IN HARMONIA SCIENTIA: BALANCING DIGITAL PEDAGOGIES AND CHARACTER DEVELOPMENT FOR PUPIL MOTIVATION IN AN INDONESIAN PRIMARY SCHOOL

MERY GUNAWAN
IKIP Widya Darma

AMIATUN NURYANA
IKIP Widya Darma

Abstract: This case study explores how SD Kusuma Bangsa in Palembang integrated innovative pedagogical strategies to sustain pupil motivation during curriculum reform. Using a mixed-method design, data were drawn from institutional records, classroom observations, and surveys of students, teachers, and parents. Findings reveal that interactive digital applications, structured physical education, disciplined device management, and home-school collaboration improved participation, literacy, and attendance. These practices were embedded in the Kurikulum Satuan Pendidikan (KSP) 2025/2026, aligning with the Profil Pelajar Pancasila. Grounded in Maslow's Hierarchy of Needs and Self-Determination Theory, the study illustrates how autonomy, competence, and relatedness were fostered through digital exploration, structured skill-building, and collaborative practices. While promising, the findings reflect a single well-resourced institution; future research should extend this model to diverse contexts to test broader applicability.

Keywords: Intrinsic Motivation, Digital Pedagogies, Self-Determination Theory, Curriculum Reform, Profil Pelajar Pancasila, Self-Efficacy, Digital Literacy.

INTRODUCTION

SD Kusuma Bangsa in Palembang has long positioned itself as a forward-looking primary school, blending contemporary digital systems with the structural mandates of Indonesia's Kurikulum Merdeka. Since earning an official "A" accreditation in 2004, the institution has consistently updated its pedagogical approaches to ensure that daily instruction remains stimulating, active, and relevant. Guided by the motto In Harmonia Scientia—the pursuit of knowledge in balanced harmony—the school seeks to cultivate learners who are both technologically literate and ethically grounded.

This vision resonates with global calls for digital literacy and self-efficacy as essential competencies in 21st-century education. By embedding both technological

and moral dimensions into its pedagogy, SD Kusuma Bangsa demonstrates how curriculum reform can be operationalized in ways that foster intrinsic motivation and resilience. The emphasis on holistic character development aligns closely with the Profil Pelajar Pancasila, which has been empirically linked to motivation and independence in learning. This balance directly reflects the classic evolution of educational thought, which often shifts between three foundational ideals: Harmonia (the quest for moral wholeness), Scientia (the focus on scientific and technical mastery), and Economia (the drive for practical, real-world readiness). Rather than treating these philosophies as conflicting forces, the school acts as a living laboratory where ethical grounding, tech skill, and practical excellence grow together.

The study is anchored in two foundational perspectives from educational psychology: Maslow's Hierarchy of Needs and Self-Determination Theory. Maslow's framework reminds us that learners must first experience physical comfort and safety before they can fully engage in academic tasks. Once these needs are met, belonging and esteem become critical, fostering confidence, persistence, and resilience. At SD Kusuma Bangsa, these dimensions are addressed through a supportive school climate, structured routines, and recognition of student achievements.

Self-Determination Theory (Deci & Ryan, 2017) highlights three universal psychological needs—autonomy, competence, and relatedness—which guided both the design and analysis of this study. Autonomy was fostered through interactive digital tools, competence through structured sports and literacy initiatives, and relatedness through collaborative classroom practices and home-school partnerships. Together, Maslow's hierarchy and Self-Determination Theory provide a robust lens for interpreting how innovative practices at SD Kusuma Bangsa sustain pupil motivation. They situate the case study within broader psychological debates, ensuring that the findings are not only locally relevant but also aligned with global understandings of how motivation develops in educational contexts.

RESEARCH METHOD

Research Design and Data Collection Process

This study employed a mixed-method case study design, combining qualitative and quantitative approaches to capture both depth and breadth of educational practices at SD Kusuma Bangsa. The qualitative strand, through classroom observations and stakeholder feedback, provided rich insights into the lived experiences of teachers, students, and parents. The quantitative strand, via

structured surveys, offered measurable evidence of motivation and engagement trends.

To ensure rigor, data collection combined short-term targeted observation windows with long-term monitoring. While macro policy shifts, enrolment histories, and digital institutional records—including automated check-in logs—were monitored longitudinally from 2019 to 2026, day-to-day classroom interactions were captured during a concentrated, one-month observational field phase. These classroom observations were logged using a structured protocol developed by the research team. Observations were conducted directly by homeroom teachers and subject teachers across different sessions. The primary focus remained on student involvement and active work processes during classroom activities, specifically capturing participation frequency, attentiveness, peer collaboration, and task completion. A standardized assessment rubric helped control for subjectivity and ensured consistency across different classrooms.

Research Cohort and Participant Sampling

The sampling strategy was designed to maintain representativeness and credibility across the school community. Stratified random sampling was applied to 105 students out of a total population of 754, guaranteeing equal representation across grades 1–6 and preventing age-related bias.

Teachers (n=6) were selected via criterion-based purposive sampling. This cohort comprised one homeroom teacher per grade level who was directly responsible for the 105 sampled students. This targeted approach ensured that the educators closest to the operational changes provided the baseline data. Parents (n=20) were selected using purposive sampling, focusing on individuals actively engaged in school committees or activities to secure meaningful, detailed insights into home learning routines and technology integration.

Instruments and Survey Administration

Three custom-designed paper-based instruments were developed for teachers, parents, and students. Each survey contained five items tailored to its cohort, using Likert or frequency scales

to measure engagement, motivation, and support structures.

To maximize validity, the instruments were piloted with small groups to refine clarity and wording. Internal consistency was established using Cronbach's Alpha α

- Teacher survey: α= 0.84
- Parent survey: α= 0.81
- Student survey: α= 0.79

These values indicate strong reliability, exceeding the conventional 0.70 social science threshold. Item-level checks showed that competence items yielded the most consistent responses, while autonomy items displayed slightly higher variation. Although factor analysis was restricted due to sample size limitations, the item-level internal consistency provides sufficient evidence that the underlying motivational dimensions were measured dependably. Neutral administration protocols such as students completing surveys under neutral research observation and parents responding during standard parent-teacher association meetings minimized external peer influence and social desirability bias.

Analysis Method and Validity Measures

Quantitative data were processed using descriptive statistics, including means (M) and standard deviations (SD), supplemented by inferential tests. An ANOVA was conducted to compare central tendency shifts across the three cohorts, revealing no statistically significant differences ($p > 0.05$). This statistical parity indicates a broad, uniform consensus among teachers, parents, and students regarding the school's educational climate. To explore underlying dynamics, a multiple linear regression analysis was applied, which revealed that parental involvement acted as a modest but significant predictor of student motivation scores ($\beta = 0.27$, $p < 0.05$).

Qualitative data were analysed using thematic coding guided by Self-Determination Theory. A deductive framework built around autonomy, competence, and relatedness structured the primary analysis, while inductive coding allowed unexpected sub-themes to emerge, such as a strong parental focus on home literacy habits. Coding was executed independently by two researchers, yielding an intercoder reliability agreement score above 85%.

Validity was reinforced through triangulation across cohorts, member-checking sessions with school stakeholders, peer review by faculty specialists, and longitudinal consistency checks (2019–2026). Institutional records, including enrolment histories and grade archives, were cross-referenced to corroborate survey findings.

RESULTS AND DISCUSSION

Empirical Results

a. Quantitative Data Analysis

The descriptive metrics across all three surveyed cohorts demonstrate a uniform baseline of positive consensus regarding the school's structural updates. The overall aggregate metrics for the cohorts demonstrated sustained agreement across the evaluation metrics:

- Teachers: M = 3.9, SD = 0.42
- Parents: M = 4.0, SD = 0.38
- Students: M = 3.8, SD = 0.45

To isolate specific motivational factors, individual survey responses were disaggregated into the core dimensions specified by Self-Determination Theory:

Table 1. Result Motivational Dimension

Motivational Dimension	Teacher Mean	Parent Mean	Student Mean
Autonomy	3.8	3.9	3.7
Competence	4.0	4.1	3.9
Relatedness	3.9	4.0	3.8

b. Qualitative Data Analysis

Triangulating these metrics with raw stakeholder testimony reveals the psychological mechanisms behind the high competence and autonomy scores. Rather than expressing generic satisfaction, participants pointed to specific operational changes within the school environment:

"*Students are far more confident presenting ideas when they can use interactive panels. It changes the classroom dynamic*." — Teacher Participant

"*My child now reads independently at home because of the digital library. Before, it was difficult to motivate him*." — Parent Participant

"*I feel braver when I can show my work on the big screen. It makes me proud*." — Student Participant

Beyond classroom software, automated systems tracking daily routines sparked unexpected behaviour shifts. Students frequently brought up the school's morning check-in gate during focus

groups, showing that passive school infrastructure can influence student habits long before the first bell rings.

Discussion

a. Innovative Learning Practices and Disciplinary Protocols

Teachers and parents consistently observed that students became more confident and engaged when using interactive panels and digital libraries. Improvements in the school's digital ecosystem underscore how targeted technology deployment drives student interest. This trend echoes Nugroho (2021), who found that interactive tools elevate curiosity and lesson compliance when embedded in daily tasks.

Yet, these digital pathways succeed only because they are balanced by strict protocols. The school's "no-gadget" threshold ensures that technology functions as a learning aid rather than a distraction. This principle reflects Zainuddin's (2020) global review, which showed that motivation spikes only when digital innovation is paired with clear institutional discipline. SD Kusuma Bangsa demonstrates this balance, aligning with Alé and Arancibia's (2025) findings that structured exposure fosters resilience and autonomy.

A fascinating example of this tech-discipline dynamic is the school's automated Radio - Frequency Identification (RFID) attendance system, which logs when students arrive and leave. While it started as a simple, hands-off way for the office to track attendance, it has quietly turned into an exciting daily game for the children. Students have begun trying to outdo each other to see who can tap in first, pushing themselves to get to school earlier than their friends. This friendly morning race shows how a small spark can grow into true intrinsic motivation. What started as an external school rule has turned into a self-driven habit of punctuality and personal responsibility—a perfect example of how a tracking tool can help build a child's inner sense of order and character.

b. Holistic Curriculum Integration and Achievements

Digital innovation is complemented by active physical education programs, including swimming and sports courts for basketball, tennis,

volleyball, and badminton. These modules build teamwork, discipline, and health, linking directly to Indonesia's Kurikulum Merdeka and the Profil Pelajar Pancasila.

As Suryani (2022) notes, student-centered learning thrives when tied to national character metrics. By synthesizing digital agility with values-based physical training, the school transforms policy into classroom habits. Outcomes are evident in academic Olympiad achievements and sports medals, alongside international collaborations such as hosting German student cohorts and engaging with the Australian Ambassador.

c. Statistical Nuances and Shared Institutional Culture

While ANOVA results showed uniform positivity across cohorts, regression analysis revealed parental involvement as a significant predictor of student motivation ($\beta = 0.27$, $p < 0.05$). This highlights the dual role of institutional frameworks and home reinforcement. Maslow's framework and Self-Determination Theory converge here: the school secures safety and structure, while parental connection unlocks higher tiers of self-actualization.

d. Philosophical Frameworks in Action

The way SD Kusuma Bangsa balances its daily life brings to light Jan Hábl's ideas on the classic motifs of education. The school's deep commitment to building character, celebrating good sportsmanship, and keeping technology safe and structured is a modern-day expression of Harmonia—helping children find their footing within a healthy moral framework. At the same time, the focus on data, tracking competence, and using sharp interactive tools brings Scientia alive through empirical, structured methods. Finally, by giving kids a strong foundation in digital literacy and opening doors to global events and partnerships, the school fulfils the goals of Economia, ensuring students are fully prepared to step confidently into a highly competitive, modern world.

e. Limitations and Future Research Frameworks

Although this study offers valuable insights into how innovative practices can sustain pupil motivation, several limitations must be acknowledged to ensure transparency and scholarly rigor. The research was conducted at SD Kusuma Bangsa, a well-resourced urban school with strong IT infrastructure and structured extracurricular programs. While this context provides a model of best practice, it does not necessarily reflect the realities of rural or underfunded schools across Indonesia. The uniqueness of the institution therefore limits the generalizability of the findings.

Another limitation relates to response bias in the survey data. Parents may have felt inclined to present themselves as supportive of school policies, while teachers might have emphasized positive outcomes to align with institutional expectations. This tendency toward social desirability should be considered when interpreting the results, as it may have influenced the overall positivity reflected in the data.

Observer bias also presents a challenge. Classroom observations were conducted internally by homeroom and subject teachers over a one-month period. While their involvement ensured contextual familiarity, it also introduced the possibility that teachers unconsciously highlighted positive behaviours or overlooked difficulties. Future studies could strengthen neutrality by involving external observers or independent evaluators to provide a more balanced perspective.

The study's quantitative scope was further constrained by sample size. Although descriptive statistics, standard deviations, and reliability measures were reported, the sample of 105 students out of a total population of 754 limited statistical power. Inferential tests such as ANOVA and regression were applied, but larger multi-school studies would provide stronger evidence of generalizability and allow for more robust statistical modelling.

Finally, future research should extend this framework to diverse socioeconomic contexts, including rural schools with limited resources. Longitudinal studies beyond the 2026 academic year would also be valuable, as they could determine whether the motivational gains observed here are sustained across different developmental stages. Such extensions would not only test the durability of the findings but also broaden their relevance to Indonesia's wider educational landscape.

CONCLUSION

This study demonstrates that sustaining pupil motivation in Indonesian primary schools requires more than isolated innovations; it calls for a coherent framework in which digital tools, structured physical education, disciplined protocols, and parental collaboration are embedded into curriculum design. At SD Kusuma Bangsa, these practices were formally integrated into the Kurikulum Satuan Pendidikan (KSP) 2025/2026, ensuring alignment with the Profil Pelajar Pancasila and national reform priorities.

The findings confirm that motivation accelerates when technology is carefully balanced with character-building activities and clear boundaries. Interactive panels and digital libraries encouraged autonomy, while sports programs fostered competence and teamwork. Together, these practices reinforced the universality of Self-Determination Theory and echoed global evidence that innovation in education must be supported by structure and discipline to yield genuine psychological value.

Although the study reflects the unique profile of a well-resourced urban school, its contribution remains significant. By showing how innovation can be harmonized with discipline and values, this case study offers a replicable model for schools navigating curriculum reform. It advances the literature by moving beyond single-focus interventions and demonstrating that motivation is maximized through the balanced integration of technology, physical activity, and character education.

One of the most important lessons from this study is that digital tools are most effective when used within clear boundaries. Rather than

allowing devices to dominate classroom life, SD Kusuma Bangsa embedded technology into restrictive usage policies. This ensured that laptops, tablets, and interactive panels functioned strictly as instruments of analysis and learning, rather than becoming sources of distraction. By treating hardware as a controlled aid, the school demonstrated that containment is more valuable than simply increasing the number of devices available.

The success of the automated RFID gate also shows us that technology can inspire students without needing a screen or an app. When simple systems are transparent and visible, they can naturally invite healthy peer motivation and personal drive. Schools should look for these kinds of calm, supportive tech upgrades that reward positive everyday habits and help kids develop a natural sense of responsibility on their own.

Equally significant is the balance between cognitive and physical development. Structured sports modules were not treated as optional extracurricular activities but as an integral part of the curriculum. These programs provided students with somatic relief from the intensity of digital learning, while also fostering teamwork, discipline, and peer connection. In this way, physical education complemented digital literacy, creating a holistic environment where students could thrive both mentally and physically.

The findings also highlight the predictive power of parental involvement. Schools must deliberately connect internal digital resources—such as online libraries and e-learning platforms—to simple, actionable strategies that parents can reinforce at home. When families are encouraged to participate in literacy routines or monitor digital engagement, the motivational gains observed in school are more likely to be sustained. This blueprint for home reinforcement underscores the importance of collaboration between institutions and households..

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