Digital Technology Use and its Association with Administrative Efficiency and Work Processes in Malaysian Private Schools

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ABSTRACT

This study examines the associations between digital technology use and two perceived administrative outcomes—administrative efficiency and administrative work processes—in Malaysian private schools. A quantitative cross-sectional survey was conducted using an online questionnaire. Forty responses were received; 37 eligible responses were retained for analysis. All 37 respondents worked in private schools in Kuala Lumpur or Selangor. The questionnaire measured digital technology use with one item, administrative efficiency with six items, and administrative work processes with three items. Descriptive statistics, Cronbach's alpha, and Spearman's rank-order correlations were used. The administrative-efficiency scale showed good internal consistency ($\alpha = .849$), while the work-process scale showed acceptable internal consistency ($\alpha = .769$). Digital technology use was positively associated with administrative efficiency ($\rho = .516$, $p = .001$) and administrative work processes ($\rho = .327$, $p = .048$). These findings indicate that respondents reporting greater technology use also tended to report more favourable administrative outcomes. The findings are relevant to school leaders considering the administrative role of digital systems, particularly in information access, coordination, task completion, and process organization. However, the cross-sectional design does not establish causality. The small non-probability sample, self-reported data, and single-item predictor limit the scope of inference and do not support generalization to all Malaysian private schools. The study therefore offers preliminary context-specific evidence rather than a definitive estimate of the effects of digital transformation. Future studies should use larger and more diverse samples, validated multi-item measures of digital transformation, and objective indicators such as processing time, error rates, and system-use records.

Keywords: digital technology use; administrative efficiency; administrative work processes; private schools; Malaysia

1. INTRODUCTION

Digital transformation has become an important organizational issue as institutions increasingly use digital systems to manage information, coordinate activities, communicate with stakeholders, and deliver services. In education, digital technology is often discussed in relation to teaching and learning; however, its contribution to institutional administration is also significant. School administration involves interconnected activities such as maintaining student and staff records, scheduling, attendance, internal communication, reporting, finance-related procedures, and coordination across departments. Digital systems may support these activities by improving access to information and enabling faster communication, but the presence of technology does not necessarily mean that administrative work has been transformed.

Digital transformation is more than the conversion of paper documents into electronic formats. It involves embedding digital technologies in organizational activities and adapting processes, roles, and practices to create value [19]. In administrative settings, technology may support task completion and information flow, while broader process improvement may require workflow redesign, staff capability, leadership support, and system integration. These distinctions are particularly relevant to private schools, where institutions may differ in resources, management structures, digital infrastructure, and the systems used to support administration.

Malaysia's policy environment has increasingly emphasized digital capability in education, while private schools operate within a diverse institutional landscape. Research on educational digitalization has addressed digital leadership, technology adoption, and administrative applications, but context-specific quantitative evidence concerning the perceived administrative outcomes of digital technology use in Malaysian private schools remains limited. Malaysian studies have explored school leadership competencies and digital maturity [4, 5, 14], while broader research has examined digital transformation and business-process change [7, 13]. These contributions provide a foundation, but they do not fully resolve whether technology use is associated with distinct administrative outcomes in the private-school context.

This study addresses that gap by examining two relationships: digital technology use and administrative efficiency, and digital technology use and administrative work processes. Administrative efficiency is considered through respondents' perceptions of task completion, time, information access and flow, coordination and communication, and workload. Administrative work processes are considered through perceived process simplification, reduction of unnecessary steps, and organization of administrative work. The study is guided by two research questions:

RQ1: Is digital technology use in school administration significantly associated with administrative efficiency in Malaysian private schools?

RQ2: Is digital technology use in school administration significantly associated with administrative work processes in Malaysian private schools?

The corresponding hypotheses are:

H1: Digital technology use in school administration is positively and significantly associated with administrative efficiency.

H2: Digital technology use in school administration is positively and significantly associated with administrative work processes.

The study uses an association-based framing because its cross-sectional design can identify statistical relationships but cannot establish causal effects. Accordingly, the term "digital technology use" is used for the measured predictor. The broader concept of digital transformation provides the study's organizational context, but it was not measured as a multidimensional construct in the administered questionnaire.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Digital technology and organizational transformation

Digital transformation is commonly understood as organizational change enabled by digital technologies. It involves changes in how organizations create value, coordinate activities, use information, and respond to stakeholders. Verhoef et al. [19] emphasize that digital transformation is multidisciplinary and extends beyond the introduction of individual technologies. In process-oriented organizations, digitalization can support automation, integration, standardization, transparency, and process redesign. However, technology may also reproduce existing inefficiencies when digital tools are added without reviewing the underlying workflow.

In schools, administrative technologies can support information management, staff communication, record retrieval, reporting, and coordination. Their effectiveness depends not only on technical availability but also on the extent to which employees use the systems consistently and organizational procedures are aligned with them. Research on business-process management highlights the importance of developing capabilities that connect digital tools with redesigned processes [7, 13].

2.2 Administrative efficiency

Administrative efficiency concerns the ability to complete necessary organizational tasks with appropriate use of time and effort while maintaining accessible and reliable information. In a school environment, efficiency

may be reflected in timely completion of administrative tasks, reduced duplication, easier retrieval of records, improved information flow, and effective coordination among staff. Digital technologies may support these outcomes by centralizing information, facilitating communication, and reducing manual handling. Prior research has discussed the potential of digital systems to improve educational administration and accountability [2, 8, 15].

Nevertheless, perceived efficiency should not be equated with objectively measured time or cost savings. A survey of staff perceptions can indicate whether respondents experience technology as helpful, but it cannot independently verify changes in processing time, error rates, or administrative expenditure. The present study therefore treats administrative efficiency as a perceived outcome measured through six questionnaire items.

2.3 Administrative work processes

Work processes refer to the procedures and sequences through which administrative tasks are completed. Digital transformation may affect processes by simplifying steps, reducing repeated data entry, improving the organization of tasks, and supporting coordination across roles. Process improvement is distinct from task-level efficiency: an individual may complete a task more quickly while the overall procedure remains fragmented or contains unnecessary approvals. Meaningful process transformation therefore requires attention to the design of work, responsibilities, information flows, and integration between systems.

Research on digital administration has considered how information systems and automation can influence administrative workload and organizational routines [16, 21]. In schools, however, the extent of process change may vary according to institutional capacity, system compatibility, staff competence, and management support. This study therefore examines administrative work processes as a separate outcome rather than assuming that efficiency and process organization are identical.

2.4 Technology–Organization–Environment framework

The Technology–Organization–Environment (TOE) framework explains organizational technology adoption and use through three contextual dimensions: technological characteristics, organizational conditions, and the external environment. The technological context includes factors such as system compatibility and infrastructure; the organizational context includes resources, leadership, and employee capabilities; and the environmental context includes external expectations and pressures. Recent work has applied TOE to institutional educational technology adoption [20].

In this study, TOE provides a theoretical lens for understanding why the administrative value of digital technology may differ across schools. It is not, however, an empirically tested three-factor model in the present survey. The questionnaire did not separately measure technological readiness, organizational support, or environmental pressure as predictors. The statistical model is limited to the measured association between digital technology use and each of the two administrative outcomes.

3. METHODOLOGY

3.1 Research design and setting

The study adopted a quantitative, cross-sectional survey design. Data were collected through a structured online questionnaire using Google Forms. The design was selected to examine patterns in respondents' perceptions and test the two specified associations at one point in time. It does not establish temporal order or causality.

The study focused on personnel working in private schools in Kuala Lumpur and Selangor, Malaysia.

3.2 Participants and sampling

A complete sampling frame of eligible personnel across private schools in the two study locations was not available. Participants were therefore recruited through a non-probability approach combining purposive

eligibility screening with convenience-based access. The questionnaire link was shared with personnel at the private Malaysian school where the researcher works as a teacher and was also posted in a Facebook group whose members include teachers and school administrative personnel. Participation was voluntary.

The questionnaire's eligibility criterion was current employment in a private school in Malaysia. Forty submissions were received; 37 respondents met this criterion and completed the substantive questionnaire, while three respondents who answered "no" were excluded. All 37 respondents in the final analytical sample worked in private schools in Kuala Lumpur or Selangor, according to the respondent-location information confirmed for this study.

The final sample of 37 reflects the number of eligible responses obtained through the available recruitment channels; it should not be interpreted as statistically representative of the full population of private-school personnel. The sample size was sufficient for the focused descriptive, reliability, and bivariate analyses undertaken, but it limits statistical power, subgroup analysis, and generalizability. No probability-based inference is claimed.

3.3 Instrument and measurement

The final questionnaire included eligibility and respondent-profile questions, followed by ten substantive statements rated on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The profile questions recorded respondents' positions and years of experience. Digital technology use in administrative activities was measured using one direct item. Administrative efficiency was measured using six items addressing perceived time and task efficiency, access to and flow of information, coordination and communication, and workload. Administrative work processes were measured using three items addressing process simplification, reduction of unnecessary procedural steps, and organization of administrative work.

Digital technology use was represented by a single item in the questionnaire. It is therefore a narrow indicator of perceived use rather than a comprehensive measure of digital transformation. It does not separately capture digital infrastructure, system integration, staff digital competencies, organizational readiness, or the breadth and intensity of technology use. Resource efficiency was discussed in the conceptual literature but was not directly measured in the final questionnaire and was not tested as a separate outcome.

3.4 Data collection, ethics, and analysis

Participation was voluntary. The questionnaire did not require respondents to provide their names or school names, and results are reported in aggregate form. Responses were exported for screening and analysis. Likert responses were coded from 1 to 5. The three ineligible submissions were excluded from all substantive analyses. Administrative-efficiency scores were calculated as the mean of six items for each eligible respondent; administrative-work-process scores were calculated as the mean of three items. Digital technology use remained a single-item measure.

Frequencies and percentages were used to describe respondent characteristics and response patterns. Means and standard deviations summarized the item and composite scores. Cronbach's alpha assessed internal consistency for the two multi-item outcome measures. Spearman's rank-order correlation tested the associations between digital technology use and each outcome. This non-parametric method was selected given the ordinal Likert-type measures and the relatively small analytical sample. Two-sided significance tests were used. Factor analysis and regression modelling were not undertaken because the final instrument and sample did not support those more complex analyses.

4. RESULTS

4.1 Sample characteristics and descriptive results

Of the 40 questionnaire submissions, 37 (92.5%) met the eligibility requirements and were retained, while three (7.5%) were excluded. All 37 eligible respondents worked in private schools in Kuala Lumpur or Selangor. Teachers with administrative responsibilities formed the largest group (18; 48.6%), followed by

administrators (12; 32.4%), principals or vice-principals (6; 16.2%), and one school-based occupational therapist (2.7%).

Regarding professional experience, 14 respondents (37.8%) reported 6–10 years, 10 (27.0%) reported 3–5 years, eight (21.6%) reported less than three years, and five (13.5%) reported more than ten years of experience.

All item means were above the neutral midpoint of 3.00 and ranged from 3.78 to 4.05. The highest mean concerned more organized administrative work processes (M = 4.05, SD = 0.62), followed by more efficient completion of administrative tasks (M = 4.00, SD = 0.62). The digital-technology-use item had a mean of 3.78 (SD = 0.79). The six-item administrative-efficiency composite had a mean of 3.88 (SD = 0.51), while the three-item administrative-work-process composite had a mean of 3.98 (SD = 0.56).

4.2 Reliability

The six-item administrative-efficiency measure showed good internal consistency (Cronbach's $\alpha = .849$). The three-item administrative-work-process measure showed acceptable internal consistency ($\alpha = .769$). No reliability coefficient was calculated for digital technology use because it was measured using a single item. The reliability coefficients support the use of the two respective item composites in the subsequent correlation analyses; they do not establish construct validity.

4.3 Hypothesis testing

Spearman's rank-order correlation indicated a positive, statistically significant association between digital technology use and administrative efficiency ($\rho = .516$, $p = .001$). The magnitude of the association was moderate; respondents reporting greater use of digital technologies tended to report more favourable administrative-efficiency outcomes. H1 was supported.

Digital technology use was also positively associated with administrative work processes ($\rho = .327$, $p = .048$). This association was weaker than the association with administrative efficiency but met the .05 significance threshold. Respondents reporting greater technology use tended to report more favourable views of process simplification and organization. H2 was supported.

Both findings represent statistical associations in this sample. They do not show that technology use caused the reported outcomes, nor do they estimate objective changes in time, cost, error rates, or workload.

Table 1. Response screening

Table 2. Respondent position

Table 3. Respondents' years of experience

Table 4. Descriptive statistics for questionnaire items

Table 5. Reliability analysis

Table 6. Spearman correlation results

Response status	**Frequency**	**Percentage**
Eligible and analysed	37	92.50%
Ineligible / not substantively completed	3	7.50%
Total	40	100.00%
Position	**Frequency**	**Percentage**

Teacher with administrative responsibilities	18		48.60%
Administrator	12		32.40%
Principal / Vice Principal	6		16.20%
School-based occupational therapist	1		2.70%
Total	37		100.00%
Years of experience	**Frequency**		**Percentage**
Less than 3 years	8		21.60%
3–5 years	10		27.00%
6–10 years	14		37.80%
More than 10 years	5		13.50%
Total	37		100.00%
Questionnaire item	**Mean**	**SD**	**Agree / Strongly Agree**
Digital technologies are widely used in administrative activities in my school	3.78	0.79	56.80%
Digital technologies reduce the time required to complete administrative tasks	3.89	0.74	67.60%
Digital systems improve access to administrative information	3.81	0.74	62.20%
Digital systems improve coordination and communication among staff	3.92	0.6	83.80%
Digital technologies reduce administrative workload	3.81	0.62	70.30%
Digital technologies help administrative tasks to be completed more efficiently	4	0.62	81.10%
Digital systems improve the flow of information between staff	3.86	0.75	64.90%
Digital technologies make administrative work processes simpler	3.97	0.69	75.70%
Digital technologies reduce unnecessary steps in administrative procedures	3.92	0.72	70.30%
Digital systems make administrative work processes more organized	4.05	0.62	83.80%
Scale	**Items**	**Cronbach's alpha**	**Interpretation**
Administrative efficiency	6	0.849	Good internal consistency
Administrative work processes	3	0.769	Acceptable internal consistency
All substantive questionnaire items	10	0.895	Not treated as one construct

Hypothesis	Relationship	Spearman's ρ	p-value	Decision
H1	Digital technology use and administrative efficiency	0.516	0.001	Supported
H2	Digital technology use and administrative work processes	0.327	0.048	Supported

5. DISCUSSION

5.1 Digital technology use and administrative efficiency

The positive association between digital technology use and administrative efficiency (ρ = .516, p = .001) suggests that respondents who reported greater use of digital technologies also tended to report more favourable administrative experiences. The outcome composite covered several practical aspects of administration, including task completion, information access and flow, coordination and communication, and workload. The result is consistent with the view that digital technologies can create organizational value when embedded in everyday operations rather than used as isolated tools [19].

In school administration, records and information often move across multiple roles and departments. Digital systems may make information easier to retrieve and share, support communication, and reduce repetitive manual work. The descriptive pattern—particularly the relatively high mean for efficient task completion—accords with this interpretation. Prior research has also discussed the potential of digital applications to support efficiency and accountability in educational administration [2, 8, 15].

The association should nevertheless be interpreted cautiously. Schools with stronger leadership, better infrastructure, clearer procedures, or more digitally capable staff may both use technology more extensively and report higher administrative efficiency. Such organizational conditions were not measured separately in this study. The TOE framework highlights the relevance of technological, organizational, and environmental contexts, but the current data do not permit testing their individual contributions [20].

5.2 Digital technology use and administrative work processes

The second positive association (ρ = .327, p = .048) indicates that greater reported technology use was associated with more favourable perceptions of administrative work processes. This outcome focused on process simplification, fewer unnecessary steps, and more organized administrative work. The finding is relevant because digital transformation should involve not only faster individual tasks but also improvements in how work is structured and coordinated.

The association with work processes was smaller than the association with administrative efficiency. One possible interpretation is that digital tools may improve individual tasks relatively quickly, whereas redesigning an entire administrative process requires coordinated changes to procedures, responsibilities, staff practices, and system integration. This interpretation is consistent with process-management literature, which emphasizes that digitalization creates value when accompanied by organizational and process capabilities [7, 13].

The finding does not demonstrate that the participating schools had fully integrated or automated processes. The questionnaire captured respondents' perceptions through three items and did not audit actual workflows. Further research should combine staff surveys with process mapping and objective indicators to establish whether reported simplification corresponds to measurable reductions in steps, duplication, or processing time.

5.3 Practical implications

For school leaders, the results suggest that digital initiatives should be evaluated against clearly defined administrative outcomes rather than the number of applications purchased or installed. Schools may monitor the time required to complete common administrative requests, frequency of duplicated data entry, number of manual handoffs, response times, record accuracy, and staff perceptions of workload. Training should address not only software operation but also the procedures and responsibilities associated with each system.

Process review should accompany technology implementation. Mapping a procedure from beginning to end can reveal repeated data entry, unnecessary approvals, disconnected applications, and parallel paper-based processes. Clear data ownership, consistent procedures, staff support, and appropriate integration may help technology support rather than complicate administrative work. These are practical recommendations informed by the observed associations and literature; they were not interventions tested in this study.

6. LIMITATIONS AND FUTURE RESEARCH

Several limitations affect interpretation. First, the final analytical sample comprised 37 respondents recruited through non-probability channels. The use of workplace contacts and a Facebook group provided access to personnel with relevant experience, but participants were not randomly selected from a complete sampling frame. Self-selection and coverage bias are possible, and the results cannot be statistically generalized to all Malaysian private schools. The findings describe the participating respondents in Kuala Lumpur and Selangor only.

Second, the cross-sectional design captures perceptions at one point in time and cannot establish temporal order or causality. Third, digital technology use was measured using one questionnaire item. This single-item measure cannot represent the multidimensional nature of digital transformation, including infrastructure, system integration, staff digital competencies, technology adoption intensity, leadership support, and organizational readiness. The internal consistency of the predictor could not be assessed using Cronbach's alpha.

Fourth, all variables were self-reported in the same questionnaire, creating the possibility of common-method effects. The study did not measure objective processing time, administrative costs, error rates, system usage logs, or school-level digital maturity. The final questionnaire also did not measure resource efficiency as a separate construct. Finally, the sample size restricted the analysis to descriptive statistics, reliability assessment, and bivariate correlations; subgroup comparisons and more complex modelling were not justified.

Future studies should use larger and more diverse samples, preferably with probability-based or stratified recruitment where feasible. Digital transformation should be measured with a validated multi-item instrument covering digital infrastructure, system integration, technology use, staff competencies, leadership support, and organizational readiness. Researchers should combine perceptions with objective indicators such as processing time, error rates, workload records, and system-use data. Longitudinal or quasi-experimental designs could examine changes before and after implementation, while interviews and process mapping could explain how technologies alter administrative routines. Comparative research across states, school types, and institutional sizes would also help clarify contextual differences.

7. CONCLUSION

This study examined the associations between digital technology use and two administrative outcomes among personnel working in private schools in Kuala Lumpur and Selangor. Based on 37 eligible responses, digital technology use was positively associated with administrative efficiency ($\rho = .516$, $p = .001$) and administrative work processes ($\rho = .327$, $p = .048$). The results provide preliminary evidence that respondents reporting greater use of digital technologies also tend to report more favourable administrative outcomes.

The findings should be interpreted as exploratory and associational rather than causal. The small non-probability sample, cross-sectional design, self-reported data, and single-item measure of digital technology

use limit the scope of inference. The study contributes context-specific evidence and underscores the need for more comprehensive measurement, larger samples, and objective administrative indicators in future research.

ETHICAL CONSIDERATIONS

Participation was voluntary. The questionnaire did not require respondents to provide their names or school names, and findings are reported in aggregate form. The thesis records these safeguards but does not provide a formal ethics committee name, approval number, or exemption reference; none is asserted here.

CONFLICT OF INTEREST

The authors should disclose any financial or personal relationships that could be viewed as potential conflicts of interest. No conflict-of-interest declaration was included in the source thesis; the authors must confirm the appropriate declaration before submission.

DATA AVAILABILITY

The data supporting the findings are not publicly available because the survey responses were collected for this academic study and may contain institution-related information. A de-identified dataset may be considered for reasonable academic requests, subject to applicable consent and institutional requirements.

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