Principal's Leadership of School in Empowering Computer-Based Teachers at SD Surakarta

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Abstract: In the era of the Industry 5.0 revolution, learning is transformed by the digitalization of education. The background of this research is the very rapid development of computing in education, which requires the use of educational software and human resources (SDM). This involvement will have an impact on students in learning at Madrasah Tsanawiyah Surakarta. Qualitative research methods were used with a case study approach by subject research teachers and students of the Seventh Grade Madrasah Tsanawiyah Surakarta. Data collection techniques include documentation, observations, and interviews. Analysis techniques using triangulation of sources, methods, and techniques. Research results show that students are involved through technology in digital classroom collaboration by creating teaching materials using applications, viewing students on computer screens, and making computational-based questions. Implementation of digital use to maintain teachers currently has not been collaborative. Teacher understanding with discussions, workshops using innovative LCD learning processes with facilities, Flip Books, and one-month workshop positions inside the school. The researchers' findings show that the use of digital media is very helpful in developing student understanding; students are more actively following learning as well. Contributing to teachers' creation of Flip Books as a learning module.

**Keywords*:* Digitalization, Era of Industrial Revolution 5.0, Transformational Leadership

A. Introduction

Industrial Revolution 5.0 era accompanied the development of increasingly sophisticated technology, education experienced a significant paradigm shift. Teachers are faced with demands to integrate digital technology into the learning process (Dudin, Latip, & Supriatna, 2023; S. Rahayu, 2023; Sugiarto & Suhono, 2023). Therefore, it is necessary to understand the extent to which the application of this technology can influence student learning outcomes, student engagement, and understanding of concepts. report for subject educators and guidance and counselling instructors considering the Google structure which produces information in a note structure

(google docs) which can be used as evidence and can be printed if necessary (Hafid & Barnoto, 2022).

The computing era, which is often referred to as the Digital Age or Information Age, has had a significant impact on various aspects of social, economic and educational life (S. T. Rahayu, 2023; Rizky, 2022). The world of education will develop if it uses an independent learning curriculum (Deli, Allo, Sudarsi, Taula, & Rum, 2023). This is important to discuss to measure the extent to which a leader is in the process of developing digitalization within the institution (Lasaiba & Arfa, 2023). Technology enables fast and easy communication around the world via the internet, cell phones, and social media. So, the technological era supports the development of online learning, including online courses, electronic learning platforms, and digital educational resources. The development of learning by making learning innovations is important for an educator (S. Siregar, Faridah, & Hasibuan, 2023).

The use of technology in education can provide wider access to information and educational resources. However, it still needs to be investigated to what extent teachers use and integrate digital technology into their teaching strategies, as well as how this impacts students' conceptual understanding (Nur, Swara, Tugiman, Farida, & Utami, 2023)(Virzha, Utama, Cahyani, & Kurniawan, 2023). One of the contradictions that really hinders the modernization of education is the gap between the speed of digitalization of educational resources and the speed of digitalization of the educational process itself, which is still very low (Chappell, Sherman, & Barnett, 2018)Different from research (Ilyas, Ismail, Zulfidar, Syarfuni, & Masrizal, 2022) the transformation and management of Islamic boarding schools is going well for two reasons. Character, leadership, and respect are both qualities that can be found in a person.

Digitalization can create a more interesting and interactive learning experience. However, questions arise about the extent to which students are engaged in learning when technology is used, and whether the use of technology is able to increase students' motivation to learn. With gamification to encourage knowledge retention using an action research approach (Forsetlund et al., 2021)using zoom meet, google meet and google class media as the media used is not easy for students to understand the material being taught.

It is important to understand that teachers' use of technology has a positive impact on student learning outcomes. Technology can improve students' understanding of concepts, skills and critical thinking abilities. In the context of the Industrial Revolution 5.0, evaluation of learning outcomes is crucial to ensure the relevance of education to future needs (Suraijiah, Rusdiana, Rusdiah, Ramli, & Murdan, 2023)(S. Siregar et al., 2023). The digital classroom learning management of SMPN 1 Kedungpring which is based on Google workspace is complete and in accordance with the government curriculum structure which is good for curriculum development based on educational

unit levels and the use of application features that support the learning and teaching process (Chappell et al., 2018)

The Industrial Revolution 5.0 brings major changes in the competency demands required by society and industry. Therefore, it is necessary to explore the extent to which students understand concepts related to learning materials that are integrated with technology, as well as their relevance to the demands of life and work in that era.

In implementing digitalization, teachers may face challenges such as lack of technological skills, limited access to infrastructure, and paradigm shifts in the teaching process. School leaders understand digitalization and the computerized competencies needed to lead digitalization in Swedish schools (Evawati & Susilowati, 2023; Håkansson Lindqvist & Pettersson, 2019; Pramesworo, Sembiring, Sarip, Lolang, & Fathurrochman, 2023). The digitalization methodology was implemented in elementary schools in Baraka Regency and illustrates the extent to which the digitalization game plan helps homeroom teachers in building recognition of the preparation and strategies used in this assessment which are emotional with a logical exam approach (Hastowo & Abduh, 2021)The teachers felt directly the impact of exploring two components of the digitalization training approach, namely digitalization of correspondence and learning. public school strategies and the ability to pursue a degree directly from a public authority (Anita & Astuti, 2022)

Meanwhile, research can identify opportunities and answers to increase the effectiveness of the use of innovation. So that education is better able to adapt to technological advances and societal needs, it is hoped that research findings can make a real contribution to the creation of curricula and teaching methods in the era of the Industrial Revolution 5.0. Factors such as the quality of teachers, a conducive learning environment, parental support, and the availability of facilities and resources influence the quality of education in elementary schools (Sudarsono et al., 2024). The role of the principal is expected to provide direction and support to teachers in carrying out their duties, create a conducive learning environment, manage resources effectively, and facilitate parent participation in the education process (Hallinger, 2019).

The aim of this research is to determine the use of digitalization by teachers in improving the learning outcomes of students at the Tsanawiyah Surakarta madrasah. This research focuses on innovations carried out by teachers for students so that they are carried out well and the results will provide results. Furthermore, in this article, the learning media used by teachers in the learning process provides understanding and improvement of learning outcomes (Sholichah, Alam, Dendi, & Sastradiharja, 2023). Considering the low ability of educators in digital skills. This research aims to analyze the implementation of learning using learning outcomes by analyzing children's understanding and creativity, with a special focus on innovation in the field of Islamic education, in the context of the digital era.

Barrier elements include not having a place with the offices and foundations of inclusive Islamic schools, a lack of parental understanding of the school's guidelines on Islamic life experiences, and the impact of young children outside of school live-in (Rahayuningsih, Setiawan, Warisno, Andari, & Anshori, 2023)The big impact of the ability of educators and academic supervision either part or all of the time on school survival in Driving Schools (Samari, Kristiawan, & Fitria, 2023).

Family leader because she can effectively manage household affairs, raise and educate family members, and offer advice to her husband as part of her role as a family educator (Ma'rifah, Arifin, Syarief, & Pranogyo, 2023) Moderate instructor authority techniques in working with change and development in school are directed studios for educators of all subjects, and central execution in dynamic instructor-led assessments each week. (Susanti, Prayitno, Haryanto, & Muhibbin, 2023).

Research findings educators' job accomplishments can be enhanced by advancing innovative positions of principal authority and enhancing authoritative views of justice in schools. In this examination, strengthening recommendations in the presence of markers of innovative administration and authoritarian equity can obtain non-public school techniques and activities aimed at further developing educators' work achievements (Hidayat, Patras, Marini, Sarifah, & Nurjannah, 2023).

Educational leadership is considered the most important requirement. Research findings educators' job accomplishments can be enhanced by advancing innovative positions of principal authority and enhancing authoritative views of justice in schools. In this examination, strengthening recommendations in the presence of markers of innovative administration and authoritarian equity can obtain non-public school techniques and activities aimed at further developing educators' job accomplishments (Thayib & Hamid, 2022)The Islamic boarding school model of change is analyzed, involving subjective examination, in this review. Substantial information shows that pesantren as an Islamic establishment has developed, with a large number of options that add to the production of the basic quality of Pesantres as the soul and culture of Indonesia. The results reveal that Islamic boarding schools, as Islamic educational institutions, are considered to be developing and suitable to compete regardless of the need for school change (Ilyas et al., 2022).

B. Methods

The research method used is qualitative with a case study approach (Murdiyanto, 2020)Researchers in the field need to know directly the activities of teachers and students regarding the digitization of teaching materials so that the maximum amount of information is repeated.

The subject of the research is the head of the school, teachers, and students. By asking questions about the applications used and how capable students are to understand

the implementation of learning based on digitization, as well as student learning results used as evaluation material in the world of education. The source is someone who provides information such as projects, events, exercises, and so on to obtain in-depth information or data about them (Fadli, 2021)

Data collection techniques Researchers conduct interviews with teachers about the innovation of learning applications carried out, followed by observations when using computers in depth. After that, gather documentation of the production of the teaching material and its results. It's done in depth until the researchers get the most information. Miles and Huberman (1992:20) stated that, using data reduction by collecting raw data through coding, data presentation presents data collection that gives an opportunity to reach conclusions and take action and concludes by analyzing and explaining research assumptions about research results (Sugiyono, 2022).

Data validation techniques involve triangulation of sources by comparing several sources to check validity. By using computer-based documentation of teaching materials. As well as observing students' understanding.

C. Results and Discussion

Student Engagement Through Technology with Digital Classrooms

Learning creativity is an innovative approach to the learning process. Examples include project-based learning, art, play, technology, collaboration, outdoor, inquiry-based, story, discovery, and design. Researchers want to know the learning innovations with computational design carried out by teachers for students.

"Our teachers collaborate by creating teaching materials using PPT and viewing them on the computer screen by students . In addition, they carry out evaluations based on questions that will be given by students via computer media."

Interviews with school principals explained that collaboration involves creating teaching materials using applications and viewing them on computer screens and creating computing-based questions.

Implementation of Digital Use

A simple form of animation consisting of a series of sequential images that move quickly to give the impression of movement. The term "flipbook" comes from the traditional way of making them, namely by rolling a series of pictures on different sides at a corner, then quickly rolling them with your finger so that the pictures change as if they are moving. Interviews with students show that our mission has been well achieved, increasing appreciation and observation of Islamic teachings, carrying out learning and guidance effectively, creatively and innovatively using behavior.

Application that makes it easy for users to convert standard PDF documents into attractive and interactive digital publications such as e-books, magazines, brochures, and so on. This application allows users to create visually attractive multimedia content by animating computerized stages that can support the realization of internet, sound, video, gallery images, interactive buttons, etc. elaborating on the concept of digitalization and how schools face digital and educational changes. In this analysis, it appears that digitalization objects have ideas that influence how digitalization is planned and implemented in school organizations (Pettersson, 2021).

Interviews with teachers explained that to use Microsoft in learning activities the learning methods used in computer-based or digital learning, as well as utilizing the modules used were supplemented with applications provided on the internet for teacher empowerment programs. As a result , the advanced stages, WhatsApp Meeting, Google Office (Google Homeroom, Google Structure, Google Meet), and Zoom Cloud Gathering, are often used (Assidiqi & Sumarni, 2020). The research conducted (Hanifah Salsabila et al., 2019) aims to show how Google Classroom, YouTube, WAG, Edmodo, Zoom, and Googlemeet are boldly used for teaching during the Covid-19 pandemic which is spreading throughout the world, especially to Indonesia.

"You can then practice the discussion method, but it can also be seen or adjusted to suit your needs."

Interviews with students explained that the methods used were discussions and practices that were adapted to students' needs. The conclusion was that Microsoft in learning activities used learning methods in computer-based or digital learning, as well as utilizing the modules used plus applications. Information and Communication Technology (ICT) is positively related to economic growth in both groups of countries (Habibi & Zabardast, 2020). The methods used are discussion and practice adapted to student needs. Technical guidance for elementary school (SD) teachers on how to utilize ICT, develop it through independent learning with YouTube, create products with Google Sites, and use it in class to learn information that is classified as very interactive and aims to increase one's insight and existence. Utilization of site-based school innovation data can be obtained anywhere and at any time via the web network (Habibah, 2022). Supported with Professional PDF flip application:

Figure 1. **Flip Books**

The Filp Books module contains learning materials on science in IPA learning, namely measurement, reporting, and experiments and exercises. The materials are organized using digital applications that make it easy for students to learn.

A software used in a Learning Management System (LMS) to present learning material in the form of modules or interactive digital content. This e-Module aims to build proficiency and continuity of teaching and developing experience , by utilizing digital technology. The use of artificial intelligence in the classroom is first on computer hardware and software, then in the form of the web and online learning platforms (Manongga, Rahardja, Sembiring, Lutfiani, & Yadila, 2022). Data innovation media is said to be very intuitive and is expected to build knowledge and personal presence (Fitria et al., 2021).

The electronic module (E-Module) is based on project-based learning and is integrated with hyperchem computing media on molecular materials (A. D. Siregar & Harahap, 2020). Supported by the following E-Module creation table:

Table 1. E-Module Creation

No	Stages	Information
1	Preparation of E-Modules	√
2	E-Module Collection	√
3	Semester E-Module Collection	√
4	Review and Revision	√
5	Final E-Module Submission	√
6	Share E-Modules	√
7	Effective KBM (Welcome to start preparing for Semester 2 E-Module)	√

Understanding Through Discussions, Workshops

Teacher and employee workshops are activities aimed at providing training, learning, or improving skills to teachers and employees in an organization or institution. The application of website-based school technology information can be accessed anywhere and at any time via the internet network. Furthermore, procedures reflecting the level

of digitalization of the system (high level training) were created and implemented

Interviews with school principals explained that the material was in accordance with the workshop program being held, for example religious material about learning innovations using LCDs, the facilities we provided were LCDs and the materials were in accordance with student learning. Teachers are given training on how to use LCDs and innovative learning processes with these facilities. ICT skills can be achieved by participating in socialization, preparation, renovation, courses and studios regarding ICT (Astini, 2019). Empowering teachers at Kepanjen State Vocational School always includes the principal's assistance in increasing knowledge, updating a teacher to understand teaching developments, educating as a teacher, methods of approaching students, and improving science and technology in learning. The training succeeded in increasing teachers' understanding of computational thinking and increasing students' motivation to take part in the national computational thinking competition during that period (Suyono, Syuhada, & Sumaryanto, 2021).

Interviews with school principals once a month workshop positions within schools, muhamadiyah, independent learning curriculum, and innovative teachers. growmindset psychology training implementers are all teachers (Allen & Liou, 2018). Different from research to deal with things that will happen in the era of computerization 4.0, fast response to changes in the era 4.0, focus on cycles and results, dominance of equations (Safitri, Hermawan, Husna, & Sobri, 2022)

The material is in accordance with the workshop program being held, for example religious material about learning innovations using LCD, the facilities we provide are LCD and the material is in accordance with student learning. Teachers are given training on how to use LCDs and innovative learning processes with facilities and workshops once a month in positions within the school (Myrberg, et al., 2021). Teachers' ICT competency, a proposed training program, in the form of webinars, has been developed. This research recommends further study of teachers' ICT competencies and abilities; implementation of training impact evaluation; and a review of policy and implementation of teacher training and development locally (Marycon, Gonzalez, & Villareal, 2020).

Learning interactions in the Era of Industrial Revolution 5.0

Learning interactions are becoming more sophisticated and diverse thanks to increasingly advanced technological developments and connectivity The Industrial Revolution Era 5.0 or known as the digital transformation era. Different from research (Machekhina, 2018) the contradiction that really hinders the modernization of education is the gap between the speed of digitalization of educational resources and the speed of digitalization of the educational process itself which is still very low Facing training in the era of modern transformation 4.0, in particular: (1) First, you actually have to have the choice to adapt to these various changes in order to continue

to exist and make a real contribution to various changes, especially in the field of instructive innovation(Kurniawan, Sudirin, & Firnanda, 2024). (2) Second, as a professional, you must continue to develop your impressive skills in order to make different learning developments and appropriate progress in response to the learning problems that students will face (Aziz, 2022). To face these difficulties, various skills must continue to be mastered and created (Mursid & Yulia, 2019). Receptive to progress to face things that will happen in the era of computerization 4.0, quick response to changes in the era 4.0, focus on cycles and results, dominance of the 4C equation,, specifically: firm reasoning, creativity, correspondence, joint efforts (Wening & Santosa, 2020).

The next student's learning outcomes , the prayers used, will be returned to each teacher, each person's skin, different styles and concrete, don't take them, so the hope is that the learning (Hash, 2020). Questionnaire surveys and focus group interviews with students also showed that the pedagogical delivery of an e-Learning framework with support from computer-aided analysis of students' reflection texts coupled with hierarchical visualization of analysis results was considered positive (Kong, 2021).

Teachers who understand innovation are expected to be able to guide students to read or search for predetermined reading sources via the web or other applications. The results of searches directed by analysts show that currently SKI educators at SMPIT Raudlatul Jannah Gayo Lues have involved computer-based media in their education, but it is not yet working perfectly (Yuliana, 2021).

21st century learning is centered on a community of students who are determined to provide students with thinking skills that include: (1) decisive reasoning, (2) critical thinking, (3) metacognition, (4) conveying, (5) collaborating, (6) advancing and innovative, (7) data proficiency. Therefore, education is believed to be able to produce quality human resources in the field of innovation. The preparation program is planned to adapt to progress in the era of modern 4.0 upheaval so that educators become capable and proficient in 4.0 so that educators become skilled and proficient (Fitriyah, 2019).

D. Conclusion

Student involvement through technology with collaborative digital classes by creating teaching materials using applications and viewing them on computer screens and creating computing-based questions. Project-based learning, art, play, technology, collaboration, outdoors, inquiry-based, story, discovery, and design. The methods used are discussions and practices that are adapted to student needs. Based on the results of the interview above, it can be concluded that Microsoft in its learning activities uses computer-based or digital learning methods, and utilizes the modules used plus applications. Teacher understanding through discussions, workshop programs held, for example religious material about learning innovations using LCDs,

the facilities we provide with LCDs and materials in accordance with student learning. The results of the students' subsequent learning, the prayers used will be returned to each teacher, each person's skin, different styles and concrete, don't take them, so the hope is for learning.

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