educational institutions, it is necessary to build confidence in the quality and standards of education for parents, communities, and all stakeholders in the present and the future to be confident in the management of the institution.

4) Professional Growth or Development: By learning social media and various forms of educational platforms for education administrators, they can create their own learning network to meet the diverse learning needs, providing ICT system resources, accessing knowledge, receiving opinions, contacting experts, and leadership by using technology to support the exchange of learning and knowledge development of professional administrators.

5) Re-Envisioning Learning Spaces and Environments: When education administrators understand the role and principles of using technology in educational institutions, starting with a sustainable change process, the next step is to adjust the environment that supports the development of necessary skills and is consistent with the real world. By education administrators having to define a vision and strategic plan in creating learning spaces that are consistent with the research of Ariyani et al. (2021) and Phakamach et al. (2022), which found that administrators as organizational leaders must have leadership in setting strategic plans that are consistent with the organization's vision, adjusting the environment of the educational institution, and developing appropriate learning resources such as automated libraries, smart classrooms, and educational technology media.

Phakamach et al. (2023) and Li et al. (2024) mentioned the goals of Thai and global education reform, one important thing is the learning environment that education administrators in the digital age must create a wisdom-based society, create an environment conducive to education management, promote the use of ICT systems as a factor promoting learning and use it in an integrated manner appropriately in accordance with the development of learners of each age.

Ariyani et al. (2021), Berdecia-Cruz et al. (2022), Sutiyatno et al. (2022), and Aman-Ullah et al. (2024) gave a perspective on the leadership called "Innovative Leadership" that will have a role and function in driving the organization differently in many dimensions, consisting of:

1) To drive the organization to grow rapidly, leaders must combine the "3 C" factors together: (Climate) the working environment, (Culture) the organizational culture, and (Creativity) creativity conducive to teamwork, including creating a culture of accepting mistakes that may occur in creating new things.

2) Leadership in the digital age must push agencies to invent new innovations or services continuously. If there is no new S-Curve or it is "too slow," the growth of the organization will stagnate and decline rapidly because change in the digital age will last long. Leadership will not be enough to "win once," as an example of Steven Jobs, who showed the leadership that pushed Apple to create new products that create a different user experience to the market every year.

3) When it is time for change, leadership in the digital age can adjust the organization's strategy by creating a whole new business model or switching to a similar business, can take advantage of the knowledge, expertise, and potential of existing personnel.

4) Doing business in the digital age must face pressure from rapidly changing technologies that destroy businesses in organizations that do not adapt in time until they collapse (Disruptive Technology). Leadership in the digital age must dare to develop new innovations or services to replace old activities or services that are becoming obsolete.

5) Leadership in the digital age must understand the characteristics of "Digital Worker," believe in the technology skills (Digital Native) that these people have and give opportunities for all colleagues to express creative ideas, have freedom in decision-making and create full work.

6) Organizations in the digital age are beginning to introduce automation systems or AI robots to work with or replace humans more, called "Collaborative Robot" or "CoBot," so it is necessary for executives to understand the principles of this change as well.

Gardner (2011), a professor of education and psychology at Harvard University, is a person with many writings on education, with famous writings that have affected the education sector in the United States and countries around the world, is the concept of multiple intelligences mentioned in the book (Gardner, 2011), with the concept of multiple intelligences theory is a concept that causes change and education reform that focuses on the development of complete human beings, that is, administrators or leaders with leadership must be able to adapt themselves to keep up with the changes, which must have characteristics with important and necessary components in being a leader in the digital education age as shown in Figure 2, which must consist of:

Disciplined Mind means expertise in thinking about a subject in at least one branch, which is a form of cognition that is separated according to the specifics of the discipline or according to the duties of a profession that is practiced regularly for the development of skills and understanding, have high self-discipline, without expertise in any way, it is as if being assigned to be under the control of others.

Synthesizing Mind means the ability to perceive information from many sources, understand and evaluate information without bias and combine it into new information that is meaningful to the synthesizer and others.

Creative Mind means the ability that is beyond the existing rules. The creative mind must be one step ahead of the most complex computers or robots at least, and the important components are (1) Originality, (2) Fluency, (3) Flexibility, and (4) Elaboration.

Respectful Mind means seeing the value and importance, recognizing the goodness inherent in other people and in other things and treating that person with sincerity.

Ethical Mind means behavior or actions of various activities from the real virtuous conditions, which is necessary to make the administration of the educational institution run smoothly and make colleagues live together happily.

Figure 2 Characteristics with important and necessary components in being a leader in the digital education age.

Conclusion, Discussion, and Recommendations

1. Conclusion

The consequences of rapid and volatile changes in education, including educational reform, make the roles and main duties of modern educational institutions at all levels have the characteristics that should be to support thinking tools, being a consultant to personnel within the institution and external innovation units that see the possibilities, including inviting those involved and interested in innovation and creative educational thinking, which in the end, the direction of the institution will be determined by consensus. Educational institutions that will survive in the future under the rapidly changing global environment must rely on creative thinking and be able to effectively utilize the potential of people in the institution without adhering to old rules that limit the imagination of people in the education sector. Moreover, educational leaders play an important role in creating leadership maturity to make the educational management process of each institution achieve its goals and keep pace with the changes.

Furthermore, the importance of educational institutions that must support the driving of research work cannot be limited only to the function of academic support for research work to adjust academic positions only, but should start from cultivating innovative thinking at the basic level for researchers and inventors of educational institutions both domestically and internationally who are interested in bringing research results to further academic development, as if being a connector for the supply and demand of innovation work within various educational institutions to meet, focusing only on work that can be used for real benefit and is beneficial to learners only.

Innovative leadership for professional education administrators in the digital age demands a forward-thinking and adaptable approach. These leaders must champion the strategic integration of emerging technologies like AI, data analytics, and immersive learning environments to enhance curriculum delivery, student engagement, and administrative efficiency. They need to foster a culture of experimentation and continuous improvement, empowering faculty and staff to embrace digital tools and pedagogical innovations. This involves not only understanding the technological landscape but also anticipating future trends and their potential impact on professional education, ensuring graduates are equipped with the skills and competencies needed to thrive in a rapidly evolving digital world. Furthermore, innovative leadership in this context requires a strong focus on digital equity and accessibility, ensuring that all learners have the necessary resources and support to succeed in digital learning environments. It also necessitates navigating ethical considerations related to data privacy and the responsible use of AI. These leaders must be skilled communicators and collaborators, building partnerships with technology providers, industry stakeholders, and other educational institutions to drive innovation and share best practices. Ultimately, their vision should center on leveraging digital tools to create more personalized, engaging, and effective professional education programs that meet the demands of the digital economy.

2. Discussion

The discussion surrounding innovative leadership for professional education administrators in the digital age centers on the imperative to move beyond traditional hierarchical structures and embrace a more agile, adaptive, and visionary approach. Leaders are challenged to cultivate a culture of experimentation and risk-taking, empowering faculty and staff to explore and implement emerging technologies that can revolutionize teaching methodologies, enhance student engagement, and streamline administrative processes. This necessitates not only a deep understanding of the evolving digital landscape, including AI, data analytics, and immersive learning, but also the ability to strategically integrate these tools in a way that aligns with the institution's mission and goals. Furthermore, effective discussion must address the ethical considerations and equity implications inherent in digital transformation. Leaders must champion digital inclusion, ensuring all learners have equitable access to technology and support, while also navigating complex issues related to data privacy and the responsible use of AI. Fostering collaboration with technology providers, industry partners, and other educational institutions is also crucial for staying at the forefront of innovation. Ultimately, the discourse emphasizes that innovative leadership in this era is about creating a future-ready professional education ecosystem that is responsive to the demands of the digital economy and equips graduates with the skills and competencies needed to thrive.

From the analysis of all the information mentioned above, it can be concluded that the components of innovative leadership for digital age education administrators consist of (Phakamach et al., 2023; Lovell, 2024):

1) Personality and leadership skills, which innovative leaders must clearly demonstrate these abilities as the Trait Leadership Theory that believes that successful leaders will have special characteristics different from others, such as having outstanding personal traits, and if the leader is a person with social skills, they will be taken care of by colleagues. Leaders should seek knowledge, invent, discover, and experiment with new innovations to solve problems and develop learners to have quality according to various standards set.

2) Team leadership, teamwork will be successful if there is an effective leader, so the team leader must create leadership and choose appropriate behaviors or methods, based on existing abilities combined with serious training to have leadership, with necessary skills consisting of (1) Communication skills, (2) Planning skills, (3) Organizing skills, (4) Coaching skills, (5) Motivation skills, and (6) Negotiation skills, etc.

3) Role model, if the leader believes in certain behaviors that are shown to create innovation, the leader must show natural behavior to be a model for followers to follow without embarrassment, as Robert and Christopher (2010) describe that leaders should have behaviors that are examples for followers to see, such as showing academic exemplary behavior in accordance with what they say and want personnel to behave as they want by making themselves lifelong learners, while encouraging and supporting followers to do the same in being creators of new innovations for the organization.

4) Opinion leader, innovation in organizations is not difficult to occur if personnel have ideas that lead to innovation, which is what leaders must create for personnel, as the Transformational Leadership Theory that leads the organization to a new direction by creating inspiration, inspiring, and stimulating the spirit of the team to be lively, enthusiastic, have a good attitude, and have the ability to travel to achieve goals.

5) Promoting development, innovative leaders should do everything to promote and develop innovation in the organization, as Drucker (2015) mentioned about leaders that leaders should build a network of cooperation among stakeholders, promoting good and talented people to be able to develop themselves significantly, giving rewards or cheering the team in any form is one way to be a promoter of innovation development in the organization.

6) Leadership communication, leaders should involve personnel in considering and deciding on opinions in creating innovation to get diverse opinions and can bring those ideas to expand into practice with effective leadership communication.

7) Learning climate, learning exchange is one way of innovation in the organization by providing a system to create learning opportunities for personnel continuously in the long term to be a channel for personnel to develop themselves into creative leaders.

8) Change management, as a manager, they are the ones with both power and duties related to the occurrence of innovation in the organization, if the manager has leadership, they can change the organization, or it can be said that the manager will be the one to determine the direction of the organization and the achievement of the organization will depend on the management ability of the manager.

9) Competencies supporting and developing, it can be said that the success in the operation of the group is the result of leadership behavior, if the leader provides support in all forms by giving what is necessary and promoting, including giving encouragement to be able to work to their full potential, as the Path-Goal Theory that describes supportive leadership as showing concern for the well-being and personal needs of the workers.

10) Participative administrations, the participation of leaders is an accelerator for innovation as the Path-Goal Theory describes participatory leadership as a leader who consults with followers in making decisions, asking for opinions and suggestions, including supporting participation in important decisions in modern organizational management.

In addition, it can be further summarized that the components of innovative leadership are also consistent with research on leadership characteristics in administration, academics, personality, and ethics, morality, and research that presents a model of component characteristics of important innovative leaders, namely personality, competence, roles and duties, and social characteristics as the main component characteristics of prominent innovative leaders.

It can also be conclude that administrators of educational institutions in the age of educational reform must have knowledge and ability in educational management, have a vision in educational administration to keep up with the changes, have innovative leadership, have acceptable human relations of those involved, and have democracy to lead to learning reform for all learners to have knowledge, ability, personality, and qualifications according to the educational curriculum truly (Antypas, 2021). Therefore, administrators of educational institutions at all levels who are effective in the age of educational reform should have many important characteristics combined, such as developers, problem solvers, decision makers, compromisers, conflict managers, diplomats, planners, administrators, scholars, technologists, innovators, and public relations officers, etc., which will allow administrators to link this knowledge to develop institutions and develop graduates to be knowledgeable and qualified for Thailand in the future (Phakamach et al., 2023; Lovell, 2024). Finally, all the content mentioned can be applied to develop and build educational organizations to be efficient organizations in the digital age education.

3. Recommendations

To foster innovative leadership among professional education administrators in the digital age, institutions should prioritize professional development programs focused on digital literacy, emerging technologies, and change management. Leaders should actively cultivate a culture of experimentation and collaboration, creating spaces for faculty and staff to explore new digital tools and pedagogical approaches without fear of failure. Furthermore, institutions must invest in robust technological infrastructure and provide ongoing support for digital initiatives, while also developing clear ethical guidelines and strategies to ensure digital equity and accessibility for all learners. Administrators should also actively engage with industry partners and other educational institutions to stay abreast of technological advancements and best practices. They should champion data-driven decision-making, leveraging analytics to understand student needs and the effectiveness of digital interventions. Finally, fostering a shared vision for digital transformation and empowering faculty and staff to contribute to this vision are crucial for creating a sustainable culture of innovation that prepares graduates for the demands of the digital economy.

References

Aas, M., & Paulsen, J. M. (2019). *National strategy for supporting school principal's instructional leadership: A Scandinavian approach*. Journal of Educational Administration, 57(5), 540–553. https://doi.org/10.1108/JEA-06-2018-0115

Ahmed, F., Naqshbandi, M. M., Waheed, M., & Ain, N. U. (2024). *Digital leadership and innovative work behavior: Impact of LMX, learning orientation and innovation capabilities*. Management Decision, 62(11), 3607–3632. https://doi.org/10.1108/MD-01-2023-0072

Aiharbi, I. B. (2021). *Innovative leadership: A literature review paper*. Open Journal of Leadership, 10, 214–219. https://doi.org/10.4236/ojl.2021.103014

Alim, N., Linda, W., Gunawan, F., & Saad, M. S. (2019). *The effectiveness of Google Classroom as an instructional media: A case of State Islamic Institute of Kendari, Indonesia*. Humanities & Social Sciences Reviews, 7(2), 240–246.

Aman-Ullah, A., Aziz, A., Mehmood, W., Vafin, A., & Hassan, M. (2024). *Innovative leadership and sustainable performance: A moderation study through personality traits*. Journal of Applied Research in Higher Education, 16(5), 2126–2139.

Antypas, G. (2021). *Innovation in education—Administration and actions of encouragement and support in primary education*. European Journal of Education Studies, 8(10), 202–218. https://doi.org/10.46827/ejes.v8i10.3979

Ariratana, W., Tang, K. N., & Sirisooksilp, S. (2019). *The effect of innovative leadership on competency of creating high performance organization*. Kasetsart Journal of Social Sciences, 40(2), 311–318.

Ariyani, D., Suyatno, & Zuhaery, X. M. (2021). *Principal's innovation and entrepreneurial leadership to establish a positive learning environment*. European Journal of Educational Research, 10(1), 63–74.

Bakir, A., & Dahlan, M. (2023). *Higher education leadership and curricular design in Industry 5.0 environment: A cursory glance*. Development and Learning in Organizations, 37(3), 15–17.

Berdecia-Cruz, Z., Flecha, J. A., & Ortiz, M. (2022). *The gender differences in innovative mentality, leadership styles and organizational innovative behavior: The case of the "40 Under 40" and their impact on organizational success*. European Business Review, 34(3), 411–430.

Brunetti, G., Petrosillo, I., & Salvia, R. (2020). *Exploring urban resilience thinking for dealing with crises: Experiences from Italy*. Sustainability, 12(4), 1286.

Byrd, M. (2012). *The anatomy of the innovative organization: A case study of organizational innovation within a military structure* (Doctoral dissertation). University of Southern California.

Chansirisira, P. (2022). *The innovation leadership model for school principal under the Provincial Administrative Organizations in Province Zone Roi - Kaen - Sara - Sin, Northeastern Thailand*. Journal of Management Information and Decision Sciences, 25(S2), 1–12.

Chinchorkar, S., & Jadhav, J. (2024). *Commentary: Transforming Education 4.0 to Education 5.0: Sustainable education*. Journal of Research in Innovative Teaching & Learning, 17(2), 408–413.

Cho, Y., Shin, M., Billing, T. K., & Bhagat, R. S. (2019). *Transformational leadership, transactional leadership, and affective organizational commitment: A closer look at their relationships in two distinct national contexts*. Asian Business & Management, 18(3), 187–210.

Drucker, P. (2015). *Innovation and entrepreneurship*. Routledge.

Ebekozien, A., Aigbavboa, C., & Aliu, J. (2023). *Built environment academics for 21st-century world of teaching: Stakeholders' perspective*. International Journal of Building Pathology and Adaptation, 41(6), 119–138.

Edwards-Schachter, M. (2018). *The nature and variety of innovation*. International Journal of Innovation Studies, 2(2), 65–79.

Erhan, T., Uzunbacak, H. H., & Aydin, E. (2022). *From conventional to digital leadership: Exploring digitalization of leadership and innovative work behavior*. *Management Research Review, 45*(11), 1524–1543.

Feng, C., Huang, X., & Zhang, L. (2016). *A multilevel study of transformational leadership, dual organizational change and innovative behavior in groups*. *Journal of Organizational Change Management, 29*(6), 855–877.

Fernandez, A. A., & Shaw, G. P. (2020). *Academic leadership in a time of crisis: The coronavirus and COVID-19*. *Journal of Leadership Studies, 14*(1), 39–45.

Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences*. Basic Books.

Griffin, R. W., & Moorhead, G. (2014). *Organizational behavior: Managing people and organizations* (11th ed.). South-Western Cengage Learning.

Håkansson Lindqvist, M., & Pettersson, F. (2019). *Digitalization and school leadership: On the complexity of leading for digitalization in school*. *International Journal of Information and Learning Technology, 36*(3), 218–230.

Holdaway, D. (2013). *Foundations of literacy*. Heinemann Educational Books.

Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences* (3rd ed.). Basic Books.

Hooi, L. W., & Chan, A. J. (2022). *Innovative culture and rewards-recognition matter in linking transformational leadership to workplace digitalization?* *Leadership & Organization Development Journal, 43*(7), 1063–1079.

Johannessen, J.-A. (2014). *Innovative leadership in organizations: The road to innovation performance*. *Problems and Perspectives in Management, 12*(2), 139–152.

Khalili, A. (2017). *Creative and innovative leadership: Measurement development and validation*. *Management Research Review, 40*(10), 1117–1138.

Khanthap, J. (2022). *Innovative leadership factors and leader characteristics that affect professional learning community of primary schools in Bangkok and its vicinity*. *World Journal of Education, 12*(4), 50–58.

Li, C., Murad, M., Ashraf, S. F., & Jiatong, W. (2024). *Leadership styles, team innovative behavior, and new green product development performance*. *Management Decision, 62*(10), 3208–3234.

Lovell, M. (2024). *The impact of innovative leadership on the future of higher education*. Class. https://www.class.com/blog/impact-of-innovative-leadership-on-the-future-of-higher-education/

Mountbatten-O'Malley, E., & Morris, T. H. (2025). *Self-directed flourishing: A conceptual meta-framework for dealing with the challenges of 21st-century learning and education*. *Quality Education for All, 2*(1), 171–189.

OECD. (2023). *Innovating education and educating for innovation: The power of digital technologies and skills*. OECD Publishing.

Phakamach, P. (2023). *Educational innovation: Elements and mechanisms for the development of Thai educational institutions towards internationalization*. *Journal of Education and Innovative Learning, 3*(2), 161–180.

Phakamach, P., Panjarattanakorn, D., & Onsampant, S. (2023). *Conceptualization and development of digital leadership to drive corporate digital transformation for sustainable success*. *International Journal of Educational Communications and Technology, 3*(2), 27–39.

Phakamach, P., Senarith, P., & Wachirawongpaisarn, S. (2022). *The metaverse in education: The future of immersive teaching & learning*. *RICE Journal of Creative Entrepreneurship and Management, 3*(2), 75–88.

Robert, N. L., & Christopher, F. A. (2010). *Effective leadership* (4th ed.). Thomson South-Western.

Serdyukov, P. (2017). *Innovation in education: What works, what doesn't, and what to do about it?* *Journal of Research in Innovative Teaching & Learning, 10*(1), 4–33.

Sheninger, E. (2014). *Digital leadership: Changing paradigms for changing times*. Corwin.

Sousa, M. J., & Rocha, A. (2019). *Leadership styles and skill developed through game-based learning*. *Journal of Business Research, 94*, 360–366.

Sutiyatno, S., Santoso, K. I., & Susilo, G. (2022). *The role of innovation leadership in teacher commitment: A study of organizational culture. International Journal of Educational Methodology, 8*(3), 595–607.

Tran Pham, T. K., & Nguyen Le, T. Q. H. T. (2024). *Impacts of ethical leadership, innovative climate on project success: The role of innovative behavior and time pressure. Baltic Journal of Management, 19*(1), 19–35.

Vandavasi, R. K. K., McConville, D. C., Uen, J.-F., & Yepuru, P. (2020). *Knowledge sharing, shared leadership and innovative behaviour: A cross-level analysis. International Journal of Manpower, 41*(8), 1221–1233.

Zheng, J., Wu, G., Xie, H., & Li, H. (2019). *Leadership, organizational culture, and innovative behavior in construction projects: The perspective of behavior-value congruence. International Journal of Managing Projects in Business, 12*(4), 888–918.