REVIEWER'S REPORT

Manuscript No.: IJAR-56432

Title: Digital Learning Spaces and Higher-Order Thinking in Schools

Recommendation:
Accept as it is ....
Accept after minor revision.................
Accept after major revision ....
Do not accept (*Reasons below*) ....

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality			√	
Clarity		√		
Significance		√		

Reviewer's ID: JPR- 212

Detailed Reviewer's Report

This study addresses an important and timely topic—the factors associated with promoting higher-order thinking skills (HOTS) in schools, with particular attention to digital learning spaces, organizational support, leadership, teacher self-efficacy, and professional role differences. The integration of teachers and principals in a single comparative design represents a methodological strength. However, several significant issues require attention before the manuscript can be considered for publication.

Major Concerns

1. Methodological Issues
1.1 Sampling and Generalizability
- The sample (300 teachers, 120 principals) appears adequate in size, but no information is provided about sampling strategy (random, convenience, stratified?). This limits assessment of representativeness.
- The study is conducted within "a centralized education system," but the specific national/cultural context is never identified. Given that educational leadership and technology integration are highly context-dependent, this omission is significant.
- No response rate is reported, raising questions about potential non-response bias.
- **1.2 Measurement Concerns**
- All constructs are measured using self-report instruments, yet no validity evidence (beyond internal consistency) is provided. Factor analyses (EFA/CFA) should be conducted to establish construct validity.
- The measures are described only briefly. Sample items should be provided in an appendix or table.
- Common method variance is a serious concern given that all data come from single-source self-reports. The authors acknowledge this limitation but take no steps to address it methodologically or statistically (e.g., Harman's single-factor test).
- **1.3 Analytical Issues**
- The regression analysis treats principals and teachers as a single sample while including "professional role" as a predictor. Given the extreme mean differences between groups (Cohen's d > 2.0 for all variables), this approach is problematic. The substantial group differences likely violate assumptions of homogeneity of regression slopes.
- A more appropriate approach would be multi-group analysis or separate regressions by role, followed by comparison of coefficients.
- Effect sizes are reported but not consistently interpreted for practical significance.

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- The claim that self-efficacy's contribution is "weaker than organizational support" requires statistical testing of coefficient differences, not mere visual comparison.

- **2. Theoretical and Conceptual Issues**
- **2.1 Conceptual Clarity**
- "Digital learning spaces" is defined broadly but operationalized vaguely. What specific technologies, platforms, or pedagogical uses were measured? This ambiguity limits replicability.
- The distinction between "organizational support" and "instructional leadership" is unclear. These appear to be combined in measurement but treated as conceptually distinct in the framework.
- **2.2 Hypothesis Formulation**
- H2 is formulated as "significantly associated" rather than directional. This appears to be post-hoc hedging based on awareness of complex findings. If the literature supports a directional hypothesis, it should be stated as such.
- The rationale for expecting role differences (H4) is well-developed, but the direction of differences is not hypothesized, despite consistent evidence that principals report more favorable perceptions.
- **2.3 Interpretation of Findings**
- The finding that organizational support/leadership shows "complex" or "not purely facilitative" associations is interpreted as potentially reflecting controlling rather than enabling leadership. This interpretation goes beyond what the data can support, as the study did not measure leadership style or teachers' perceptions of autonomy.
- The conclusion that self-efficacy plays a "contextualized" role is speculative without testing interactions between self-efficacy and organizational conditions.

- **3. Presentation and Reporting Issues**
- **3.1 Incomplete Reporting**
- Table 3 presents t-test results but only shows two of four domains. The full table should be presented.
- Regression diagnostics (multicollinearity, residuals) are not reported despite high correlations among predictors ($r > .70$).
- The reported R^2 value for the regression model is not provided in the text or table.
- **3.2 Inconsistent Messaging**
- The abstract/conclusions emphasize the "complex" and "nuanced" nature of organizational support, yet the hypothesis (H2) was confirmed, suggesting the finding is not particularly complex—it simply shows a positive association.
- The discussion repeatedly states that self-efficacy's contribution was "weak," yet the standardized beta ($\beta = .37$) is moderate by social science standards and larger than professional role ($\beta = .11$). This characterization is misleading.
- **3.3 References**
- Several in-text citations do not appear in the reference list (e.g., Bond et al., 2020; Harris, 2020; Robinson, 2022; Spillane et al., 2019; Voogt et al., 2023).
- Some references are dated or less relevant to the specific claims made.

- **4. Specific Technical Issues**
- **4.1 Statistical Reporting**
- In Table 3, negative t-values are explained as reflecting group ordering—this is correct but the absolute values should be reported for clarity.
- Cohen's d values > 2.0 are exceptionally large and warrant comment. Are these plausible, or could they reflect measurement artifacts (e.g., principals interpreting scales differently)?
- The claim that "moderate effect sizes" were observed for ANOVA results ($\eta^2 = .03\text{-}.04$) is correct by conventional standards, but these are actually small effects.
- **4.2 Figure Quality**
- Figures are described in text but not actually provided in the manuscript. Placeholders like "(Insert Figure 1 about here)" remain.

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- The note accompanying Figure 2 describes what the figure illustrates, but the figure itself is missing.

- **Minor Concerns**
- **Writing and Style**
- The manuscript is generally well-written but contains some redundancy (e.g., the discussion restates findings multiple times).
- There are minor formatting inconsistencies (e.g., inconsistent hyphenation of "higher-order").
- Some paragraphs are excessively long and could be broken for readability.
- **Literature Coverage**
- The theoretical framework is comprehensive but could benefit from more recent citations (2023-2024) in several sections.
- The discussion of digital learning spaces would be strengthened by reference to specific pedagogical models (e.g., TPACK, SAMR).
- **Practical Implications**
- The implications section is thorough but somewhat generic. More concrete, actionable recommendations would strengthen the manuscript's contribution.

- **Recommendations for Revision**
- **Required revisions:**
- **Methodological improvements:**
- Conduct and report factor analyses to establish construct validity.
- Address common method variance through statistical testing (Harman's test) or acknowledgment with appropriate caution.
- Re-analyze regression data separately for teachers and principals, or test for interactions between role and other predictors.
- Provide complete correlation matrices and regression diagnostics.
- **Conceptual clarifications:**
- Clearly define "digital learning spaces" with specific examples of what was measured.
- Distinguish more clearly between "organizational support" and "instructional leadership" conceptually and operationally.
- Revise hypothesis H2 to reflect directional expectations if the literature supports this.
- **Interpretive adjustments:**
- Moderate claims about the "complex" or "controlling" nature of leadership, which exceed the data.
- Accurately characterize the magnitude of self-efficacy effects (moderate, not weak).
- Acknowledge that role differences, while large, may partly reflect positional bias rather than "true" perceptual differences.
- **Presentation corrections:**
- Complete all tables (including full t-test results).
- Include all figures or remove references to them.
- Ensure all in-text citations appear in the reference list.
- Report R^2 value for the regression model.
- **Contextual specification:**
- Identify the educational system/country where the study was conducted, or justify why this is withheld.
- Describe the sampling strategy and response rate.

Conclusion

This study addresses an important research gap and offers potentially valuable insights into the factors associated with HOTS promotion. The comparative design including both teachers and principals is a notable strength. However, significant methodological limitations and interpretive overreach temper confidence in the findings. With major revisions addressing the concerns outlined above, this manuscript could make a meaningful contribution to the literature on educational leadership, technology integration, and higher-order thinking.

Recommendation: Accept after major revision