

REVIEWER'S REPORT

Manuscript No.: IJAR-58571

Title: Determinants of Teachers' Adoption of Assistive Technology for Supporting Students with Specific Learning Disabilities: A Cross-Sectional Survey.

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

Overall Assessment

This manuscript addresses an important and timely topic concerning teachers' adoption of assistive technology (AT) for supporting students with Specific Learning Disabilities (SLDs). The study employs a quantitative cross-sectional survey design with 82 teachers and examines multiple determinants of AT adoption. While the paper has several strengths, including a comprehensive literature review and clear presentation of methodology, there are significant methodological and conceptual issues that require major revision before the manuscript can be considered for publication.

Major Concerns

1. Fundamental Discrepancy Between Correlation and Regression Results

The most critical issue in this manuscript is the inconsistency between the correlation and regression analyses. The Pearson correlation matrix (Table 4.5) shows strong, significant positive correlations between all independent variables and the dependent variable (r ranging from .624 to .762, all $p < .01$). Yet, the multiple regression analysis (Tables 4.6-4.8) yields a non-significant model ($F = 0.712$, $p = .660$) with an R^2 of only .071 and adjusted R^2 of -.017.

This suggests a serious statistical issue. The authors must investigate and explain:

- Whether multicollinearity among predictors is causing unstable regression coefficients (the intercorrelations among predictors range from .488 to .682, which could indicate problematic multicollinearity)
- Whether the sample size ($N = 82$) is insufficient for a regression with seven predictors (the recommended ratio is 10-15 cases per predictor)
- The possibility of suppression effects or statistical anomalies in the data

Recommendation: The authors must run a multicollinearity diagnostic (VIF and tolerance values) and report these. If multicollinearity is present, they should consider using principal component analysis or ridge regression, or reduce the number of predictors. Alternatively, they should acknowledge the limitations of their regression model more prominently.

2. Sample Size and Power Issues

The study uses a sample of 82 teachers with seven predictor variables in the regression model. With a conventional power analysis ($\alpha = .05$, $\beta = .80$), detecting a medium effect size ($f^2 = .15$) would require approximately 103

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participants for seven predictors. The current sample is underpowered, which may explain the non-significant regression results despite significant correlations.

Recommendation: The authors should:

- Provide a power analysis to justify their sample size
- Acknowledge this limitation more explicitly in the limitations section
- Consider conducting bivariate analyses only or using more parsimonious regression models with fewer predictors

3. Hypothesis Testing and Interpretation

The manuscript sets up four hypotheses but fails to adequately explain why H1 was tested when it is essentially a descriptive statement rather than an inferential hypothesis. More importantly, the authors reject H2, H3, and H4 based on non-significant regression results, despite the fact that their correlation analyses show significant relationships. This is confusing and potentially misleading.

Recommendation: The authors should:

- Clearly distinguish between bivariate relationships and multivariate prediction in their hypothesis testing
- Consider reframing the discussion to acknowledge that while individual factors are correlated with AT adoption, they do not collectively predict adoption in this sample
- Address the possibility that other contextual or moderating variables may explain the relationship

4. Theoretical Framework

The conceptual framework is based on the Technology Acceptance Model (TAM) but the authors do not adequately explain the inclusion of all seven variables or how they are operationalized. The framework seems to be a composite of various factors without clear theoretical justification. Moreover, the authors do not explain why TAM was chosen over other models such as UTAUT or the Theory of Planned Behavior.

Recommendation: The authors should:

- Provide a more detailed theoretical justification for their conceptual framework
- Explain the relationship between TAM constructs and their selected variables
- Consider testing the TAM more rigorously using path analysis or structural equation modeling

5. Methodological Limitations

Several methodological issues require attention:

- **Sampling:** The authors used stratified random sampling but do not explain the stratification criteria beyond "different school types and teaching backgrounds." How were the strata determined? Was the sample representative of the population?
- **Questionnaire Development:** The authors mention that the questionnaire was reviewed by experts and pilot-tested, but they do not provide details about how the items were developed, whether they were adapted from validated instruments, or how they determined the number of items per construct.
- **Self-Report Bias:** The study relies entirely on self-report measures, which are susceptible to social desirability bias. The authors note this limitation but do not discuss how they attempted to mitigate it.
- **Cross-Sectional Design:** While the authors acknowledge that cross-sectional design limits causal inference, they still make causal claims in the discussion (e.g., "improvements in teachers' knowledge ... are associated with higher levels of assistive technology adoption"). Correlation does not imply causation.

Recommendation: The authors should:

- Provide more detailed information about the sampling procedure
- Describe the questionnaire development process, including item sources and validation procedures
- Use more cautious language when discussing relationships
- Consider including additional methods (e.g., observation, interviews) to triangulate findings

Minor Concerns

6. Data Presentation and Typographical Errors

- Table 4.1 has formatting issues, with the columns and rows not aligned properly
- On page 15, the p-value for Perceived Usefulness is reported as " $p < .03$ " in the correlation matrix description, but the table shows " $p < .01$ " for all correlations
- The regression tables (4.6-4.8) are incomplete, with missing coefficient values in Table 4.8
- There are several typographical errors throughout the manuscript (e.g., "simulated dataset" on page 17)

Recommendation: Thorough proofreading and correction of all typographical errors is required. Tables must be formatted properly and completed.

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7. Literature Review Gaps

The literature review is comprehensive, but it lacks discussion of several relevant studies:

- Research on technology adoption in Indian educational contexts (which would be particularly relevant given the study's setting)
- More recent meta-analyses on assistive technology adoption
- Studies examining the digital divide and access issues in developing countries

Recommendation: Expand the literature review to include more research from the Indian context and developing countries.

8. Discussion and Implications

The discussion section does not adequately address the theoretical implications of the non-significant regression results. The authors mention that "additional contextual and organizational factors" may influence adoption, but they do not specify what these might be. Furthermore, the practical implications (Section 7) are generic and do not flow naturally from the findings.

Recommendation: The authors should:

- Discuss why their findings contradict previous research and the TAM framework
- Propose specific additional factors that should be investigated
- Tailor practical implications to their specific findings rather than providing general recommendations

9. Ethical Considerations

While the authors mention ethical principles were maintained, they do not provide details about:

- Whether ethical approval was obtained from an institutional review board
- How informed consent was obtained
- Data storage and protection procedures

Recommendation: Include a more detailed ethics statement.

10. Clarity and Organization

- The abstract is too long and contains excessive detail
- Section 1.1 (Background) is overly long and could be condensed
- The literature review on teachers' adoption (Section 2.3) is extensive but somewhat unfocused
- The numbering of tables and figures is confusing

Recommendation: Restructure and condense the manuscript for better readability.

Specific Technical Comments

1. **Theoretical Framework:** Figure 1 is mentioned but appears to be missing from the manuscript. Please ensure it is included.
2. **Statistical Analysis:** The authors should report effect sizes (e.g., Cohen's f^2) for the regression model to provide information about the practical significance of their findings.
3. **Assumption Testing:** While the authors report normality testing, they do not discuss testing for other regression assumptions, including:
 - Linearity
 - Homoscedasticity
 - Independence of errors
 - Multicollinearity
 - Influential outliers
4. **Cronbach's Alpha:** The authors report good reliability but do not discuss whether the alpha values are too high (which could indicate item redundancy).
5. **Data Interpretation:** The high mean scores for all constructs may suggest ceiling effects, which would reduce variability and affect correlation and regression results. This should be discussed.

Suggested Revisions

Essential Revisions

1. **Address the correlation-regression discrepancy:** Investigate and report on multicollinearity, sample size adequacy, and consider using fewer predictors in the regression model.
2. **Provide a power analysis:** Justify the sample size or acknowledge the limitation more prominently.
3. **Reconsider hypothesis testing:** Distinguish between bivariate relationships and multivariate prediction.
4. **Complete missing data:** Tables 4.6-4.8 are incomplete and must be finalized.

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5. **Expand theoretical justification:** Provide a stronger rationale for the conceptual framework and the selection of variables.
6. **Add multicollinearity diagnostics:** Report VIF and tolerance values.
7. **Include effect sizes:** Report Cohen's f^2 and partial eta-squared where appropriate.
8. **Strengthen the discussion:** Address the theoretical implications of the findings and propose specific additional factors for future research.

Recommended Revisions

1. **Expand the literature review:** Include Indian context studies and more recent meta-analyses.
2. **Add methodological details:** Describe questionnaire development, sampling procedure, and ethical approval.
3. **Use more cautious language:** Avoid causal language when discussing correlational findings.
4. **Condense the manuscript:** Reduce the length of the background section and focus on key points.
5. **Include the conceptual framework figure:** Ensure Figure 1 is included in the manuscript.
6. **Proofread thoroughly:** Correct all typographical errors and formatting issues.

Conclusion

This manuscript addresses a significant gap in the literature by examining teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities. The study employs a solid theoretical framework and appropriate analytical methods. However, the serious discrepancy between the strong correlations and non-significant regression results raises questions about the statistical validity of the findings. Major methodological issues, including inadequate sample size, potential multicollinearity, and incomplete data presentation, need to be addressed before the manuscript can be considered for publication.

The study has the potential to make a meaningful contribution to the literature, particularly in providing evidence from contexts where research on this topic is limited. However, in its current form, the manuscript requires substantial revisions to ensure that the conclusions are valid, reliable, and appropriately interpreted.

Recommendation: Major revision.

Questions for the Authors

1. What is the VIF and tolerance values for each predictor in the regression model? How did you address multicollinearity issues?
2. Why did you choose to include seven predictors in the regression model with a sample size of only 82 participants?
3. How do you explain the inconsistency between the significant correlations and non-significant regression results?
4. What specific contextual or organizational factors do you believe may explain the remaining variance in AT adoption?
5. How were participants stratified in the sampling procedure, and how do you ensure the sample is representative?
6. Can you provide more detail about the questionnaire development process, including item sources and how content validity was established?
7. Did you test other regression assumptions (linearity, homoscedasticity, independence of errors)?
8. How do you explain the high mean scores across all constructs? Is there a possibility of ceiling effects or social desirability bias?

Final Evaluation

Originality: The manuscript addresses an important topic and extends the literature on AT adoption to the context of teachers supporting students with SLDs. However, the study is largely confirmatory rather than novel in its approach.

Technical Quality: The methodology is generally sound, but significant issues with sample size, statistical analysis, and interpretation undermine the technical quality. Major revisions are required.

Clarity: The manuscript is well-written and logically organized. However, the inconsistency between the correlation and regression results creates confusion that must be resolved.

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Significance: The topic is significant and timely, particularly given the increasing emphasis on inclusive education and the use of assistive technology. However, the current findings (non-significant regression) are somewhat limited in their practical implications.