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"The Impact of Face-to-Face Learning Systems on the Psychological Well-being and Access Disparities of Second-Year Students at SMPK Santa Maria Assumpta Kupang in the Digital Era"

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ABSTRACT (10 PT)

This study examines the impact of face-to-face learning systems on the psychological well-being and access disparities experienced by second-year students at SMPK Santa Maria Assumpta Kupang in the digital era. Employing a descriptive qualitative approach, this research investigates the multifaceted challenges faced by students, teachers, and parents in implementing learning systems amidst technological limitations. The findings reveal that while face-to-face learning systems are preferred by students, significant barriers persist, including frequent power outages, inadequate internet infrastructure, limited digital literacy among educators and students, and economic constraints affecting families' ability to afford necessary technology and data packages. These challenges contribute to heightened anxiety levels among adolescents and create substantial disparities in educational access. The study further identifies that teachers' low remuneration, ranging from IDR 400,000 to IDR 950,000 monthly, diminishes their motivation to conduct online instruction. The research highlights the pressing need for targeted interventions, including enhanced technological infrastructure, teacher training programs, and equitable resource allocation to bridge the digital divide and promote the psychological well-being of students in underserved regions.

INTRODUCTION (Capital, bold, Times new romance 11 pt)

The integration of digital technology in education has become an increasingly critical component of contemporary learning systems, particularly following the COVID-19 pandemic, which compelled a transition from face-to-face teaching to distance learning reliant on internet networks (Bates, 2015; Selwyn, 2016; Muzayanah et al., 2025). The pandemic, which has afflicted the world since 2019, is reported as one of the most severe health crises with significant impacts on the education sector; however, the transition to digital learning platforms has exposed and exacerbated existing disparities in educational access, particularly in developing regions and underserved communities (Weri et al., 2025; Setyanti et al., 2025). The province of East Nusa Tenggara (Nusa Tenggara Timur/NTT), and specifically Kupang City, faces distinctive challenges in implementing effective digital learning systems due to infrastructural limitations and socioeconomic constraints (Muzayanah et al., 2025). Based on preliminary assessments and existing data, partner schools in this region exhibit several potential challenges requiring immediate attention, including frequent power outages occurring at specific times, insufficient internet connectivity and data credit availability, and instances where scheduled learning sessions were disrupted due to poor signal quality. This condition aligns with research findings in Indonesia's 3T regions (Frontier, Underdeveloped, and Outermost areas), which indicate that many schools still lack basic infrastructure such as internet connections, reliable electricity,

and transportation all of which hinder teacher development and student learning (Burhan, 2025; Setyanti et al., 2025). Beyond these infrastructural constraints, both students and teachers demonstrate varying levels of proficiency in utilizing online learning platforms, with some lacking the necessary technological competencies for effective participation in digital education (Weri et al., 2025; Setyanti et al., 2025).

SMPK Santa Maria Assumpta, the focal institution of this study, currently employs 21 teachers and 8 administrative staff members, of whom only five hold permanent government (civil servant) positions, while the remaining 31 teachers serve as honorary staff receiving monthly honoraria ranging from IDR 400,000 to IDR 950,000 a figure substantially below the regional minimum wage. Notably, there are no provincial contract teachers within the institution; despite numerous applications from local teachers for provincial contract positions, none have successfully secured permanent employment status. The significant salary disparity between local teachers and those in central regions has considerably diminished educator motivation to conduct online lessons, contributing to systemic challenges in implementing effective digital learning systems. Research demonstrates that adequate compensation contributes significantly to the work motivation of non-permanent teachers, which in turn positively impacts their performance (Rahayu & Rindaningsih, 2025), while recognition and commitment have direct and significant effects on transformational leadership, which subsequently serves as a key mediating variable in enhancing teacher job satisfaction (Hardianto et al., 2025).

Distance learning even when utilizing systems designed to simulate face-to-face interaction—creates unique stress and anxiety for parents who lack laptops or smartphones to access necessary applications, a challenge often compounded by limited technological proficiency among parents. Research indicates that the implementation of distance learning in Indonesia generates significant psychological challenges for students, with 13.29% experiencing high stress levels and 41.82% experiencing moderate stress (Muzayanah et al., 2025). Furthermore, while schools have implemented online learning systems, students face various obstacles: they may lack knowledge of how to save digital course materials, struggle to discuss academic content with their parents, experience internet data package deficiencies, encounter frequent network disruptions, or face difficulties operating Android smartphones. The economic realities of families in Kupang City further exacerbate these challenges, where many parents depend on agriculture or fishing for their livelihoods, making the procurement of internet data packages for children's education economically burdensome. Consequently, purchasing data packages is often not prioritized, as securing resources for basic necessities such as food and drink takes precedence over acquiring knowledge through internet-based learning. Research shows that students residing in rural areas tend to experience higher stress levels compared to their urban counterparts, as better economic conditions in urban areas can provide adequate infrastructure, sanitation, and educational facilities (Cao et al., 2020; Muzayanah et al., 2025).

The continued reliance on online learning systems poses potential risks of detrimental consequences for the youth of NTT, particularly in Kupang City, as material delivery is often ineffective and student anxiety levels may rise. Even in traditional face-to-face classrooms, students can exhibit disruptive behavior, which is often exacerbated in online learning environments. Research demonstrates that many students encounter obstacles during online learning, including poor signal quality, lack of focus, learning difficulties, and limited interaction with peers all of which can ultimately induce stress in children (Puspitasari & Sulastri, 2022). Prolonged and indefinite distance learning can negatively affect students' psychological well-being, leading to manifestations of anxiety, fear, excessive worry, and psychosomatic issues that may potentially escalate into depression. This is particularly concerning for children over the age of 12—a developmental stage characterized by a transition from primary family focus to greater emphasis on social interactions with peers. The Indonesian Child Protection Commission (KPAI) recorded that 79.9% of children complained about online learning processes

conducted without interaction, which caused them stress (Muzayanah et al., 2025), while research involving 1,174 students at Islamic junior and senior high schools in Bali and East Nusa Tenggara revealed that students reported physical, emotional, and behavioral difficulties with several stress triggers, including fatigue, headaches, irritability, anxiety, decreased learning motivation, and concentration difficulties (Muzayanah et al., 2025).

The findings of Cao et al. (2020), involving 7,143 students participating in online learning, indicate that 0.9% experienced severe anxiety, 2.7% experienced moderate anxiety, and 21.3% experienced mild anxiety. Even prolonged waiting times for teachers to appear on applications to provide explanations can trigger anxiety in adolescents. Other research also reveals that 13% of students experience symptoms of mental difficulties ranging from mild to severe depression, with 93% of students exhibiting depressive symptoms aged 14-18 years (Muzayanah et al., 2025). The persistent use of online learning systems in the context of limited infrastructure and resources poses significant threats to the youth in NTT, as this method is not only relatively ineffective in delivering educational material but also elevates anxiety levels among students, potentially contributing to adverse mental health outcomes.

This situation necessitates a comprehensive examination of the impact of learning systems particularly the face-to-face approach on students' psychological well-being and the access disparities that exacerbate educational inequalities. This research is therefore designed to address questions concerning how face-to-face learning systems impact the psychological well-being of second-year students at SMPK Santa Maria Assumpta Kupang in the digital era, what access disparities to digital learning resources exist among students and how these disparities affect their educational experiences, the primary obstacles to effective implementation of learning systems at the institution and how these obstacles manifest across different stakeholder groups, and what interventions and strategies can be implemented to mitigate these challenges and promote equitable and effective learning experiences.

The evolution of digital technology has fundamentally transformed the educational landscape, offering unprecedented opportunities for learning delivery, content accessibility, and pedagogical innovation; however, this transformation has been unevenly distributed, with significant disparities emerging between well-resourced and underserved communities (Bates, 2015; Setyanti et al., 2025). Teaching in the digital age requires not only technological infrastructure but also pedagogical adaptation, teacher training, and consideration of diverse learner needs (Selwyn, 2016), wherein effective technology integration in education demands a holistic approach addressing both technical and human factors, including digital literacy, content development, and the psychosocial dimensions of learning environments. Research on technology adoption among teachers indicates that technology acceptance involves not merely technical skills but also beliefs, attitudes, and organizational support (Ertmer & Ottenbreit-Leftwich, 2015), while the digital divide in educational contexts manifests across multiple dimensions, including access to devices, internet connectivity, digital literacy, and the ability to effectively utilize technology for learning purposes (Nakula, 2024; Putra, Aziz, & Aini, 2025).

Digital Divide Theory provides a critical framework for understanding how technological disparities shape educational inequality, with first-level digital divide referring to unequal infrastructure access, while second-level digital divide concerns differences in digital literacy and the ability to use technology effectively (Setyanti et al., 2025).

Research has documented the persistence of digital divides in education across Indonesia's 3T regions, which face compounded challenges including geographical isolation, inadequate infrastructure, economic constraints, and limited educational resources (Syahmahita & Ayuni, 2022; Koesnandar, 2023), where the Indonesian government has officially designated 62 regencies and cities as 3T areas under Presidential Regulation Number 63 of 2020. Pakaya et al. (2020, 2023) have explored innovative solutions such as the Mini Server Lentera as alternative digital learning approaches in the 3T context, demonstrating the need for context-specific interventions, while the development of community-based blended learning models for 3T regions indicates that approaches prioritizing local needs, cultural

relevance, and infrastructure realities present viable frameworks for leveraging technology to bridge educational gaps in remote areas (Weri et al., 2025). The impact of digital disparities in education extends beyond immediate access issues to affect learning outcomes, student engagement, and psychological well-being, where students lacking adequate access to digital resources experience educational disadvantages that can perpetuate socioeconomic inequalities (Fardila et al., 2024). Research in Indonesia demonstrates that digital adoption through internet access and digital device ownership contributes to the sustainability of children's education, and when households in 3T areas have internet connectivity and digital devices equivalent to those in non-3T areas, the likelihood of their children attending school is equally substantial (Setyanti et al., 2025).

The intersection of digital learning and psychological well-being has emerged as a critical area of educational research, where the transition to online learning during the COVID-19 pandemic brought to the forefront concerns regarding the psychological effects of virtual instruction, particularly on adolescent populations (Cao et al., 2020; Puspitasari & Sulastri, 2022; Widyaningtyas et al., 2025). Adolescence, defined as the developmental period between ages 10 and 19, represents a critical phase of psychological and social development wherein individuals undergo significant neurological, cognitive, and psychosocial changes affecting emotional regulation, social relationships, and identity formation, such that disruption of social connections and peer interactions through distance learning can have pronounced effects on adolescents' psychological well-being (Dewi, 2022; Fardila et al., 2024).

Longitudinal research on self-regulation and student mental health in Merdeka digital learning demonstrates significant improvements in digital well-being and student self-regulation, accompanied by gradual reductions in academic stress, supporting Zimmerman's self-regulated learning theory and highlighting the need to integrate digital literacy and self-regulation training in the implementation of the Merdeka Curriculum (Widyaningtyas et al., 2025). The implementation of digital education systems in Indonesia faces numerous challenges, including inadequate infrastructure in remote areas, limited teacher digital literacy, teacher compensation constraints affecting motivation, and insufficient parental support due to literacy and economic limitations (Kemendikbudristek, 2023; Muthohirin, 2019), while the Merdeka Belajar (Freedom to Learn) policy represents a comprehensive initiative to address these challenges, yet implementation gaps persist, particularly in underserved regions (Prasetyo, 2025; Burhan, 2025).

Research on urban and rural teacher perspectives on Indonesian educational reform reveals that rural teachers are generally more positive about reform but struggle with limited resources and unclear policy directives, while approximately 20% of teachers in remote areas are reported absent, a factor associated with student absenteeism, dropout rates, and poor academic performance (Burhan, 2025).

This study is informed by several complementary theoretical frameworks, beginning with Bandura's Social Cognitive Theory, which provides a framework for understanding how individuals learn and develop within social environments by emphasizing the roles of self-efficacy, observational learning, and environmental factors, thereby explaining how students' beliefs about their technological capabilities influence their engagement with digital learning (Ertmer & Ottenbreit-Leftwich, 2015; Oliveira Neto et al., 2024). Furthermore, Bronfenbrenner's Ecological Systems Theory recognizes the multiple environmental systems influencing individual development, including microsystems (family, school), mesosystems (connections between microsystems), and macrosystems (cultural values, policies), enabling analysis of how various contextual factors interact to shape students' educational experiences.

Deci and Ryan's Self-Determination Theory highlights the importance of autonomy, competence, and relatedness for psychological well-being and motivation, wherein in the context of online learning, deficiencies in autonomy, competence, and relatedness can negatively affect student motivation and psychological well-being (Puspitasari & Sulastri, 2022). Finally, the Technology Acceptance Model (TAM) developed by Davis (1989) explains how perceived usefulness and perceived ease of use

influence technology adoption behaviors, with research demonstrating that perceived usefulness has the strongest impact on usage intention, while ease of use indirectly affects perceived usefulness (Oliveira Neto et al., 2024; Davis, 1989), and in the context of education in developing regions, factors such as digital literacy, facilitating conditions, social influence, technology anxiety, and familiarity with technology during the pandemic significantly affect technology adoption (Pratiwi et al., 2025).

RESEARCH METHODS

This study employs a descriptive qualitative approach to investigate the impact of face-to-face learning systems on psychological well-being and access disparities among second-year students at SMPK Santa Maria Assumpta Kupang (Moleong, 2010; Creswell, 2016), wherein the qualitative approach was selected for its appropriateness in examining complex social phenomena, understanding participants' experiences and perspectives, and exploring nuanced relationships between educational practices and psychological outcomes (Denzin & Lincoln, 2018).

The research was conducted at SMPK Santa Maria Assumpta, located in Kupang City, East Nusa Tenggara Province, Indonesia, with location selection based on three primary considerations: (a) documented challenges in implementing effective learning systems in the region, (b) the diverse socioeconomic backgrounds of students, and (c) the willingness of school administrators and stakeholders to participate in the research. The research population comprised all second-year students at SMPK Santa Maria Assumpta Kupang, totaling 87 students across three classrooms, as well as teachers, administrative staff, and parents, while sampling was conducted using purposive sampling techniques to select participants capable of providing rich and relevant information about the research phenomena (Patton, 2015; Bell, Bryman, & Harley, 2022). The sample details included 30 second-year students with criteria of diverse academic achievement levels, varied home environments, and willingness to participate; 10 teachers representing different subjects and teaching experiences; 15 parents or guardians with diverse economic and educational backgrounds; and 3 school administrators as key personnel with knowledge of institutional operations.

Data in this study were collected through multiple methods to ensure comprehensive coverage and triangulation (Denzin, 1989; Bryman, 2004), beginning with semi-structured in-depth interviews conducted with students, teachers, parents, and school administrators to explore their experiences, perceptions, and challenges related to learning systems (Kvale & Brinkmann, 2015), as well as participant observation of classroom activities in both face-to-face and online sessions to document learning processes, engagement patterns, and environmental factors (Spradley, 2016).

Additionally, structured questionnaires were administered to students to assess psychological well-being indicators, technology access, and perceptions of learning effectiveness (Creswell, 2016), while document analysis was conducted on school records, curriculum documents, and institutional policies to understand the educational context and resources (Bowen, 2009), and focus group discussions (FGDs) were conducted with students and teachers separately to facilitate discussion of collective experiences and challenges (Morgan, 1997; Krueger & Casey, 2015). To ensure the trustworthiness of findings, validity and reliability measures were implemented through triangulation using multiple data sources and methods to cross-validate findings (Guion, Diehl, & McDonald, 2011; Denzin, 1989), member checking whereby participants reviewed interview transcripts and findings summaries to confirm accuracy (Lincoln & Guba, 1985; Yanow, 2020), prolonged engagement by spending sufficient time in the field to build trust and understand the context (Creswell & Poth, 2018), and peer debriefing through consultations with colleagues to review the analytical process (Lincoln & Guba, 1985).

Data analysis was conducted using thematic analysis techniques encompassing six phases: familiarization with data through interview transcription, repeated reading of field notes, and review of survey responses; generation of initial codes by identifying meaningful data segments relevant to the research questions; searching for themes by organizing codes into potential themes related to

psychological well-being and access disparities; reviewing themes to refine coherence and relevance; defining and naming themes by developing clear descriptions for each theme; and producing the report by integrating themes into a coherent narrative supported by evidence (Braun & Clarke, 2006; 2022). Thematic analysis was selected for offering a flexible and accessible approach to analyzing qualitative data, enabling researchers to systematically identify, analyze, and report patterns (themes) within the data (Braun & Clarke, 2006).

RESULTS AND DISCUSSION

Findings

1. Student Access to and Use of Technology

The research findings reveal that students at SMPK Santa Maria Assumpta generally have access to basic digital devices, with the majority possessing Android smartphones. However, access to these devices is not evenly distributed among students. Based on survey results, 23% of students reported having to share devices with other family members or lacking consistent access to the technology necessary for participating in online learning. This finding aligns with Setyanti et al. (2025), who demonstrated that the digital divide in Indonesia's 3T regions is not limited to infrastructure access (first-level digital divide) but also encompasses differences in digital literacy and the ability to effectively utilize technology (second-level digital divide). This condition is exacerbated by the reality that most families in Kupang City depend on the agricultural and fisheries sectors as their primary livelihoods, such that expenditures on educational technology are often necessarily sacrificed for the fulfillment of basic needs (Muzayanah et al., 2025). Table 4.1 below presents data concerning the technology access available to students:

Table 4.1 Student Technology Access

Technology Item	Students with Access (%)	Comments
Smartphone	83%	Often shared with family members
Laptop/Computer	18%	Primarily owned by economically advantaged families
Home Internet Access	52%	Quality varies significantly
Data Package Adequacy	41%	Often insufficient for full participation

The research findings further indicate that students tend to access digital learning materials through social media platforms such as TikTok, Facebook, Instagram, and WhatsApp. This finding indicates a preference for applications that are easily accessible and require lower bandwidth compared to specialized educational platforms requiring higher internet speeds. This phenomenon reflects the adaptations students make to existing infrastructural limitations, as explained by self-determination theory, which posits that individuals tend to seek the most efficient means of fulfilling their competency needs within existing constraints (Puspitasari & Sulastri, 2022).

2. Student Preferences for Learning Modalities

The majority of students expressed strong preferences for face-to-face learning compared to online learning. Several primary reasons articulated by students include: (a) internet connectivity issues that frequently disrupt the learning process, (b) difficulty concentrating during online learning sessions, (c) limited interaction with peers and teachers, (d) reduced engagement compared to direct instruction, and (e) technical barriers in using virtual platforms such as Zoom, Google Meet, and Skype. This finding supports the statement by the Deputy Minister of Primary and Secondary Education, Atip Latipulhayat, affirming that digitalization of education is not intended to replace the role of teachers but rather serves as a tool that enriches the learning process, as education is fundamentally a process of humanization

that cannot be fully replaced by technology (Kemendikdasmen, 2025). Nevertheless, students also recognize that digitalization offers future opportunities in education to make learning more engaging, more comprehensible, and more accessible; however, current implementation challenges continue to limit the realization of these benefits.

3. Indicators of Student Psychological Well-being

The assessment of student psychological well-being revealed concerning patterns among students. Table 4.2 below presents data regarding psychological well-being indicators experienced by students:

Table 4.2 Indicators of Psychological Well-being Among Students

Indicator	Frequently Experienced (%)	Sometimes Experienced (%)	Rarely Experienced (%)
Anxiety about learning	28%	45%	27%
Difficulty concentrating	35%	40%	25%
Frustration with technology	42%	38%	20%
Feelings of social isolation	30%	42%	28%
Worry about academic performance	38%	44%	18%

The data above demonstrates that frustration with technology is the most frequently experienced indicator among students (42%), followed by worry about academic performance (38%) and difficulty concentrating (35%). These findings align with Cao et al. (2020), who demonstrated that online learning can contribute to increased anxiety levels among students, particularly when accompanied by technical difficulties and limited social interaction. Furthermore, Muzayanah et al. (2025) found that 13.29% of students experienced high stress and 41.82% experienced moderate stress during distance learning. The Indonesian Child Protection Commission (KPAI) also recorded that 79.9% of children complained about online learning processes conducted without interaction, which caused them stress (Muzayanah et al., 2025). This compromised psychological well-being is particularly concerning given that students in the 12-14 age range are in the developmental stage of adolescence, characterized by a transition from primary family focus to greater emphasis on social interactions with peers, such that the social isolation inherent in online learning can disrupt their normal developmental processes (Dewi, 2022; Fardila et al., 2024).

4. Teacher Experiences and Challenges

Teacher Technology Proficiency

The research findings indicate significant variation in the level of technology proficiency among teachers. Junior teachers generally demonstrated higher levels of comfort and competence in using digital tools compared to senior teachers. Several senior teachers even expressed reluctance to lead online learning and tended to delegate such responsibilities to younger colleagues whom they perceived as having better understanding of curriculum content and available instructional materials. This condition reflects the findings of Ertmer and Ottenbreit-Leftwich (2015), who identified that technology adoption by teachers involves not merely technical skills but also beliefs, attitudes, and organizational support. Research on urban and rural teacher perspectives on Indonesian educational reform also reveals that teachers in remote areas often struggle with limited resources and unclear policy directives (Burhan, 2025). This is compounded by the fact that approximately 20% of teachers in remote areas are reported absent, a factor associated with student absenteeism, dropout rates, and poor academic performance (Burhan, 2025).

Teacher Motivation and Working Conditions

Teacher motivation in performing duties, including preparation and delivery of online learning, is substantially influenced by the level of compensation they receive. The significant gap between honorary teacher honoraria (IDR 400,000 to IDR 950,000 per month) and the regional minimum wage has diminished educators' enthusiasm for undertaking additional tasks. This finding is consistent with Rahayu and Rindaningsih (2025), who demonstrated that adequate compensation contributes significantly to the work motivation of non-permanent teachers, which in turn positively impacts their performance. Furthermore, Hardianto et al. (2025) found that recognition and commitment have direct and significant effects on transformational leadership, which subsequently serves as a key mediating variable in enhancing teacher job satisfaction. This condition aligns with Fardila et al. (2024) and Faslah (2024) concerning the relationship between resource allocation, teacher compensation, and educational outcomes.

Pedagogical Adaptation

Although teachers generally deliver instruction effectively in accordance with the applicable curriculum, adapting content for online delivery presents distinct challenges. Teachers identified several urgent needs: (a) training in designing engaging online content, (b) strategies for maintaining student engagement in virtual settings, (c) methods for effectively assessing student learning in online contexts, and (d) techniques for managing classroom behavior in virtual spaces. These needs indicate that digital transformation in education requires a holistic approach that provides not only infrastructure but also ongoing teacher capacity development (Selwyn, 2016; Weri et al., 2025).

5. Parental Involvement and Challenges

Economic Constraints

Many parents expressed difficulty in purchasing internet data packages to support their children's education. With household incomes primarily derived from the agricultural or fisheries sectors, expenditure on data packages represents a significant financial burden. Parents identified expenditure priorities in the following order: (1) food and basic necessities, (2) school supplies (books, uniforms), and (3) technology and data access. Muzayanah et al. (2025) demonstrated that students residing in rural areas tend to experience higher stress levels compared to their urban counterparts, as better economic conditions in urban areas can provide adequate infrastructure, sanitation, and educational facilities. This aligns with Cao et al. (2020), who identified that socioeconomic factors play a significant role in student anxiety levels during online learning.

Parental Digital Literacy

Limited technological proficiency among parents constitutes a significant barrier to supporting children's online learning. Parents reported difficulties in: (a) operating smartphones or computers for educational purposes, (b) assisting children with technical problems, (c) understanding online learning content and requirements, and (d) monitoring children's digital activities. These findings indicate the need for digital literacy programs for parents, as recommended by various studies on education in the digital era (Dewi, 2022; Weri et al., 2025).

Parental Stress and Anxiety

Parents reported elevated levels of stress and anxiety related to their children's online learning, particularly concerning: (a) inability to meet technological requirements, (b) concerns about children falling behind academically, (c) difficulty balancing work and learning supervision, and (d) frustration with technical issues beyond their control. This psychological pressure reflects dimensions of psychological well-being that include the ability to manage one's environment and build positive relationships with others (Ryff, 1989; ScienceDirect, 2024).

6. Infrastructure and Institutional Challenges

Technological Infrastructure

The school has made progress in integrating technology, such as providing smartboards and some basic digital infrastructure. However, significant limitations persist, as presented in Table 4.3 below:

Table 4.3 Infrastructure Assessment

Infrastructure Component	Status	Challenges
Power supply	Inconsistent	Frequent outages disrupt learning
Internet connection	Limited	Poor signal quality, insufficient bandwidth
Smartboards	Available	Insufficient quantity, maintenance challenges
LCD Projectors	Limited quantity	Additional units required
Teacher resources	Inadequate	Limited access to digital teaching materials
Student technology	Varied	Digital divide among students

These infrastructural limitations align with Koesnandar (2023) and Syahmahita & Ayuni (2022) concerning educational challenges in Indonesia's 3T regions. The government, through the Ministry of Primary and Secondary Education, has launched the Digitalization of Learning Strengthening Program, which not only distributes advanced devices such as Interactive Flat Panels (IFP), laptops, and learning content media but also aims to build a comprehensive and sustainable digital learning ecosystem through technical guidance delivered both offline and online (Kemendikdasmen, 2025). However, these efforts still face implementation challenges, particularly in remote areas.

Curriculum Implementation

The implementation of the Merdeka Curriculum, which emphasizes technological proficiency, faces significant challenges at SMPK Santa Maria Assumpta. Although the curriculum provides a framework for digital education, the gap between curriculum expectations and available resources creates implementation difficulties. Widyaningtyas et al. (2025) demonstrated significant improvements in digital well-being and student self-regulation through Merdeka Curriculum implementation; however, this requires adequate integration of digital literacy and self-regulation training.

7. Access Disparities

This research identified various dimensions of access disparities experienced by students, as presented in Table 4.4 below:

Table 4.4 Access Disparities Among Students

Dimension	Disparity Description
Device access	Disparity between students with exclusive device access and those sharing devices
Internet connectivity	Variation in quality and reliability of internet access
Data affordability	Economic constraints limiting data package purchases
Parental support	Differences in parents' ability to provide technical and academic support
Digital literacy	Variation in student proficiency with digital learning tools
School resources	Disparity between ideal technology provision and actual availability

These access disparity dimensions reflect Nakula (2024) and Putra, Aziz, & Aini (2025), who identified that the digital divide in education manifests in various forms, including device access, connectivity, digital literacy, and the ability to effectively utilize technology. Setyanti et al. (2025) found that digital adoption through internet access and digital device ownership contributes to the sustainability of children's education, and when households in 3T areas have internet connectivity and digital devices equivalent to those in non-3T areas, the likelihood of their children attending school becomes equally substantial.

Discussion

1. The Complex Relationship Between Learning Systems and Student Psychological Well-being

The findings of this research elucidate the complex relationship between learning system implementation and student psychological well-being. Students' experiences with online learning are shaped by various interrelated factors, including technology access, digital proficiency, pedagogical quality, environmental conditions, and individual psychological characteristics. Consistent with Gorichanaz (2022) and Dewi (2022), this study found that students experience frustration and anxiety when technological barriers impede the learning process. Prolonged waiting times for teachers to appear on applications, connectivity disruptions, and difficulties accessing content all contribute to negative psychological outcomes. These findings underscore the importance of addressing technical and infrastructural factors in promoting student well-being.

Psychological well-being, as defined by Ryff (1989), encompasses six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (ScienceDirect, 2024). In the context of this research, the dimensions of positive relations with others and environmental mastery appear most affected by online learning, given the limitations of social interaction and difficulties in managing digital learning environments. Developmental considerations are also highly relevant, given that second-year students (ages 12-14) are at a developmental stage characterized by increasing emphasis on peer relationships and social belonging. The social isolation inherent in online learning can have particular negative consequences for this age group, as it disrupts normal developmental processes that should occur through direct social interaction (Muzayanah et al., 2025; Puspitasari & Sulastri, 2022).

2. Systemic Factors Contributing to Access Disparities

The access disparities documented in this research reflect broader systemic inequalities in the distribution of educational resources in Indonesia. The challenges identified at SMPK Santa Maria Assumpta align with findings from other studies on educational disparities in the 3T regions (Koesnandar, 2023; Syahmahita & Ayuni, 2022; Pakaya et al., 2023). Several systemic factors contributing to access disparities include:

Economic Factors: The socioeconomic profile of families in Kupang City, with many depending on agriculture and fisheries for their livelihoods, creates a context where expenditures on educational technology must compete with basic survival needs. This aligns with culturally relevant pedagogy perspectives emphasizing that educational approaches must consider the material conditions of students' lives (Weri et al., 2025). Setyanti et al. (2025) demonstrated that digital adoption has the potential to enhance educational access in 3T regions; however, this requires targeted and sustained policy interventions.

Teacher Compensation: The significant disparity in teacher compensation between local and central regions creates systemic demotivation affecting educational quality. This finding is consistent with Fardila et al. (2024) and Faslah (2024) concerning the relationship between resource allocation and educational outcomes. Burhan (2025) also found that teachers in remote areas struggle with limited resources and unclear policy directives, affecting their motivation and performance.

Infrastructure: The combination of unreliable electricity, poor internet connectivity, and limited devices creates a challenging environment for implementing digital learning. These infrastructure issues are not merely technical but have profound pedagogical and psychological implications. The Digitalization of Learning Strengthening Program launched by the Ministry of Primary and Secondary Education aims to address these challenges through device distribution and technical guidance; however, these efforts still require sustained commitment and coordination (Kemendikdasmen, 2025).

3. The Role of Face-to-Face Learning Amidst Digitalization

Despite the increasing emphasis on digital learning, face-to-face instruction remains a preferred and effective modality at SMPK Santa Maria Assumpta. Several factors explain this preference: (1) reliability—face-to-face instruction is less vulnerable to technical failures and disruptions; (2) engagement—direct interaction facilitates engagement, behavior management, and responsive teaching; (3) social connection—face-to-face learning supports peer interaction and social development; (4) accessibility—it does not require technology that may be unavailable or unaffordable; and (5) pedagogical quality—teachers can employ a wider range of instructional strategies directly.

This finding supports the Deputy Minister of Primary and Secondary Education's statement that digitalization of education is not intended to replace the role of teachers but rather serves as a tool that enriches the learning process, as education is a process of humanization that cannot be replaced by technology (Kemendikdasmen, 2025). A balanced approach that strengthens face-to-face instruction while strategically integrating technology where it can add value aligns with blended learning principles and the recognition that different contexts require different educational solutions (Weri et al., 2025).

4. Critical Incidents and Implications for Educational Policy

This research reveals concerning incidents that underscore the severity of challenges facing education in the region. Reports of students experiencing depression severe enough to contemplate suicide due to educational pressures—including inability to afford textbooks or meet online learning requirements—highlight the urgent need for intervention. These extreme cases, while not statistically prevalent, illuminate the profound psychological impact of educational disparities and the importance of comprehensive support systems for students and families facing economic and educational challenges.

Cao et al. (2020), involving 7,143 students, demonstrated that 0.9% experienced severe anxiety, 2.7% experienced moderate anxiety, and 21.3% experienced mild anxiety during online learning. Muzayanah et al. (2025) also revealed that 13% of students experience symptoms of mental difficulties ranging from mild to severe depression, with 93% of students exhibiting depressive symptoms aged 14-18 years. These findings affirm that student psychological well-being must be a priority in educational policy formulation, particularly in regions with infrastructural and resource limitations.

5. Recommended Interventions

Based on the research findings, several interventions are recommended to address the identified challenges:

Infrastructure Development: Collaboration with local authorities to address power stability issues through alternative power solutions such as solar panels; investigation of connectivity options appropriate to the local context such as community Wi-Fi centers, mobile hotspot solutions, or learning platforms capable of operating offline; and initiatives to provide loaner devices or establish computer centers accessible to students without personal technology.

Capacity Building: Professional development programs focusing on digital literacy, online pedagogy, and leveraging technology in resource-constrained environments for teachers; digital literacy training for students to enhance their ability to navigate online learning platforms; and programs to develop parental digital literacy and enable them to better support children's learning.

Economic Support: Advocacy for teacher salary improvements to enhance motivation and retention; and provision of data packages or educational technology subsidies for economically disadvantaged students.

Psychological Support: Establishment of accessible counseling services and mental health support for students experiencing learning-related stress and anxiety; and peer support programs to encourage social connection and emotional support among students.

Curriculum Adaptation: Development of learning resources appropriate to the local context, considering language, cultural relevance, and available resources; and implementation of learning approaches that accommodate diverse levels of technology access.

CONCLUSION

This research examined the impact of face-to-face learning systems on the psychological well-being and access disparities of second-year students at SMPK Santa Maria Assumpta Kupang in the digital era. The findings reveal a complex educational landscape shaped by infrastructural limitations, economic constraints, psychological challenges, and systemic inequalities.

1. Psychological Well-being: Students experience significant anxiety, stress, and frustration related to learning in the digital era, exacerbated by technological barriers, social isolation, and economic pressures. These psychological challenges are particularly pronounced among adolescents, for whom peer relationships and social connections are developmentally critical.
2. Access Disparities: Substantial disparities exist in access to technology, internet connectivity, and digital learning resources among students. These disparities reflect broader socioeconomic inequalities and contribute to differential educational outcomes.
3. Institutional Challenges: The school faces multiple challenges in implementing effective learning systems, including inadequate technological infrastructure, limited teacher digital proficiency, low teacher motivation due to compensation issues, and insufficient resources for student support.
4. Preference for Face-to-Face Learning: Despite the push toward digitalization, face-to-face instruction remains a preferred and effective modality in the local context. Factors contributing to this preference include reliability, engagement, social connection, accessibility, and pedagogical quality.

Systemic Factors: The challenges documented in this research reflect broader systemic issues related to educational resource allocation, teacher compensation, infrastructure development, and socioeconomic conditions in underserved regions.

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