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PLATFORM MEMBACA DIGITAL SEBAGAI SARANA REKAYASA SOSIAL: HUBUNGAN SKOR LITERASI DENGAN PRESTASI AKADEMIK DI SEKOLAH INDONESIA

DIGITAL READING PLATFORMS AS SOCIAL ENGINEERING TOOLS: LITERACY SCORES AND ACADEMIC ACHIEVEMENT IN INDONESIAN SCHOOLS

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ABSTRACT:

Digital reading platforms increasingly function as instruments of deliberate social engineering in education — systematically reshaping students' reading behavior through leveled content, automated comprehension checkpoints, and cumulative performance feedback. This study examines whether such platform-mediated literacy engineering translates into measurable gains on a state-standardized academic measure, using the School Reading System (SRS) and Indonesia's newly introduced Tes Kemampuan Akademik (TKA) language test as its objects of inquiry. A correlational ex post facto design was applied to data from 164 students across elementary ($n = 87$) and secondary ($n = 77$) levels from four private Islamic schools in Indonesia. Pearson correlations revealed modest but statistically significant associations between SRS and TKA scores at the elementary ($r = .27, p = .012$) and secondary ($r = .40, p < .001$) levels, suggesting that platform-based literacy social engineering has a partial, level-dependent effect on academic language outcomes. These findings indicate that digital reading platforms can serve as complementary social engineering tools for literacy development, though their effectiveness falls short of replacing — and should be understood as reinforcing rather than replicating — the competencies measured

by formal standardized assessment. Policy and implementation implications for Indonesian schools are discussed. This study uses a dataset also analyzed in a companion psychometric study submitted separately (Syehani & Kembara, under review).

ABSTRAK:

Platform membaca digital semakin berfungsi sebagai instrumen rekayasa sosial dalam pendidikan dengan membentuk perilaku membaca peserta didik melalui konten berjenjang, pemeriksaan pemahaman otomatis, dan umpan balik kinerja kumulatif. Penelitian ini bertujuan mengkaji apakah rekayasa literasi berbasis platform berhubungan dengan capaian akademik pada instrumen penilaian terstandar pemerintah, menggunakan **School Reading System (SRS)** dan **Tes Kemampuan Akademik (TKA)** bidang bahasa sebagai objek kajian.

Penelitian menggunakan desain **korelasional ex post facto** terhadap data 164 peserta didik yang terdiri atas jenjang sekolah dasar ($n = 87$) dan sekolah menengah ($n = 77$) dari empat sekolah Islam swasta di Indonesia. Analisis korelasi Pearson menunjukkan hubungan positif dan signifikan antara skor SRS dan TKA pada jenjang sekolah dasar ($r = 0,27$; $p = 0,012$) serta sekolah menengah ($r = 0,40$; $p < 0,001$). Hasil tersebut menunjukkan bahwa rekayasa sosial literasi berbasis platform memiliki pengaruh parsial yang bergantung pada jenjang pendidikan terhadap capaian akademik di bidang bahasa.

Temuan ini mengindikasikan bahwa platform membaca digital dapat menjadi sarana pendukung yang efektif dalam pengembangan literasi, meskipun belum dapat menggantikan kompetensi yang diukur melalui asesmen terstandar formal. Dengan demikian, pemanfaatan platform digital lebih tepat diposisikan sebagai penguat proses pembelajaran daripada pengganti evaluasi akademik konvensional. Penelitian ini juga membahas implikasi kebijakan dan implementasi bagi sekolah-sekolah di Indonesia. Dataset yang

Introduction

Education has long been understood as a form of social engineering — a deliberate, systematic effort by institutions to reshape individual behavior and capability in service of broader social goals (Hidayat, Kembara, & Rozak, 2021). In the digital age, this engineering function has been operationalized through technology: digital platforms that structure students' reading habits, reward comprehension, and accumulate behavioral data. These platforms do not merely supplement teaching; they constitute a designed environment intended to produce measurable changes in literacy behavior over time.

Indonesia presents a particularly timely context for examining whether platform-based literacy engineering achieves its intended outcomes. The country's most recent PISA results placed Indonesian 15-year-olds at a mean reading score of 359, compared to an OECD average of 476, with fewer than one in four students reaching at least Level 2 reading proficiency

(OECD, 2023). Against this backdrop, the national government introduced the Tes Kemampuan Akademik (TKA) in 2025 as a standardized, individually reported measure of academic competence in Bahasa Indonesia and mathematics — replacing the previous national examination and creating, for the first time, a large-scale external benchmark against which school-level literacy interventions can be compared (Badan Standar, Kurikulum, dan Asesmen Pendidikan [BSKAP], 2025). The School Reading System (SRS), a digital reading platform independently developed and distributed by the Center for School Improvement (CSI) in Indonesia, exemplifies the platform-as-social-engineering model. Students are presented with graded reading materials calibrated to their competency level; comprehension checkpoints follow each reading; and cumulative scores accumulate over time. The design intention is explicit: to engineer sustained reading engagement and comprehension skill development through repeated, structured exposure to leveled text.

The central question this study asks is whether this form of deliberate literacy social engineering actually works — that is, whether the behavioral patterns it induces in students correspond to improved performance on an external, standardized academic language measure. This question has not previously been addressed in the Indonesian context using TKA as the criterion measure, in part because TKA was only administered nationally for the first time in April 2026. The study is guided by three research questions:

RQ1. Does platform-based literacy social engineering through SRS relate to students' standardized academic language achievement (TKA) at the elementary level?

RQ2. Is the same relationship evident at the secondary level, and does its strength differ across levels?

RQ3. What are the implications for the use of digital reading platforms as social engineering tools in Indonesian schools?

2. Theoretical Framework

2.1 Social Engineering in Education

Social engineering in education refers to the deliberate design and implementation of interventions aimed

at modifying individual behavior and social outcomes through educational means (Hidayat et al., 2021). Unlike incidental learning, social engineering in this sense is intentional, systematic, and goal-directed. Its instruments include curriculum design, assessment structures, and — increasingly — technology-mediated learning environments that embed behavioral nudges into the architecture of educational platforms.

Digital reading platforms exemplify this engineering logic. Their design incorporates three core social engineering mechanisms: (1) behavioral scaffolding through leveled content that matches and gradually extends reading difficulty to the student's demonstrated capacity; (2) immediate reinforcement through comprehension scoring that provides feedback after each reading; and (3) cumulative accountability through score aggregation that renders reading engagement visible and quantifiable over time. Together, these mechanisms constitute a deliberate effort to engineer the reading behavior of individual students toward measurable literacy outcomes.

2.2 Platform-Mediated Literacy and Academic Achievement

The question of whether platform-engineered reading behavior translates into academic achievement is distinct from the question of whether two assessment instruments agree. The former is an effectiveness question: does the intervention work? The latter is a measurement question: do the instruments measure the same thing? Both questions can be addressed with correlational data from the same dataset, but they require different theoretical framing and have different policy implications.

From an effectiveness standpoint, a positive correlation between SRS and TKA scores would suggest that the behavioral patterns cultivated by the platform — sustained reading engagement, text-level comprehension, repeated exposure to varied genres — carry over into the kind of language competence measured by standardized academic testing. A weak or absent correlation, by contrast, would suggest that the platform engineers a form of reading behavior that is largely self-contained, without transferring to externally

assessed academic language proficiency.

Prior international evidence on comparable platforms suggests that the transfer effect is real but bounded: Star Reading, a well-validated adaptive reading platform, reports concurrent associations with state achievement tests in the $r = .70-.82$ range (Forcht & Van Norman, 2024). Whether newer, less-established platforms operating in non-Anglophone contexts achieve comparable transfer has not been systematically studied. The present study contributes to filling this gap.

2.3 Educational Technology and Social Engineering in the Indonesian Context

Indonesia's educational technology landscape has expanded rapidly since the COVID-19 pandemic accelerated digital adoption in schools. Platform-based learning tools, including digital reading systems, are increasingly deployed as instruments of what policymakers frame as educational quality improvement — an explicit social engineering agenda aimed at raising national literacy indicators. The introduction of TKA as an individual-level standardized measure (BSKAP,

2025) creates, for the first time, an external criterion against which to evaluate whether this platform-based engineering agenda achieves its stated goals.

Critically, Indonesia's national literacy data provides a sobering benchmark: PISA 2022 placed Indonesia in the lower quartile of participating countries for reading (OECD, 2023), and TKA's first administration in April 2026 reported a national mean of 60.14 for elementary and 60.83 for secondary students in the Bahasa Indonesia component (Kementerian Pendidikan Dasar dan Menengah [Kemendikdasmen], 2026). Against this baseline, any evidence that platform-based literacy engineering reliably shifts students toward higher academic achievement — even partially — would have significant policy implications for how EdTech adoption decisions are made and evaluated in Indonesian schools.

3. Method

3.1 Research Design

This study employed a non-experimental, ex post facto correlational design using cross-sectional data. The design is appropriate for the effectiveness

question posed here: because SRS adoption preceded TKA administration, and because both instruments were in active use within the same schools, correlational analysis of archival records provides a natural test of whether platform-mediated literacy engineering is associated with academic achievement. No causal claims are made; the study asks whether the association is present, positive, and educationally meaningful in magnitude.

3.2 Participants

The analytic sample comprised 164 students (87 elementary SD/MI level, 77 secondary SMP/MTs level) drawn from four schools operating under two private Islam Terpadu school networks in Indonesia — an Islamic integrated schooling model that combines the national curriculum with religious education in an extended school day. The sample was formed from the intersection of two independent voluntary participation pools: students who actively used SRS during the 2025–2026 academic period, and students who sat for TKA in the April 2026 inaugural cycle. Students without complete records on both instruments

were excluded. Given the voluntary nature of both SRS engagement and TKA participation, the sample likely reflects higher-motivation or higher-engagement students relative to the broader school population; this self-selection dimension is acknowledged as a limitation.

3.3 Instruments

SRS score. The cumulative total of per-reading comprehension results accumulated by each student on the SRS platform across the study period. This score reflects both the volume of reading completed and the accuracy of comprehension responses — a composite that embodies the platform's dual social engineering goals of engagement quantity and comprehension quality.

TKA language score. The individual score on the Bahasa Indonesia component of Indonesia's Tes Kemampuan Akademik, reported on a 0–100 scale. TKA's language component assesses reading comprehension through informational and fictional texts across three competency strands: textual comprehension, inferential comprehension, and evaluation/appreciation (BSKAP,

2025). This represents the state's operationalization of academic language achievement.

3.4 Analysis

Pearson product-moment correlations and Spearman rank correlations were computed between SRS and TKA scores within each educational level and for the combined sample. Fisher z-based 95% confidence intervals were calculated for each coefficient. Level differences were tested using the Fisher z-test for independent correlations. Effect sizes were interpreted using Cohen's (1988) conventions. All analyses were conducted in Python using SciPy; the dataset and analysis script are available from the corresponding author upon reasonable request.

Disclosure: The first author is the founder of CSI, the organization that independently developed SRS. All statistical analyses were executed independently by the second author. A companion psychometric study using the same dataset has been submitted separately (Syehani & Kembara, under review).

4. Results

4.1 Descriptive Statistics

Table 1 presents descriptive statistics by level. Secondary-level students recorded substantially higher mean SRS scores and a wider SRS range than elementary-level students ($M = 153.63$, $SD = 150.58$ vs. $M = 81.10$, $SD = 57.80$), reflecting greater cumulative platform engagement. Both groups' mean TKA scores substantially exceeded the national average of 60.14 (elementary) and 60.83 (secondary) reported for the 2026 TKA cycle (Kemendikdasmen, 2026), confirming that the sample represents a higher-performing subgroup rather than a nationally representative cross-section.

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Table 1
Descriptive Statistics for SRS and TKA Scores by Educational Level

Level	n	M (SRS)	SD (SRS)	M (TKA)	S
Elementary	87	81.10	57.80	75.21	1
Secondary	77	153.63	150.58	78.27	1
Combined	164	115.15	116.85	76.65	1

4.2 SRS-TKA Correlations

Table 2 presents the correlation results. At the elementary level, platform-based literacy engagement (SRS) was positively and significantly associated with standardized academic achievement (TKA), though the effect was weak-to-moderate ($r = .27$, 95% CI [.06, .45], $p = .012$, $R^2 = .072$). At the secondary level, the relationship was moderate and highly significant ($r = .40$, 95% CI [.19, .57], $p < .001$, $R^2 = .160$), suggesting that platform-mediated literacy engineering is associated with approximately 16% of variance in academic language achievement at the secondary level. The combined-sample correlation was $r = .33$ ($p < .001$). Although the

secondary-level coefficient was descriptively larger, Fisher's z-test indicated the level difference was not statistically significant ($z = -0.94$, $p = .349$).

Table 2
Correlations Between SRS (Platform Literacy Engineering) and TKA (Academic Achievement) by Level

Level	r	95% CI	R ²	assesses a broad range of academic language competencies including inferential reasoning and critical evaluation (BSKAP, 2025). That SRS-engineered reading habits account for
Elementary	.27	[.06, .45]	.072	Weak-Moderate effect
Secondary	.40	[.19, .57]	.160	Moderate effect
Combined	.33	[.19, .46]	.111	Moderate effect

5. Discussion

5.1 Platform-Based Literacy Engineering: Partial Effectiveness

The results indicate that SRS, as a social engineering instrument for literacy, has a statistically reliable but modest relationship with national standardized academic achievement. Platform engagement explains 7–16% of TKA language variance depending on level — a finding that should be interpreted neither as a validation of the platform's effectiveness nor as evidence of its futility, but rather as an indication of partial transfer: the literacy behaviors cultivated through SRS are meaningfully, but not

comprehensively, reflected in formal academic language assessment.

This partial effectiveness is consistent with a social engineering interpretation. SRS engineers reading engagement and text-level comprehension through its design architecture; TKA, by contrast,

a meaningful but bounded share of TKA performance is precisely what social engineering theory would predict: the behavioral changes cultivated by a platform are likely to transfer to related, but not identical, competency domains.

5.2 Level Dependency: Secondary Schools as More Receptive Contexts for Literacy Engineering

The descriptively stronger secondary-level association ($r = .40$ vs. $r = .27$) suggests that the social engineering effect of reading platforms may be more pronounced at the secondary level, consistent with Matthew-effect accounts of reading development (Stanovich, 1986) in which accumulated reading volume exerts

increasing influence on language outcomes as students mature. However, the non-significant Fisher z-test cautions against concluding that this is a statistically reliable level difference; an alternative explanation — that the wider variance in SRS scores at the secondary level accounts for the stronger coefficient through a range effect — cannot be excluded.

For practitioners, the implication is not that SRS is more valuable for secondary schools, but that the social engineering of reading behavior through sustained platform engagement may yield more academically visible outcomes among older students. This is consistent with international evidence suggesting that reading-volume effects on language outcomes grow across the school years (Mol & Bus, 2011).

5.3 Policy Implications for EdTech Social Engineering in Indonesian Schools

Three implications emerge for Indonesian educational policy and practice. First, digital reading platforms can function as legitimate components of a school's literacy engineering strategy — but only when their role is understood as supplementary rather

than substitutive. The 7–16% explained variance leaves the majority of TKA language achievement attributable to factors outside the platform's reach, including classroom instruction, teacher quality, and family literacy environments.

Second, adoption decisions for digital reading platforms in Indonesian schools should be grounded in local, empirically tested evidence rather than in international validation data alone. The correlations observed here are considerably weaker than those reported for more established Anglophone platforms ($r = .70-.82$; Forcht & Van Norman, 2024), underscoring that the social engineering effectiveness of a platform may be context-dependent. Indonesian schools should demand context-specific evidence before committing to platform-based literacy engineering as a core strategy.

Third, the substantial gap between sample TKA means (75–78) and national averages (60–61) highlights that the schools in this study are already higher-performing than the national baseline. The social engineering value of SRS may be different — potentially greater — in

lower-performing school contexts where baseline reading engagement is weaker and the incremental behavioral effect of a structured platform may be more pronounced. Future studies should examine SRS effectiveness in more nationally representative samples.

5.4 Limitations

Several limitations qualify these findings. The non-experimental, cross-sectional design cannot establish causal direction: it is possible that students with stronger academic language competence engage more with SRS, rather than SRS engagement driving TKA performance. The sample's self-selected, higher-performing character limits generalizability. Neither SRS nor TKA has documented reliability evidence, limiting how precisely the true relationship can be estimated. The first author's role as founder of the SRS developer constitutes a financial conflict of interest; all analyses were executed independently by the second author, and independent replication is recommended.

6. Conclusion

Digital reading platforms represent a specific and increasingly common form

of social engineering in education: the deliberate shaping of reading behavior through designed technological environments. This study demonstrates that SRS, as one such instrument deployed in Indonesian schools, shows a modest but statistically reliable association with performance on Indonesia's newly introduced national academic ability test. Platform-mediated literacy engineering is not sufficient to account for academic language achievement, but it contributes meaningfully to it — particularly at the secondary level.

For Indonesian schools navigating the dual challenge of low national literacy baselines and a new national assessment framework, this finding suggests that EdTech platforms like SRS can play a constructive supporting role in a school's literacy strategy, provided their effects are understood realistically and their adoption is not used to substitute for the classroom instruction and professional development that account for the majority of academic language outcomes. Evidence-based adoption, local validation, and ongoing monitoring against external benchmarks like TKA are

recommended as minimum conditions for responsible platform-based literacy social engineering in Indonesian schools.

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