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ISLAMIC LECTURER LEARNING LEADERSHIP MODELS IN THE DIGITAL ERA AND THEIR IMPLICATIONS FOR STUDENTS' PROBLEM-SOLVING SKILLS

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ABSTRACT

The present digital era urges leadership capacity to anticipate the challenges of the times. Leadership strength is encouraging lecturers, educational personnel, and students to develop all their potential through motivation, inspiration, cooperation, and all resources to achieve goals. Meeting these goals through leadership is made possible by the current demographic bonus of the Indonesian nation, where the superior competitiveness of human resources will be the key to the nation's progress and competitiveness. The success of the learning process and the enhancement of students' problem-solving skills greatly depend on the lecturer's learning leadership model. This mixed-methods study aimed to analyse the impact of a lecturer's learning leadership model on students' problem-solving skills at UIN Walisongo Semarang. The present research examined the human dimensions of the Industrial Revolution 4.0 by analysing leadership theories that focused on investigating the specific behaviour of leaders and their influences as the determinant of leadership success. Using a pre-test and post-test design, the research collected data from students in both experimental and control classes. The findings showed a significant improvement in problem-solving skills. The experimental class's mean score increased from 67.40 in the pre-test to 73.71 in the post-test, while the control class's mean score only slightly increased from 64.94 to 69.40. These results indicate that the learning leadership model effectively enhances students' problem-solving abilities.

KEYWORDS: Learning Leadership, Digital Era, Higher Education, Problem-Solving Skills

1. INTRODUCTION

As an educational institution, UIN Walisongo Semarang is committed to improving higher education services, ensuring the implementation of quality higher education based on the unity of sciences, and making breakthroughs in carrying out its role and function as a provider of professional human resources in each field. The mushrooming number of universities has the potential to reduce quality because quality standardisation, as regulated in existing regulations, is not the priority; instead, the trend towards more commercialisation of education means that the quality of education for students is often ignored. (Naidoo, 2017; Tapung, 2024).

Today, Industry 4.0 is bringing about significant social, economic, political, and technological changes that can have a long-term impact. Internet access is one of the products of this industrial era. (Popkova et al., 2019; Suzano, 2024; Mendoza-Del Villar et al., 2020). The development of Industry 4.0 is a challenge for managers of higher education institutions in Indonesia. This rapid development encourages leadership in the higher education sector to adapt and develop quickly, while simultaneously making Industry 4.0 a great opportunity and challenge for the globalisation of education. (Siau et al., 2019; Antunes et al., 2018; Mahalli & Haryanto, 2021).

Leaders can affect others by motivating, informing, inspiring, showing technical skill, communicating well, and sharing a vision. People use leadership to help others reach their goals. In this scenario, teachers need to be able to help their students learn properly. (Houchens & Keedy, 2009; Baştea & Catalano, 2023; Mulyadi, 2021). Leadership is equal, which means it is a sign of ambition, the desire of someone honest, with integrity, self-confidence, intelligence, and deep technical knowledge, responsible for reaching their purpose and vision. It involves how a person or organisation motivates and changes people's conduct to get what they want, like graduating great students. (Rony et al., 2023; Leithwood, 2004; Robbins & Judge, 2024).

College graduates must be visionary, highly creative, develop innovative and quality leadership strategies, be responsive to progress, and anticipate the demands of changing times (Fathih et al., 2021; Mupa, 2017; Kadhum et al., 2023). To remain competitive and face the Industry 4.0 era, university students need to master various important skills, such as critical thinking, problem-solving, digitalisation skills, and adaptability. The students must have critical thinking skills, creativity, innovation, communication skills, the ability to work together, build, and high self-confidence. Industry 4.0 is hoped to improve the world (Stanikzai, 2023; Liu et al., 2025; Bhatti & Alqasa, 2025).

Some researchers have conducted several investigations on the leadership models. Latifah & Asy'ari (2024) analyze and describe the role of female leadership in developing Islamic education management. The results of the research show that female leadership in Islamic education has a significant impact on improving the quality of madrasahs. Female school principals apply discipline, professionalism, and good communication to improve teacher performance and the quality of education, despite challenges such as limited budgets. Asrul (2014) investigated a topic on 'Female Lecturer Learning Leadership' regarding the problem of the aspect of lecturer learning leadership for women at the University of North Sumatra. The result showed that the lecturer's leadership plays an important role in building student character, where lecturers do not only teach learning materials. Azman et al. (2024) conducted an investigation on 'The Role of Women's Leadership in the Development of Islamic Education Management'. The result showed that the reformulation is essential to meet the needs of an evolving society and fulfill the mission of Islamic education in a rapidly changing world. Kusdibyo (2021) investigated 'Leadership and Performance of Lecturers in Improving the Quality of Education at Maritime Universities'. The research results indicated a positive and significant contribution and influence of leadership and lecturer performance on the quality of education. Previous research concerns lecturer leadership, focusing on the leadership process. However, this research focuses on Lecturer learning leadership in the digital era and post-COVID-19 pandemic and on 21st-century core skills, namely problem-solving (creative, innovative, and communicative).

Unfortunately, Indonesian society is not yet in line with the development of Industry 4.0. Here, the people have different achievements at different stages of development. Some are still at a primitive stage, agrarian and industrial society, and some have entered the digital era (Ingraham & Getha-Taylor, 2004; Ellitan, 2020; Kumar & Gupta, 2020). These types of societies do not grow linearly, but in parallel. In addition, even though the digital era has been mushrooming, indicated by the increasingly widespread Internet of Things (IoT), groups of people still cannot access the internet and are in blank spots. This uneven situation surely affects the development of education in terms of the character of lecturers and students (Owen & Demb, 2004;

Hardyanthi et al., 2016; Haryanto, 2024). Therefore, it is necessary to adjust teaching methods by strengthening the leadership role of lecturers in creating innovation and creativity among students. Based on the previously mentioned background, the present research examined the human dimensions of the Industrial Revolution 4.0 by analyzing leadership theories that focused on investigating the specific behavior of leaders. Its urgency was because leadership behavior predicts the level of Influence and is the best determinant of leadership success.

2. METHODOLOGY

This research employed a mixed-methods approach, beginning with a qualitative study and conducting quantitative research. (Ary et al., 2010). The study was conducted at UIN Walisongo Semarang, utilising students, lecturers, staff, and the executive board as data sources. In the meantime, the participants chosen for benchmarking included male and female students. The sampling procedure refers to stratified proportional purposive random sampling. Students are divided into two groups, namely general (Science and Technology study programs) and religious (religious and humanities study programs). Stratification is arranged based on year and semester (8, 6, 4, and 2). Respondents' determination is arranged randomly based on a lottery for the experimental and control classes. The research instruments include: 1) questionnaires in the form of: (a) internal validity tests through experts and theories, and external tests, validity tests based on SPSS version 26 data processing), (b) reliability tests based on SPSS and WStar; 2) interviews and observations as well as FGDs based on interview, observation and FGD (Focus Group Discussion) guidelines that experts in digital era learning leadership have validated. The data were gathered through questionnaires, observations, interviews, and documentation.

Following the current data collection process, they were then processed and analysed using descriptive, qualitative, and quantitative methods. (Miles & Huberman, 1994). The researchers conducted interviews and analysed information from management, lecturers, and students at UIN Walisongo Semarang. This included evaluating the results of the treatment through the administration of a pre-test and post-test.

3. RESULT

Based on the distributed questionnaire, the mean of pre-test and post-test of the subjects' solving skills is presented in Table 1 below.

Table 1: Problem-Solving Skills.

Score	Problem-Solving Skills			
	Pre-test		Post-test	
	Experimental Class	Control Class	Experimental Class	Control Class
Highest	93	86	93	93
Lowest	46	49	56	58
Mean	67.40	64.94	73.71	69.40

Table 1 presents students' problem-solving skills scores in the pre-test and post-test. The experimental class achieved a highest pre-test score of 93, a lowest score of 46, and a mean of 67.40. In contrast, the control class recorded a highest score of 86, a lowest score of 49, and a mean of 64.94. After implementing the Basic Counselling Skill Training model utilising the Cycle Learning Method, the experimental class achieved a maximum score of 93, a minimum score of 56, and an average of 73.71. The control class achieved a maximum score of 93 and a minimum score of 58, resulting in a mean score of 69.40. Both classes exhibited notable differences.

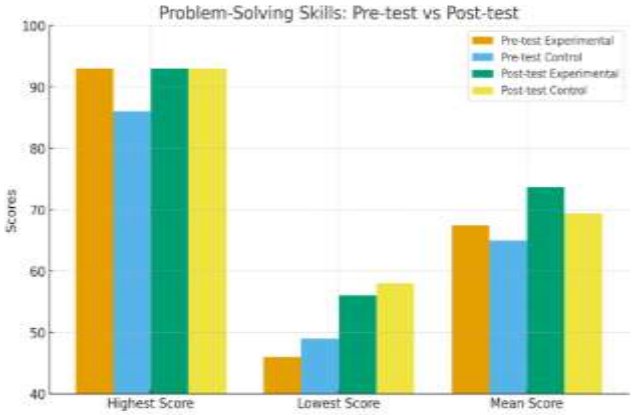

Figure 1: Problem-Solving Skills.

The differences in the pre-test and post-test results are shown in the chart below.

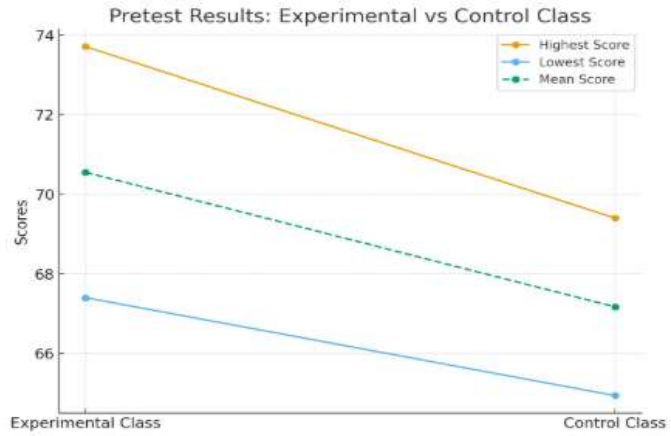

Figure 2: The Differences In The Pre-Test And Post-Test Results.

Based on Table Figure 1, the pretest results for the experimental class obtained the highest score of 73,71, with the lowest score of 67,4 and a mean of 70.55, while the control class obtained the highest score of 69,4, with the lowest score of 64,94 and a mean of 67,17.

Table 2: The Results of the N-Gain Test of Problem-Solving Skills.

N-Gain	Experimental	Control
	3.76115	2.89239

In the experimental class that used the Cycle Learning method, the increase in problem solving skills was 3.86115 compared to the control class that used the FGD method, which was only 2.89239.

4. DISCUSSION

Over the past few years, higher education in Indonesia has experienced a paradigm shift. It involves changes in mechanisms for managing competition triggered by the very active development of the external environment related to advances in information technology, so that e-learning, online colleges, and the like began to be widely researched and designed. The digitalisation in governance and management patterns also affected the organisation and activities in higher education. Universities not only perform as the centres of knowledge, research, or non-profit, but also as knowledge-creating entities that must compete for existence. Universities as non-profit organisations also compete in fees, quality, and service (Warta, 2023).

Lecturers are significant in facilitating learning and enhancing students' success in attaining optimal learning outcomes. Their functions and roles are crucial in facilitating student innovation in the learning process, particularly in the context of the fourth industrial revolution. Lecturer leadership influences, guides, and directs students' learning processes. A lecturer guides the class in formulating and attaining learning objectives. The leading actor significantly influences the success of the learning process in higher education. A lecturer is an educator, designer, and curator of learning materials, sources, and media. He serves as his students' central figure and role model (Azisah, 2014). In conclusion, a lecturer's leadership ability facilitates student learning success.

4.1. Creating A Product Environment

To create a productive environment for digital era students at Indonesian universities, lecturers need to execute the following things: 1) Use technology in the learning process. This can be done using online learning platforms, mobile applications, or modern learning software. 2) Encourage open and interactive discussions. Students of the digital era tend to be more comfortable discussing and interacting via digital platforms such as online forums and social media. Hence, lecturers need to use this to facilitate productive discussions. 3) Provide consistent and structured feedback. In the digital era, students expect fast and structured feedback on every assignment or project they work on, so lecturers need to provide this to foster student motivation and involvement. 4) Encourage collaboration between students. Student collaboration can be done more easily in the digital era by utilising digital platforms such as cloud services or collaborative applications. 5) Establish open communication with students. Lecturers need to avoid creating distance with students. By establishing open communication, whether via email, social media, or other online platforms, it will be easier for lecturers to understand students' challenges and needs.

Lecturers need to develop productivity strategies in the classroom to optimise teaching effectiveness. They may utilise technology such as laptops, projectors, and other multimedia to enhance presentation quality and save preparation time. Besides, e-learning platforms can be alternatives for giving and collecting assignments and providing feedback. Another strategy is for lecturers to optimise the time available in class by creating a clear and structured schedule. Discussing additional topics or providing guidance to students who need help is possible in free time. According to Sato (2012), lecturers can encourage students to collaborate in completing assignments or making presentations. In this way, students can learn from each other and help each other understand the materials.

Productivity tactics employed by university lecturers in Indonesia throughout the digital era can enhance teaching efficacy and enrich students' learning experiences. To enhance the efficacy of the classroom environment in the digital age, colleges must persist in advancing and advocating for technology infrastructure while bolstering the engagement of both lecturers and students. Therefore, holistic learning methodologies like blended learning should gain popularity and be more extensively adopted in Indonesian universities.

4.2. Stages In Creating A Productive Learning Environment

Higher education institutions must apply information and communication technology to enhance learning efficiency and effectiveness. With

technology, learning can be done online, making it easier for students to access information and increasing connections between students and lecturers. Learning facilities are important in creating a productive learning environment. Universities must provide adequate learning facilities to support academic activities, such as comfortable classrooms, complete libraries with digital access, laboratories, and studios for practice. By doing so, collaboration between students and lecturers can be done to improve the quality of education. Universities must encourage collaboration between students and lecturers by holding discussions, seminars, workshops, and other activities.

A curriculum aligned with market demands must be established to adequately prepare students for professional careers. It should encompass the competencies required in the workforce and the technologies employed in industry, and it should enhance students' interpersonal skills, including communication and management abilities. Universities must offer exemplary academic guidance to facilitate students' academic success. Academic support should be delivered by qualified instructors capable of addressing the educational challenges encountered by pupils. By executing these measures, Indonesian institutions can establish a conducive learning environment that enhances educational quality and equips students for professional readiness in the digital age.

Universities in Indonesia need to prepare themselves to face the rapidly developing digital era. A crucial thing that needs to be done is to create optimal learning conditions for students. The following are some concrete plans for creating optimal learning conditions in college: 1) Increase internet access throughout campus so that students can access information and learning resources easily. 2) Expand the reach of online learning for students who cannot attend class physically, for example, by providing lecture recordings. 3) Encourage the use of technology in classroom learning, such as interactive learning applications and learning management systems. 4) Provide adequate and comfortable learning facilities, such as good classrooms, adequate libraries, and complete computer labs. 5) Encourage the development of digital skills in students through the curriculum and extracurricular activities.

The application of technology and innovative teaching methods is significant in supporting the quality of Indonesian higher education. In this case, using information and communication technology (ICT) is a key factor in increasing the effectiveness of the learning process on campuses throughout Indonesia (Sadikin, A., & Hakim, N., 2019). This technology can be applied through e-learning, virtual classrooms, e-libraries, video conferencing, and other educational applications. In this way, students can easily access learning materials anytime and anywhere, and get more interactive and engaging explanations from lecturers. In addition, innovative teaching methods also need to be considered. These methods can help students understand the material and develop their abilities in college. Some examples of the methods include Cooperative Learning, Problem-based Learning, and Project-based Learning.

In this instance, educators must also innovate and enhance their pedagogical skills to achieve superior and more effective learning outcomes. Implementing technology and new pedagogical approaches in Indonesian higher education throughout the digital era is crucial for enhancing the quality of education in Indonesia.

4.3. Communication And Implementation Of Campus Vision

Effective communication among institutions, students, teachers, and the rectorate is crucial for enhancing the quality of higher education. Furthermore, integrating technology and digital media in educational practices and campus administration is essential for adapting to contemporary advancements.

Moreover, the execution of the campus vision is a significant determinant of success in higher education during the digital age. A distinct and quantifiable vision will assist institutions in establishing the trajectory and emphasis of future advancement. The integration of technology and innovation in realising the campus vision must persist to address the requirements of students and society in this digital age. Consequently, colleges must enhance communication and the execution of the campus vision to address difficulties in the digital age effectively. The calibre of education and the reputation of Indonesian higher education will be enhanced if this initiative advances successfully.

Higher education institutions in Indonesia must also be consistent in communicating their visions. Consistent vision communication includes communicating the university's missions, vision, values, and goals. All parties in higher education must understand and follow the vision, missions, values, and goals to make relevant decisions. Consistent communication of the campus vision can be realised through various digital platforms, such as websites, social media, and email. Digital platforms

must be communicated consistently and coordinated to convey the message well to the target audience. This consistent communication is expected to enhance the image of universities and enable them to compete with other domestic and foreign universities.

Integrating the campus vision into every aspect of learning is crucial to ensuring students' readiness to face an increasingly complex future. This vision must be effectively socialised to lecturers and teaching staff so that those personnel can integrate these values into their curriculum. More effective use of information and communication technology (ICT) can also facilitate the integration of the campus vision in every aspect of learning.

The campus vision can be integrated by developing learning programs encouraging active student involvement in creative and innovative activities. Meanwhile, using supporting resources such as study rooms, laboratories, and technological facilities can also help strengthen the integration of the campus vision. These efforts must continue to be developed and improved to ensure better quality education relevant to the times.

4.4. Socialisation And Implementation Of The Campus/University Vision

Universities in Indonesia must continue socialising and implementing their vision to compete with universities in other countries. Socialising the vision of a campus/university in the digital era can be done in various ways, such as: 1) Create an informative and easily accessible website for the wider community. 2) Hold seminars and discussions about the campus/university vision. 3) Increase publication and promotional activities via social media. Meanwhile, implementing the campus/university vision can be done by: 1) Integrating information and communication technology in the learning and research process on campus/university. 2) Develop a curriculum that meets the demands of the digital era. 3) Carry out research and development following the vision of the campus/university.

The campus vision urgently requires the involvement of all parties in higher education, including students, lecturers, administrative staff, and campus leaders, in socialising and integrating. A holistic and structured approach can effectively instill and implement the campus vision in today's digital era. The campus vision, which focuses on developing technology-based learning, will help universities in Indonesia adapt to the increasingly digital era, help students develop digital skills, and prepare them for global competition.

4.5. Leader Involvement In College Management

The college executive board or leader is very significant in college management. People in this job need to make wise choices that will improve higher education for teachers and students. They also need to come up with new and fascinating ways to teach that will satisfy the needs of today's kids. To do this, these personnel must work with teachers and technology specialists to ensure technology is used in learning.

Higher education leaders must also ensure that college management is executed efficiently and effectively. They can use an integrated learning management system to monitor student progress and improve teaching staff performance. In addition, quick adaptation and strategies update according to technological developments are urged to be done by them. By actively involving themselves in college management, the leaders can secure the relevance of their campus in the digital era. Leadership is directed at increasing student achievement, supported by curriculum development and investment for higher education development (Asuga et. al, 2015). The right learning leadership model must be inclusive, collaborative, and student-oriented. This model must facilitate students' involvement in the learning process as colleagues and partners in improving the quality of learning.

Some possible patterns or models of lecturer learning leadership that can be applied in the digital era are: 1) Technology-based learning patterns, 2) Experiential learning, 3) Project-based learning patterns, 4) collaborative learning, and 5) Discussion-based learning. In implementing this model, lecturers must be particular that the model follows student needs and characteristics. Also, they must actively guide students and be involved in the learning process to ensure effective and efficient student learning (Bashori, 2020).

The relationship between lecturers and their students exemplifies a broader concept of leadership. A lecturer must assume a leadership role in the classroom to effectively create and implement the mission and vision to be achieved. Research by Fajri et al. (2019) concludes that learning achievement can be enhanced through the leadership of rectors and lecturers. Laux et al. (2007) found that students enhance their social skills and self-regulation through experientially-based counselling training programs. This is consistent with the findings of Agustiana (2011), Darmiany (2011), and Nugraha (2012). Knecht and Sabres (2013) conducted research

indicating that students report feeling prepared for clinical practice following their involvement in an experiential learning program in occupational therapy. Research conducted by Purnami, RS, & Rohayati (2013) demonstrated that implementing experiential learning programs effectively enhances student soft skills. Usmawati & Hanurawan (2014) demonstrate in their research that the experiential learning model significantly enhances multicultural awareness among students in multicultural groups, specifically among Ethnic Javanese and Chinese individuals.

Based on previous research, lecturer-led learning can help students develop problem-solving skills. However, the findings are not separate from the effects of the learning leadership technique used by the lecturer. Lecturers who use learning leadership tactics to teach are focused on their own experiences of helping students become more conscious and engaged in strengthening their problem-solving skills.

Students' responses following the implementation of lecturer learning leadership strategies showed positive responses to environmental problems and the ability to solve problems with their understanding. Students started to feel concerned about society's social situation in society, which is increasingly changing for the worse. To solve society's social problems, students wished to contribute by conducting outreach.

The variable representing problem-solving skills exhibited a notable increase in value. 0.016 With a significance level of α = 0.05, the significance value obtained was 0.016, less than 0.05. This indicates the rejection of the null hypothesis (H0) in favour of the alternative hypothesis (H1), suggesting a difference in the problem-solving skills of students who participated in learning through lecturer learning leadership patterns compared to those who did not. Consequently, these learning patterns influenced students' problem-solving abilities.

The mean presented in Table 1 evidences the Influence of lecturers' learning leadership patterns on problem-solving skills. The mean for the experimental class was 67.40, in contrast to 64.94 for the control class, as indicated in Table 1. Following treatment, a noticeable difference was observed. The results are presented in Table 1, indicating that the mean posttest score for the experimental class was 73.71, while the control class had an average of 69.40.

The N-Gain test results corroborate the aforementioned data descriptions. Table 2 presents the extent of change in collaboration skills scores. The experimental class exhibited a score change of 37.8%, classified as medium, whereas the control class demonstrated a change of 8.75%, classified as low. Lecturers' learning leadership patterns significantly impact problem-solving skills.

The observed difference resulted from the treatment administered to the experimental class, which influences learners' problem-solving abilities through learning syntax. The learning control class utilised a teacher-oriented model, which may have diminished its impact on problem-solving skills, as the focus was primarily on attentive listening to the lecture.

The lecturer's learning leadership model can be helpful because it includes experiences that help people improve their problem-solving skills. Another good thing about it is that it allows pupils to see how well they can use their problem-solving talents. So, the outcomes of this study show that this teacher's model of learning leadership has helped pupils improve their problem-solving skills. Also, this strategy could assist students in reorganising the skills they already have to make the most of them.

4.6. Implication Of The Findings

Referring to the research results obtained, the findings have several implications as follows. It is hoped that the results of this study can be used as a reference for learning models, apart from being an effort to improve interpersonal communication and problem-solving skills. This Basic Counseling Skill Training Model, with Learning Leadership Models, can provide meaningful experiences because learning requires solving problems through communicating with people around, and training students to build their knowledge through real or contextual problem-solving experiences. With the application of the Basic Counseling Skill Training learning model with the Learning Leadership Models in the Digital Era and Their Implications for Students' Problem-Solving Skills provided by the lecturer, it is hoped that students will be able to solve problems with a communicative, creative, and confident attitude and have high motivation in solving problems. Research results are expected to be developed on a broader scope by using more varied variables to add insight into knowledge and improve the quality of superior human resources.

5. CONCLUSION

Based on the discussion, it is safe to say that the lecturer's learning leadership model has been used to teach students in higher Education in the digital age, notably at the Universitas Islam Negeri (UIN) Walisongo Semarang. Learning must be open to

everyone, collaborative, and student-focused when implemented. Here, students must be able to participate in the learning process as co-workers and collaborators to improve it. Tech-based learning, experiential or experience-based learning, project-based learning, collaborative learning, and discussion-based learning are some of the different types of this concept. The lecturer's learning leadership model is a great way to assist students in improving their problem-solving skills and ensure they are used effectively. The implications of the study results have impacted improving the students' communication skills and digital literacy, which are needed in the 21st century for successful students.

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