



Change Leadership in The Development of Digital Learning Ecosystem: A Case Study at Brawijaya Smart High School

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Abstract:

Digital-based education has become one of the important elements to enhance the quality of learning in various educational institutions, especially in senior high schools. Brawijaya Smart High School Indonesia (BSS) is the subject of this study. The purpose of this study is to describe how the leaders of BSS are leading the change towards a digital learning ecosystem. The research method involves data collection through interviews, observations, and document analysis related to digital change initiatives in the school. The findings of this study reflect how leaders at BSS play a key role in designing, implementing, monitoring, and evaluating the implementation of digital education transformation. This in-depth study explores the motivators, enablers, and inhibitors of transformational leadership and the impact of change on the school's learning ecosystem. In addition, the leaders ensure that integrating digital-based technologies into the curriculum is effective, improves the quality of learning, and meets the expectations of learners and stakeholders. A qualitative approach with a case study design was used to uncover the facts in the field. Data analysis took place in three simultaneous stages, namely data reduction, data presentation, and conclusion (verification) while triangulating sources carried out data validity until the researcher found the desired certainty. This research provides an in-depth insight into how change leadership in developing digital-based learning ecosystems in BSS can positively contribute to modern education's development. The implications of this research can also help other schools to identify the best practices and develop effective leadership strategies in this current era.

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Introduction

One of the key challenges today is the rapid advancement of technology (Dufva & Dufva, 2018). On the other hand, technology offers great opportunities to improve access and quality of education, along with the rapid transformation of technology and the

development of technologies that meet the needs of diverse users (Carr'e, 2020; Scheuer et al., 2021; Van Dijk, 2020). Inequalities in access to the internet and digital devices can increase the educational divide. Therefore, strategic measures are needed to ensure technology is used inclusively in the education system (Büyükbaykal, 2015).

In addition to these global challenges, it is also important to note that the COVID-19 pandemic has brought additional challenges to achieving Sustainable Development Goals related to education in Indonesia. According to Ashraf and Cheshmehzangi et al., the COVID-19 pandemic has severely impacted society's transformation (Ashraf, 2020; Cheshmehzangi et al., 2022). In particular, the closure of schools and distance learning has made the educational process difficult, especially for more vulnerable groups. Therefore, post-pandemic restoration of education should be a top priority in Indonesia's efforts to achieve sustainable quality education.

To achieve the 2030 Sustainable Development Goals on quality education in Indonesia, special attention must be paid to eliminating inequalities in access to education, adaptation efforts related to integrating technology in learning, and post-pandemic recovery. This is an effort to achieve equitable and inclusive quality education.

The above efforts can be manifested through the availability of digital learning ecosystems in educational institutions. Digital learning ecosystems are increasingly important in this modern era, as digital technology has become integral to everyday life. Education cannot be separated from this change due to the increasing need for people (in the context of schools, educators, and learners) to use digital platforms to network and complete their responsibilities (Hu, 2015).

To prepare the young generation for a digitally connected future, digital-based learning ecosystems in schools are a necessity and a crucial aspect of the advancement of education. Therefore, this research needs to be conducted to find out how educational institutions can adapt to the challenges of the modern era, which is becoming increasingly dynamic with the development of digital technology, and whether the leadership is successful in organizing the development of a learning ecosystem that maximizes digital resources by involving all existing components.

One key aspect of a digital learning ecosystem is modern hardware, such as computers, tablets, and mobile devices, which enable learners and teachers to access information and educational resources more efficiently. On the other hand, a strong network infrastructure is key to ensuring stable and fast connectivity, enabling access to the Internet and online educational service platforms. School learning provision is expected to provide quality education and encourage active learning so that students can achieve fully. Effective learning certainly requires an integrated service from schools, such as adaptive, creative, and competent teaching resources.

Schools can also integrate digital resources, such as e-books, learning videos, and other digital platforms, to offer services to learners. In this manner, digital learning ecosystems enable more diverse learning and support individual learning styles as needed. In addition, digital learning ecosystems can improve communication between schools, teachers, learners, and parents. Schools can interact more effectively with all stakeholders through online communication tools such as email, instant messaging, and discussion forums to disseminate information, updates, and reports on learners' progress.

Overall, the digital learning ecosystem is an integral part of the transformation of modern education, opening the door to more interactive, collaborative learning and flexible access to services. However, good management and oversight are needed to ensure these technologies are used effectively and safely in education.

Method

The author is interested in investigating the application of change leadership in the context of developing a digital-based learning ecosystem, given the importance of digital literacy today as an effort to participate in supporting the fourth goal of sustainable development by the United Nations (SDG's 2030), namely the realization of quality education. Digitization in educational services is very helpful in enhancing effectiveness and efficiency, so it is assumed that it can positively impact improving the quality of education through the development of digital-based learning ecosystems. A qualitative approach with a case study design is used to uncover the facts in the field. Data analysis takes place simultaneously in three stages, namely data reduction, data presentation, and inference (verification), while data validity is achieved by triangulating sources until the desired certainty is achieved. (Moleong, 2018; Sugiyono, 2015; Ulfatin, 2015).

Results and Discussion

Results

Change Leadership

The Urgency of Implementation in Educational Institutions

Leadership reflects the assumptions about the deliberate process by which an individual exerts strong influence over others to guide, structure, and facilitate activities and relationships within a group or organization. Gibson defines leadership as an attempt to influence rather than coerce by influencing or motivating individuals to achieve goals. Thus, the definition of leadership is the ability to influence a group toward the achievement of goals and can also be formulated as the process of affecting the activities of a person or group to achieve goals in a particular situation (Gibson et al., 1996; Robbins & Mary C, 2010).

The importance of leadership as a determining factor in an agency's success indicates the urgency of the need for an effective leader figure in an agency or organization by the characteristics of the organization or agency itself. It is assumed that effective leadership has a significant positive relationship with achieving the goals of the agency being led. In educational institutions, it is essential and urgent to have school principals as leaders, especially in the need to innovate learning to achieve the goals and objectives of the establishment of an educational institution. It is a little unfortunate that there are still many schools or educational institutions that do not have a vision-mission; goals and objectives (Bafadal et al., 2019). It is important to solve the collective problems that arise in the formulation of vision and goals that are not well organized. This is because educational institutions need support and appreciation from the community (Kholis et al., 2024). Therefore, leaders must be innovative in carrying out their leadership roles to produce maximum goals (Juharyanto et al., 2020).

Therefore, leadership is needed that can respond to the challenges and complexities that occur in today's educational context. Change leadership is progressive. It's used in educational institutions as well as in departments to respond to today's world as well as to technological developments. Change leadership is the leader's ability to make decisions based on a change-centered approach. Today's need for leadership is to build the capacity of individuals and organizations to make a change. Cahyono, et al. argue that change leadership is a leader's effort to create some change in an organization that aims to produce transformation and integrate all elements in the organization so that they work together and empathize with each other in driving change to be more useful and have a significant positive impact on the organization. Change leadership in an organizational context includes the steps taken to steer the organization from its current state to a desired future state, intending to improve the accuracy of resource use (Cahyono et al., 2019).

There have been many changes that have occurred and affected education policy today, one of which is the equalization of improving the quality of education (Bafadal et al., 2020; Juharyanto et al., 2020). In responding to these changes, schools will undoubtedly need to adapt and implement the policies that have been enacted, while balancing the existing school ecosystem. This is a real leadership challenge that requires strategies and innovations for school sustainability. Brawijaya Smart High School (BSS), a laboratory school of Brawijaya University, has seen a steady increase in enrolment over the past five years, with an average increase of around ten percent. Despite charging higher tuition fees than public schools, BSS continues to attract more students each year. The institution has several successful programs and has achieved recognition in various competitions, including art, music, class of youth, science, and cultural performances. Additionally, there has been an increase in the number of graduates being accepted into public universities and higher education institutions through computer-based written examinations (UTBK) and student achievement pathways, both domestically and abroad, such as Malaysia, Germany, and the United States.

The Principal's Role as Change Leader

Principals with their role as change agents should have a vision of change. So they can create a clear direction for the school (Widodo, 2017). According to Wibowo, change leadership can be viewed from the perspective of existing change, namely strategic, fundamental, cultural, and relational change leadership (Wibowo, 2012). Quality Education Management (QEM), together with the dimensions of school change, can identify principals' four important roles in making change successful: catalysts, creators, facilitators, and stabilizers. Therefore, the principal is expected to communicate the possibilities in the school or to communicate potential opportunities to the school community to improve the school.

In the context of school leadership, it is important to choose leaders who can improve the quality of processes and outcomes of graduates. Not those who use the trust they have been given to impress or to spread negativity about the organization. What educational institutions need in this digital age are leaders of Change. That's why leaders need to build a From-To contrast. Leaders who know where they (and their government) are and the organization's bigger vision (Kasali, 2017).

Therefore, any change leader must have a strategy to ensure the change process goes as expected. According to Wibowo, the strategies that change leaders can use are First, accelerating the intended changes in the future; Second, being able to the center of change or be the center of change; Third, having clear steps in leading a change; Fourth, balance between change and continuity; and finally, leaders can increase the satisfaction of their staff. The strategy of improving the quality of education in schools through change can also be done by paying attention to the student's discipline (Imron, 2012; Wibowo, 2012).

The inability of leaders to develop change strategies can cause failure. According to Wibowo, several strategies can be used by change leaders, including accelerating future changes; being the center (vortex/motor) of change; providing clear steps in leading change; balancing between change and continuity; and increasing employee satisfaction. Suharsaputra explained that educational innovation includes any new thing that can lead educational institutions to be more qualified in organizing the education or learning process to improve the quality of education, which is reflected in the performance of outstanding graduates, as well as outcomes that are beneficial to society (Suharsaputra, 2016; Wibowo, 2012).

Digital Learning Ecosystem

Digital Ecosystem in Education

Information technology exists to expand the dissemination of knowledge and is a powerful driver of educational reform, hence digital ecosystems have become an integral part of modern education. In the context of education, the digital ecosystem includes various elements such as hardware, software, communication networks, and digital content. It creates a more dynamic and responsive learning environment, which significantly affects learners, teachers, and educational institutions (Dreimane & Upenieks, 2022; Kengwe & Bhargava, 2014).

Digital ecosystems have become an integral part of the education sector, transforming how knowledge is accessed, managed, and delivered. This can be done by creating and using content that students find interesting, and by adding a fun element. In this way, the learning process can become more dynamic, stimulating learners' creativity to develop further (Bilotta et al., 2021; Mikre, 2011). The digital revolution touches several aspects and sectors, including education, which has rapidly and profoundly changed the way students learn. Thus, how technology can improve the face of education with cheaper accessibility may be one of the hopes for developing countries in particular (Qureshi et al., 2021). These aspects are then conceptualized into intelligent learning environments emphasizing flexibility and learning effectiveness, adaptability, and personalization to explore the right formula to implement in digital learning ecosystems to keep them healthy (Spector, 2014).

The urgency of implementing Digital Technology in assisting the Learning process in School

Technology has played an important role in the educational process both inside and outside the classroom for learners by helping them to create creativity and encourage educational processes with new patterns beyond traditional techniques that make the learning process more interactive because access to sharing and downloading knowledge becomes more flexible and straightforward so that learners become more enthusiastic about learning and sharing knowledge (Grainger et al., 2021; Lacka & Wong T.C, 2021).

Thus, it must be acknowledged that digital technology appeared as a tool for the critical condition of education some time ago (Araújo et al., 2021; Seale et al., 2021). Even the current endemic has not changed the functioning of technological optimization. However, educational policies are increasingly flexible and oriented towards the effectiveness of learning in each unit of educational institutions. It can also be seen that the government is very supportive of national integration in the education system, especially for areas outside the remote area. This is because digital technology helps to develop students' problem-solving skills, helps them with their thinking structures, and encourages an interesting atmosphere in the learning process.

Another advantage that can be gained by using digital technology is that it provides greater flexibility to educational institutions by accommodating the adjustments needed in implementing the current curriculum, which is of necessity based on students' needs (Dudar et al., 2021; Kosaretsky et al., 2022). The use of digital technology allows learners to become more proactive in the learning process, which is currently designed to be learner-centered, to participate in the development of their potential in the learning process (P. T. Kovács et al., 2015).

Some of the above shows how the urgency of digital technology to enhance the educational process in schools through the use of various digital resources provides opportunities for learners to download reference sources, use digital help desks, and upload

their creations in the learning process so that they can be used as study materials/references for others through channels such as blogs, wikis, educational videos, and podcasts by getting them used to collaborating and giving each other corrections to achieve constructive learning outcomes for shared learning (Borthwick et al., 2015; Kumar et al., 2022). Thus, it can be concluded that digital technology can facilitate access to education and optimize learning, technology combines inspiration into innovation and the meaningfulness of education becomes a realistic thing to achieve.

Implementation of Developing a Digital Learning Ecosystem

The digital ecosystem in educational institutions is a framework made up of hardware, software, and digital resources that are used for the enhancement of learning experiences, school management, and communication among all stakeholders in educational institutions (Kummanee et al., 2020). Therefore, the development of a digital learning ecosystem is an effort to create an integrated and inclusive learning environment using digital technologies. In this ecosystem, different elements such as learning platforms, content, learners, teachers, and supporting tools are connected to create a more effective, efficient, and engaging learning experience.

The digital ecosystem as an intelligent learning environment has considerable potential to develop personalized learning into adaptive learning. Thus, developing a digital-based learning ecosystem can be done by integrating smart learning, learning resources, physical and digital worlds, involving several types of devices, and integrating different approaches in teaching and learning with personalization and self-regulation of learning (Cheung et al., 2021; Gros, 2016; Peng et al., 2019).

Developing an efficient and effective digital ecosystem requires good planning, investment, and collaboration between all the stakeholders. This is because the ecosystem requires collaboration and integration of teachers, school members, and other stakeholders such as funding agencies and service providers (Benita et al., 2021). It is also crucial how the knowledge of each person or school community can be exchanged and shared to build an existing digital ecosystem (Ali et al., 2017).

Discussion

The COVID-19 pandemic has required schools around the world to adapt to change, which is often accompanied by uncertainty. In response to these changes, there is a need for innovations that are linked to a vision of change that can be responsive to the needs of educational institutions in the delivery of educational services to their students. While talking about educational institutions, it cannot be separated from leaders as the driving force in an educational institution. A successful principal acts as a change leader always focused on improving the quality of service delivery to students and stakeholders to produce quality graduates with global insight.

The results of this study show that change and uncertainty are challenges that can indeed lead to innovation in the improvement of the educational services provided at the Brawijaya Smart High School (BSS). This school manages educational inputs by managing processes to realize graduates who are religious according to the religion professed by each student, which is in line with three main visions of "Spiritual, Nationalistic, and Smart on a Global Level". To achieve this vision, the school needs effective leadership because the leadership aspect is crucial in achieving the school's vision. Therefore, school leaders need to continuously develop their capacity to improve their competence. Strategies are needed for policymaking, improving the competence of teachers and administrators, and continuous, relevant, and contextualized professional development (Nooruddin & Bhamani, 2019).



Figure 1. Main View of School Information System

In addition, change requires schools to adapt and reform continuously. Principals must be able to read internal and external challenges in the school's sustainability as a place of learning and teaching (Shaked & Schechter, 2016). Therefore, it can be said that principals are reformers and the ability to anticipate various changes is essential. Principals are expected to be good at change management. School organization is a means by which people work together to achieve common goals using their resources. School organizational development is a systematic, integrated, and planned approach to improving organizational effectiveness and solving problems.

In line with Netolicky's view that school leadership is a social practice as well as an individual and collective process, built by individuals but situated in and transformed by the community. Therefore, to build and develop the process, the principal needs to be accepted and loved by the staff for the transformation to take place (Netolicky, 2020). Principals need to promote sustainable solutions that involve the whole school community, including students, teachers, parents, and community members. The aspects of competence and effectiveness influence the principal's competence and success. Aspects of meaningfulness do not influence principals' competence, but principals' success (Bahadoran & Nazari, 2018).

In the context of this research, the uncertain changes since the COVID-19 pandemic have created uncertainty for schools in providing learning services to their students. There are four orientations of the leader's attitude in the face of uncertainty, such as the role of the principal as leader of change, strategies implemented, innovations of change, and supporting and inhibiting factors in the development of a digitally based learning ecosystem. School leaders act immediately to respond to sudden and uncertain changes. The pandemic came suddenly and uncertainly, causing educational elements to adapt and the government to formulate policies to address national educational effectiveness and efficiency. The head of the BSS, in this case, responded by developing an application called SIBRASCHO, which initially meets the needs of online learning and e-report cards, which then continuously develops according to the needs of digitalization in support of teachers, students' attention, also effectively and intensely communicating with parents. this is in line with the opinion of Gesel, According to him, the thinking, decisions, strategies, and innovations of leaders are very beneficial for the success and sustainability of the organization, in this case, the school

(Gesell, 2010). In developing a digital-based learning ecosystem, the BSS Principal's strategy is to take input from teachers, consider the urgency, and identify the weaknesses of the system so that it can be continuously evaluated and developed according to needs. Change leaders are always associated with planned change and deal constructively with human emotions (Senior & Fleming, 2006).

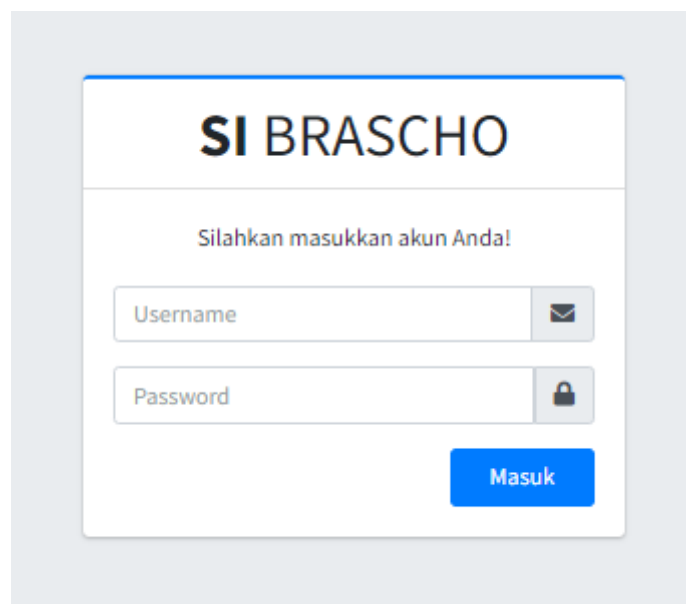


Figure 2. Account Login Main View

The results of this study also show that the Principal of BSS in his lead changed all learning services and school administration with digital-based services, including exams, classroom learning, extra classes, learning references made by subject teachers, student activity reporting, and student assignment bills to parents, extracurricular management, excellent program management, namely religious based character education with smart kitab according to students' religion, Supervising the discipline of students and teachers, developing the capacity of teachers by allowing them to increase their capacity both independently and collectively, developing the implementation of supervision by entering the tools and results of supervision into the SIBRASCHO application to be followed up by providing performance bonuses to active and outstanding teachers and providing coaching to teachers in need. and services that facilitate the process of researchers and guests to get the best service according to their needs, so that disposition can be provided effectively without disrupting the implementation of teaching and learning activities and without disturbing the concentration of teachers, because the communication process is carried out according to school procedures and policies, taking into account the needs and interests of guests. It is still being analyzed and evaluated and will continue to be developed and improved if there are weaknesses in its implementation. This aligns with the view of Cahyono that change leadership should strive to integrate all elements in the school to create a movement for change (Cahyono et al., 2019).

While there are supportive and inhibiting factors in the context of developing a digitally based learning ecosystem, the enabling factors that play a role in helping leaders are human resources that are quick to adapt and have job loyalty to the institution, so that changes take place with good synergy without hurting the internal organization. Furthermore, parents supported the movement for change by providing learning materials, such as smartphones and laptops, for their children's exams. The main obstacle to implementation

thus far has been the slow adaptation to national policies. The development of digitalization in the SIBRASCHO application is tailored to the needs of schools, while the national curriculum change policy requires adjustments that necessitate several tools to accommodate these policy changes. Therefore, it is necessary to formulate the policy following the interests of schools. the challenge that remains to be pursued is how to engage students to minimize inertia in adaptation, especially for students at level X, so that they are accustomed to a competitive, varied, and active learning environment, both individually and in groups. Through the analysis of these factors, as Wibowo argues, principals can act as catalysts, creators, facilitators, and stabilizers to maximize the potential of the school and continuously improve services in a better direction (Wibowo, 2012).

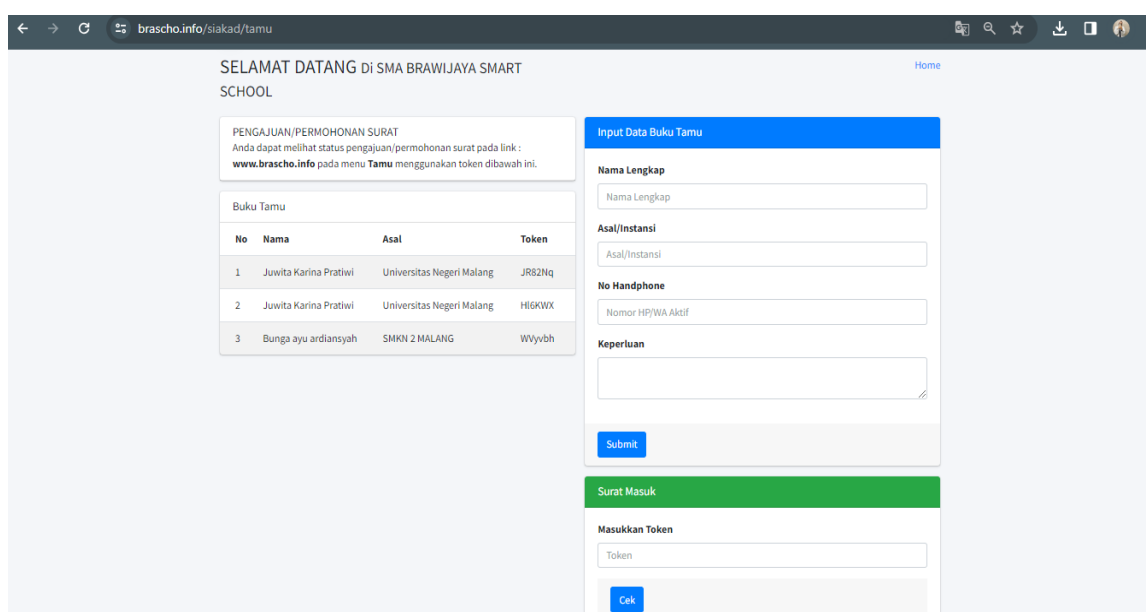


Figure 3. Menu display for guests

Conclusions

In developing a digital learning ecosystem, change leadership is needed to organize students, teachers, and the school community to implement digital learning, particularly in designing, implementing, evaluating, and improving programs, as well as continually innovating and changing in the face of uncertain change phenomena. The attitudinal orientation that can be done is that the principal acts as a change leader by implementing strategies that align with the needs and applicable national policies, innovating changes, and analyzing the supporting and inhibiting factors in developing a digital-based learning ecosystem.

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