Challenges and Strategies in Adopting Google Workspace for Education: Perspectives from Educational Leaders in Indonesia

ABSTRACT

Effective educational technology adoption and implementation have become crucial for educational institutions in the digital transformation era. However, this study aims to identify the challenges faced by educational leaders in adopting and implementing Google Workspace for Education in educational institutions, as well as strategies to address these challenges. A qualitative approach was employed, utilizing in-depth interviews and specially designed spreadsheets to gather perspectives and data from 70 educational foundation leaders and school principals in Indonesia. Thematic analysis was used to analyze the collected data. The findings revealed challenges such as mindset change, technological barriers, collaboration issues, and resource constraints in adopting Google Workspace for Education. The study identified six strategies to overcome these challenges, including supervising teachers' work, enhancing participation in training, fostering collaboration among teachers, monitoring and evaluating usage, preparing supportive infrastructure, and gaining support from school leaders. This research provides valuable insights into the perceptions and strategies of educational leaders in adopting and implementing Google Workspace for Education, contributing to a deeper understanding of the digital transformation in educational institutions and its implications for educational technology development in Indonesia.

Keywords: Digital Transformation, Educational Technology, Google Workspace for Education, Challenges, Strategies, Educational Leaders

1. INTRODUCTION

This research is based on the need to analyze the use of Workspace for Education as a tool for transforming education in Indonesia by educational foundation leaders and school principals. In the digital transformation era, educational institutions in Indonesia are expected to adopt and implement educational technology effectively and efficiently[1]. Education 4.0 emphasizes teaching and learning in the digital era [1], which requires the transformation of digital tasks in Education[2] as well as educational strategies in digital transformation[3].

The COVID-19 pandemic has become a trigger for digital transformation in education[4], which has driven increased research on digital transformation in education during COVID-19 [5], [6]. Several studies have explored the digital knowledge and skills needed in digital transformation in public schools in post-COVID-19 Greece[7], the impact of digital transformation of everyday life on the education of young people and the importance of information management research in addressing this change[8], as well as digital transformation enzymes in teaching [9].

Previous research has investigated transformation in higher education institutions[10], [11], the use of communication technology by students [12], digital literacy in higher education, including skills, uses, opportunities, and constraints of digital transformation [13], a paradigm

shift in higher education in the context of digital transformation [14], perception and use of digital media by students and [15], as well as the ongoing management of digital transformation in higher education [16].

In the context of Google, Google has several features that researchers have studied. For example, research by Chen et al. demonstrated that Google Translate produces a more accurate translation from English to Spanish than Chinese. In contrast, translations by Chinese human translators are more accurate than Google Translate Language [17]. In addition, using Google's educational applications, such as Gmail, Docs, Sites, Google+, and Calendar, in teaching computer curricula in tertiary institutions can affect student achievement[18].

In addition, other Google features have also received attention in research. For example, Google Meet, Google's video conferencing app, is used in distance education and gets positive student views for facilitating communication and collaboration[19]. Meanwhile, research by Klein et al. mentions that Google Calendar, Google's scheduling tool, has enhanced the functionality of the campus experience with effective service and support cost savings at Valparaiso University[20]. These features, along with other features provided by Google, have been the subject of research and provide benefits in educational contexts[19], [21]–[23].

The influence of digital transformation can also be seen in the profiles of teachers in the context of digital transformation in schools[24], the formation of teacher professionalism in digital transformation in higher education [25], ICT competencies and teacher technology leadership practices in pedagogical digital transformation initiatives[26], competency management with innovation-based change and exploration of challenges and transformation in digital transformation [27], competency and teacher transformation in digital education [28], and pedagogy in the era of digital transformation [29], [30].

However, there are challenges and obstacles in implementing digital transformation in schools[31], the dark side of digital transformation in teaching [32], and the shift from dual digitization to digital learning spaces [33]. The impact of digital transformation on learning in educational institutions has been explored [34]. Teachers' perceptions of digital transformation in the classroom through the use of tablets have been studied[35], as well as elementary students' perceptions of tolerance through technology-supported instruction in digital transformation [36]. Meanwhile, the main challenges faced by educational foundation leaders and principals in implementing digital transformation include limited technological infrastructure, lack of digital skills among staff and educators, and the need to integrate educational technology into existing curricula and teaching methods.

Therefore, research on the role of educational foundation leaders and school principals in digital transformation is very important. This research will explore educational leaders' roles and challenges in implementing digital transformation. Decision-making, change management, and stakeholder collaboration will be examined to understand effective leadership strategies in addressing digital transformation challenges.

Education leaders must consider the key components of digital transformation to achieve successful systemic Changde[37]. Adopting and implementing Workspace for Education can be an alternative solution to enhance digital transformation in educational institutions. Appropriate training of staff and educators in using Workspace for Education, increased investment in technology infrastructure, and collaboration with relevant stakeholders are critical in addressing the challenges identified.

This research will build on and complement previous research by exploring the specific perceptions of educational foundation leaders or school principals in Indonesia regarding challenges, visions of change, and strategies for dealing with digital transformation using Google Workspace for Education. Thus, this research will provide a richer and more focused understanding of the Indonesian context and complement the existing literature. (1) What are the primary challenges faced by educational leaders in Indonesia when adopting Google Workspace for Education in the context of educational digital transformation? (2) What strategies can educational leaders employ to address these challenges in adopting Google Workspace for Education and facilitating effective educational digital transformation?

2. METHOD

This study uses a qualitative approach as the research method Led[38]. The research design used was a case study, with research subjects including 70 educational foundation leaders and school principals from various institutions in Indonesia. The study population consisted of leaders of educational foundations and school principals in Indonesia, and the research sample was selected purposively based on relevant experience and knowledge in adopting and implementing Google Workspace for Education. Here is a table showing the distribution of research informants by province, as attached:

Table 1: Research subjects educational foundation leaders and school principals from various institutions in Indonesia

Province	Name of School	domain
Bali	SMAN 1 Kuta Selatan	smansakutsel.sch.id
	SMPN 3 Tualang	smpn3tualang.sch.id
Bangka Belitung	Mutiara Harapan Bangka	bangka.mutiaraharapan.sch.id
Banten	Sekolah Mutiara Insani	mutiarainsani.sch.id
	Saint John's School	saintjohn.sch.id
	SCI Islamic School	scislamicschool.com
	Mutiara Harapan	mutiaraharapan.sch.id
	EVFIALAND School	evfialandschool.sch.id
Jakarta	Tri Ratna School	triratnaschool.com
	SMP Islam At-Taubah	smpi-attaubah.sch.id
	Dharmasuci	dharmasuci.sch.id
	Refo Indonesia	refoindonesia.com
	Sekolah Charitas	sekolahcharitas.sch.id
	Sekolah Makarios	sekolahmakarios.id
	Metland School Puri	metlandschoolpuri.sch.id
	SLI	Sli-edu.org
West Java	SMK IT Nurul Huda	smkitnurulhuda.sch.id

	Gema Nurani	gemanurani.sch.id
	YSS	yss.or.id
	Quba	Quba.sch.id
	Al Imam School	Alimamischool.com
	Dian Didaktika Islamic School	diandidaktika.sch.id
	NFBS Bogor	nfbs-bogor.sch.id
	Equal Bright	equalbright.com
	SMP Islam Attawwaabiin	smpislam.attawwaabiin.sch.id
	Thariq bin Ziyad	Thariq.sch.id
	SMAIT Al Maka	smaitalmaka.sch.id
	SMAN 5 Depok	sman5depok.sch.id
	SMANTIBOO	smantiboo.sch.id
	SekolahTalenta	sekolahtalenta.sch.id
East Java	SMP-SMK Kota Madiun	smppsmkotamadiun.sch.id
	Bhakti Samudera	bhaktisamudera.com
	SMAN 1 Mojosari	sman1mojosari.sch.id
	SMKN 1 KLK	smkn1klk.sch.id
	SK Alumajang	skalumajang.sch.id
	SMP Budi Utomo Perak	smpbudiutomoperak.sch.id
	Charis	charis.sch.id
	VITA School	vitaschool.sch.id
West Kalimantan	SK Ketapang	skketapang.org
	KK Pontianak	kkpontianak.sch.id
	SK Ketapang	skketapang.org
East Kalimantan	SMP IT TBZ	Smpit-tbz.sch.id
	VidatraBontang	vidatra.sch.id
	YPPSB	yppsb.id
	SMP Vidatra	smp-vidatra.sch.id
Centre Maluku	SMPN 1 Banda	smpn1banda.sch.id
NTT	SMAN 1 Mauponggo	sman1mauponggo.sch.id
	STKIP Weetebula	stkip-weetebula.ac.id
	Methodist-6	methodist-6.sch.id
Papua	Papua Harapan	papuaharapan.sch.id
	Papua Harapan	Papuaharapan.sch.id
Riau	SMPN Binus Kota Dumai	smpnbinsuskotadumai.sch.id
South Sulawesi	SD Wahdah Islamiyah	sdwahdah.sch.id
	SMA Yayasan Pendidikan Sorowako	smayps.sch.id
	Al Khairiyah SBY	alkhairiyahsby.sch.id
	Sekolah Pundarika	sekolahpundarika.sch.id
South Sumatera	SDL Lawewu	sdlawewu.yps.sch.id

	SD IT Al-Qudwah Mura	sditalqudwahmura.sch.id
North Sumatera	YPN BrigjendKatamso	ypnbrigjendkatamso.sch.id

In collecting data, the instruments used were in-depth interviews and filling in the answers in a specially designed spreadsheet[39]. In-depth interviews were used to gain in-depth perspectives and understanding from the informants while filling out answers in a spreadsheet was used to collect written data regarding the use of Google Workspace for Education. Additionally, in-depth interviews were also conducted using Google Chat to facilitate real-time communication and further explore the nuances of informants' experiences and insights.

The collected data were then analyzed using the thematic analysis method[40]. Thematic analysis was carried out by identifying the main themes from the data to provide an in-depth understanding of the informants' perceptions and strategies in adopting and implementing Google Workspace for Education.

3. RESULTS AND DISCUSSION

3.1 Challenges Faced by Leaders

Based on the field research conducted has yielded valuable findings in identifying and classifying the challenges faced by leaders in implementing educational technology. The data collected in this research provides a deeper understanding of the various challenges faced in using Google Workspace for Education and the factors that influence the adoption and use of this technology in educational environments. The research findings are presented in the following table.

Table 2: Table of data on the classification of challenges faced by leaders

No	Theme	Challenge
1	Mindset Acceptance and Change	- Lack of openness and willingness to try new technologies. - Teachers who are still used to old collaboration patterns. - Difficulty changing the teacher's mindset to adapt to technology - The challenge of changing a comfortable mindset
2	Use and Utilization of Technology	- Technological barriers and gadget limitations from parents. - Accustomed to using other applications and resistance to change. - Challenges in maximizing features and applications in Google Workspace for Education. - Lack of knowledge and understanding of the use of technology.
3	Collaboration and Communication	- Lack of communication and collaboration between teachers and staff. - Lack of qualified IT team. - Unorganized workflow. - Lack of awareness of the importance of preparing and organizing data/files. - Lack of collaboration with parents and other stakeholders.
4	Capacity Building and	- There needs to be a specific coach who can guide teachers in maximizing Google Workspace for

	Training	Education. - Lack of intensive training and development opportunities for teachers and staff. - The teacher's speed in keeping up with technological developments. - Self-taught learning and limited trainer resources.
5	Infrastructure and Resources	- Inadequate equipment for educators and teaching staff. - Limited facilities and devices owned by students. - Limited internet network and signal in certain areas.
6	Evaluation and Measurement	- Lack of measurement and evaluation of the application of technology. - Challenges in evaluating and measuring the impact of using Google Workspace for Education.
7	Environment and Culture	- Changes in mindset and old habits in using the application. - The culture of the school environment and stakeholders that need more time to be ready economically and socially. - The teacher-student-parent comfort zone for common technological situations.
5	Infrastructure and Resources	- Inadequate equipment for educators and teaching staff. - Limited facilities and devices owned by students. - Limited internet network and signal in certain areas.
6	Evaluation and Measurement	- Lack of measurement and evaluation of the application of technology. - Challenges in evaluating and measuring the impact of using Google Workspace for Education.

The table above provides a structured overview of the challenges faced using Google Workspace for Education, which can help plan appropriate resolution steps. Based on the priority issues above, the main focus should be on teacher capacity building and training, including changing mindsets, understanding the technology, and using Google products. In addition, it is important to pay attention to the infrastructure and resources required to optimize Google Workspace for Education. Furthermore, efforts are needed to build a culture of innovation in schools and improve collaboration and communication between teachers, students, and other stakeholders.

In this research, the findings show that leaders face several challenges in implementing Google Workspace for Education. The first challenge relates to acceptance and change in mindset, where a lack of openness and an attitude of being willing to try new technologies is one of the main obstacles. This challenge follows the view that digital transformation in education requires changes in digital tasks and educational strategies to deal with them[1].

The second challenge is related to the use and utilization of technology, which includes technological barriers and gadget limitations from parents, resistance to change, and lack of knowledge and understanding of technology use. The results of this study are relevant to those who mention the importance of information management research in addressing this change[8]and educational strategy in digital transformation [3].

The third challenge relates to collaboration and communication, including a lack of communication between teachers and staff, a need for a qualified IT team, and a need for more awareness of the importance of preparing and organizing data/files). Previous research has highlighted the importance of collaboration and communication in digital transformation in education[2], [9], and competency management with innovation-based Changde[27].

A further challenge is capacity building and training, where more intensive training and development opportunities for teachers and staff are needed. Previous research emphasized the need for developing teacher professionalism in digital transformatif[25]and teachers' ICT competencies in pedagogical digital transformation initiatives [26].

The next challenge concerns infrastructure and resources, including limited equipment for educators and students and limited internet networks in several areas. The results of this study are relevant to previous research, which highlighted the importance of investing in technology infrastructure to support digital transformation in education[13].

Another challenge is evaluation and measurement, where the need for measurement and evaluation of the application of technology and challenges in evaluating and measuring the impact of using Google Workspace for Education are obstacles. Previous research has revealed the need to evaluate digital transformation in Education[34]and use technology-enabled instructions in digital transformatif[36].

The final challenge relates to the environment and culture, including changes in old mindsets and habits in using applications and culture in the school environment that is not ready economically and socially. Relevant theoretical studies emphasize the importance of teacher understanding and transformation in digital education[28]. and teachers' perceptions of digital transformation in the classroom [35].

In order to overcome these challenges, this study recommends adopting and implementing Workspace for Education as an effective alternative solution. Appropriate training of staff and educators, increased investment in technology infrastructure, and collaboration with relevant stakeholders are important factors in addressing the identified challenges. Previous research has supported the usefulness and effectiveness of Google tools in educational contexts[19], [21] and the importance of teacher competency and transformation in digital education [29].

3.2*Strategies that Leaders Can use*

This field research aims to explore strategies that can be used to achieve the goal of using Google Workspace for Education in educational settings. Table 3 presents research results that identify the challenges faced and strategies that can be implemented to overcome these challenges.

Table 3: Strategies used to achieve the goals of using Google Workspace for Education

No	Theme	Challenge
1	Supervise teacher work from administrative aspects at Gdrive, and aspects of lesson content at Gclass & Gmeet	- Carry out supervision of teacher work on a scheduled basis and provide feedback - Create Google Workspace for Education accounts for students - Setting up teacher administration formats in Gdocs & Gsheet - Conducted Google Workspace for Education workshops for teachers
2	Increase teacher participation in Google Workspace for Education training	- Conduct regular training and outreach to teachers - Form a driving team that provides support to teachers - Provide awards and rewards to teachers who actively use Google Workspace for Education
3	Increase collaboration between teachers in using Google Workspace for Education	- Encouraging collaboration between teachers through sharing sessions and periodic meetings - Create online discussion groups or forums to facilitate collaboration between teachers
4	Monitoring and evaluating the use of Google Workspace for Education	- Monitoring the use of Google Workspace for Education by teachers - Measure progress and progress using Google Workspace for Education - Provide feedback and appreciation to teachers who are actively using Google Workspace for Education
5	Prepare facilities and infrastructure to support the use of Google Workspace for Education	- Ensuring the availability of adequate internet access - Updating necessary hardware and software - Assembling an IT team ready to provide technical support to teachers and students

Based on the table above, this research has identified several strategies that can be used to achieve the goal of using Google Workspace for Education. The first strategy is supervising the teacher's work from the administration aspect at Gdrive and the lesson content aspect at Gclass&Gmeet. Involves scheduling supervision by providing feedback, creating Google Workspace for Education accounts for students, providing teacher administration formats in Gdocs and Gsheets, and conducting Google Workspace for Education workshops. The second strategy is to increase teacher participation in Google Workspace for Education training by conducting regular training and outreach, forming a driving force team that provides support, and rewarding teachers who actively use Google Workspace for Education.

The third strategy is increasing collaboration between teachers using Google Workspace for Education. It can be achieved by encouraging collaboration through sharing sessions, periodic meetings, and online discussion groups or forums. The fourth strategy is to monitor and evaluate the use of Google Workspace for Education by regularly monitoring progress and developments in use and providing feedback and appreciation to teachers who are actively using Google Workspace for Education.

The fifth strategy is to prepare facilities and infrastructure to support using Google Workspace for Education, including ensuring adequate internet access, updating necessary hardware and software, and forming an IT team ready to provide technical support. Finally, the sixth strategy is to gain support from school leaders by obtaining commitment and support from them and involving school leaders in training and outreach to teachers.

Previous research supports these strategies in the context of digital transformation in education. For example, previous research has shown that proper training of staff and educators in using educational technology is a key factor in achieving successful digital transformation in educational institutions [1]. In addition, support and commitment from school leaders are also important in encouraging the use of educational Technology[37].

Previous research in the context of using Google Workspace for Education that specifically identifies the strategies used to achieve this goal has yet to be found. However, previous research has investigated strategies and practices for addressing digital transformation challenges in education in general[31]–[33]. Therefore, this research makes an important contribution to identifying concrete strategies that can be used in the use of Google Workspace for Education, fills gaps in previous research, and provides a deeper understanding of the implementation of educational technology in educational institutions.

The strategies identified in the research for implementing Google Workspace for Education can be utilized by a broad range of users within the educational ecosystem. This includes teachers, administrative staff, students, and school leaders. The applicability and relevance of these strategies are contingent on the user's context, such as their experience with technology, their role within the institution, and the existing infrastructure of the educational setting.

The Technology Acceptance Model (TAM) can provide a theoretical framework for understanding the factors that influence the adoption of Google Workspace for Education. TAM posits that perceived ease of use and perceived usefulness are fundamental in predicting user acceptance and utilization of new technology. By ensuring that Google Workspace for Education is user-friendly and beneficial for educational tasks, educators and administrators are more likely to embrace and incorporate it into their daily activities.

Furthermore, the Unified Theory of Acceptance and Use of Technology (UTAUT) could also serve as a lens to examine the strategies' effectiveness. UTAUT suggests that performance expectancy, effort expectancy, social influence, and facilitating conditions are significant determinants of technology adoption. In the context of this research, strategies that address these determinants—such as training, support systems, and infrastructure—can significantly enhance the likelihood of successful technology integration.

4. CONCLUSION

Based on the research results that have been presented, we can identify several main conclusions. This research aims to identify the challenges and strategies educational leaders face in adopting and implementing Google Workspace for Education in educational institutions. In the digital transformation era, the effective and efficient use of educational

technology is important for educational institutions in Indonesia. The challenges faced include needing more openness and changes in mindset, technological barriers and limited resources, lack of collaboration and communication, and infrastructure and resource problems.

This study identified six strategies that can be used to overcome these challenges. These strategies include supervising teacher work, increasing teacher participation in training, increasing teacher collaboration, monitoring and evaluating use, preparing supporting facilities and infrastructure, and getting support from school leaders. The findings of this research are supported by relevant theoretical studies, which emphasize the importance of proper training for staff and educators, support from school leaders, and collaboration between teachers in achieving successful digital transformation in educational institutions.

This research makes an important contribution by identifying concrete strategies for using Google Workspace for Education, which can help educational institutions overcome the challenges they face and increase the effectiveness of educational technology. With a deeper understanding of the implementation of educational technology, education leaders can take the right steps to face the challenges of digital transformation in an ever-evolving education era. This research has the potential to significantly contribute to the development of technology-oriented and sustainable education in Indonesia.

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