

REVIEWER'S REPORT

Manuscript No.: IJAR-58717

Title: THE ACCELERATION OF SCIENTIFIC RESEARCH ON DIGITAL EDUCATION IN MOROCCAN HIGHER EDUCATION: A PRE- AND POST-COVID-19 COMPARATIVE ANALYSIS .

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

General Assessment

This paper presents a timely and relevant quantitative analysis of the acceleration of Educational Technology (EdTech) research in Moroccan higher education following the COVID-19 pandemic. The study addresses an important gap in the literature by examining not only research outputs but also the institutional infrastructure supporting digital education research. The comparative pre- and post-pandemic design offers valuable insights into how crises can reshape national research agendas.

Strengths

- Clear Research Focus:** The paper clearly defines its scope and objectives, providing a focused examination of four complementary indicators of research development.
- Appropriate Methodology:** The quantitative scientometric approach with Growth Rates and Acceleration Factors provides a straightforward and transparent framework for measuring change.
- Comprehensive Data Sources:** The study draws on multiple reliable sources (Scopus, Web of Science, Ministry reports, CNRST documentation), enhancing the credibility of findings.
- Logical Structure:** The paper follows a clear progression from introduction to data, methodology, results, discussion, and conclusion.
- Practical Implications:** The study offers meaningful policy recommendations for sustaining research capacity in Moroccan higher education.

Critical Issues Requiring Revision

1. Methodological Limitations and Causality (Major Concern)

Issue: The study acknowledges that "the pre-post design does not establish causality" (Page 4), yet the discussion frequently implies causal attribution to COVID-19. The absence of a control group and annual time-series data limits the ability to attribute observed growth exclusively to the pandemic.

Recommended Revision:

- Modify language throughout** to use more cautious phrasing such as "associated with," "corresponded with," or "coincided with" rather than "caused by."
- Add a dedicated subsection** in the Discussion addressing alternative explanations for the growth (e.g., increased research funding generally, policy changes prior to COVID-19, maturation of the research system).

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- **Consider acknowledging** that some growth may represent catch-up effects or pre-existing trends that were accelerated by the pandemic.

2. Formula Error (Critical)

Issue: The Growth Rate formula on Page 3 and repeated on Page 4 contains a critical error:

text

$$\text{Growth Rate (\%)} = [(\text{Value}_{2023} - \text{Value}_{2019}) / \text{Value}_{2019}] \times 10$$

Correction: The formula should use $\times 100$, not $\times 10$. The calculated results in the table (e.g., 276.5%, 366.7%, 300%, 351.7%) confirm that $\times 100$ was actually used.

Recommended Revision:

- **Correct the formula** to:
$$\text{Growth Rate (\%)} = [(\text{Value}_{2023} - \text{Value}_{2019}) / \text{Value}_{2019}] \times 100$$
- **Check consistency** across all instances of the formula in the manuscript.

3. Missing Error or Confidence Measures

Issue: The study presents percentages and factors without any measures of uncertainty, confidence intervals, or statistical significance testing. This is particularly concerning given the small baseline values (e.g., n=7 laboratories, n=32 theses).

Recommended Revision:

- **Add confidence intervals** or standard errors where appropriate.
- **Consider including** simple statistical tests (e.g., chi-square tests for proportions, binomial tests for count data) to establish whether observed differences are statistically meaningful.
- **Acknowledge the limitations** of interpreting growth from small baseline numbers.

4. Inconsistent Terminology and Formatting

Issue: Several terms are used inconsistently throughout the manuscript:

- "Accessibility Factor" used in Figure 1 and Figure 2 captions instead of the correct "Acceleration Factor"
- "Accessibility Factor" (Page 5) vs. "Acceleration Factor" (Page 1, Page 4)
- "Covid 2023" in table header (Page 3) - unclear what this refers to

Recommended Revision:

- **Replace all instances** of "Accessibility Factor" with "Acceleration Factor"
- **Clarify the table header** - "COVID-19" is the event, not a time period
- **Proofread** for consistency in terminology

Minor Issues

5. Incomplete References

Issue: Several references lack essential information:

- "Ministry of Higher Education, Scientific Research, and Innovation. (2022). National Report on Scientific Research and Innovation: Focus on Digital Transformation." - Missing page numbers, report number, or DOI/URL.
- "Bozkurt, A., et al. (2023). Speculative Futures on ChatGPT..." - The use of "et al." is appropriate, but the full list of authors in other references (Bozkurt et al., 2020) is inconsistently formatted.

Recommended Revision:

- **Provide complete bibliographic details** for all references.
- **Standardize the "et al." usage** according to journal guidelines.

6. Redundant Content

Issue: The "Data" section on Page 3 repeats content from the methodological description on Page 2-3, including the full formula definitions.

Recommended Revision:

- **Consolidate these sections** to improve flow and avoid repetition.
- **Move the full formula presentation** to the Methodology section only.

7. Terminology Clarification

Issue: "Emergency Remote Teaching (ERT)" is introduced but never elaborated. While this is standard terminology, some readers may benefit from a brief definition or reference.

Recommended Revision:

- **Add a brief parenthetical explanation** when first using ERT, or include the Hodges et al. (2020) reference that defines the distinction between ERT and planned online learning.

Suggestions for Enhancement

8. Adding a Theoretical Framework

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Recommendation: The study would benefit from a more explicit theoretical framework. The mention of "focusing events" and "field-building" (Page 2) could be expanded to draw on established theories such as:

- Kingdon's Multiple Streams Framework (agenda-setting)
- Institutional theory (how fields become established)
- Science policy frameworks (research priority-setting)

9. Strengthening the Qualitative Context

Recommendation: While quantitative analysis is the core contribution, adding qualitative context would strengthen the interpretation:

- **Brief examples** of funded projects (what topics, which institutions)
- **Description of new laboratories** (disciplinary composition, focus areas)
- **Thematic analysis** of publication topics (what research questions emerged)
- **Institutional policy documents** that explicitly prioritized EdTech research post-pandemic

10. Visual Presentation

Recommendation: The paper references figures that are not included in the current version. If figures are intended for publication:

- **Ensure all figures are included** and properly captioned
- **Consider replacing text-only data** (the table) with a more visually compelling format
- **Add error bars** to figures if confidence intervals are calculated

11. Additional Indicators

Recommendation: Consider adding one or more qualitative or contextual indicators to strengthen the analysis:

- **Number of conferences/workshops** on EdTech in Morocco
- **Research collaborations** (national/international partnerships)
- **Publications in high-impact journals** (quality indicator)
- **Citation counts** for Moroccan EdTech research

Language and Writing Style

Strengths: The paper is generally well-written, with clear academic language and logical flow. The abstract effectively summarizes the study.

Minor Suggestions:

- **Reduce passive voice** where possible to improve readability.
- **Shorten some sentences** - several are overly long (e.g., Page 2, lines 28-35, 44-48).
- **Check agreement** between subjects and verbs (e.g., "four indicators... demonstrates" on Page 7).
- **Use consistent tense** in the literature review section.

Ethical Considerations

Not applicable - The study uses publicly available bibliometric and institutional data. No human subjects were involved.

Overall Recommendation: Accept After Minor Revision

This paper makes a valuable contribution to understanding how a major crisis can reshape national research priorities and infrastructure. The findings are timely and relevant for both Moroccan higher education policy and broader scholarship on digital education transformation.

Required Revisions Summary:

1. **Correct the Growth Rate formula** ($\times 10 \rightarrow \times 100$) throughout
2. **Replace "Accessibility Factor"** with "Acceleration Factor" in figure captions
3. **Add appropriate caution** regarding causal attribution throughout Discussion and Conclusion
4. **Address methodological limitations** more explicitly
5. **Complete the reference list** with missing bibliographic details

Optional Enhancements (for strengthening the contribution):

- Add confidence intervals and statistical significance testing
- Include qualitative context about funded projects and new laboratories
- Develop a stronger theoretical framework
- Ensure all referenced figures are included in the final version

Final Rating Summary

Criteria	Assessment
Originality	Good - Addresses an underexplored area (research ecosystem transformation, not

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	just technology adoption)
Technical Quality	Good - Sound methodology with minor concerns about formula error and lack of statistical validation
Clarity	Excellent - Well-organized and clearly written
Significance	Excellent - Timely findings with clear policy implications for Moroccan and similar emerging higher education systems

Additional Comments for the Editor

This paper would be well-suited for publication in an international education or higher education journal with a focus on digital transformation and educational technology in emerging contexts. With the required minor revisions, it will make a significant contribution to understanding research capacity development in times of crisis. The study's emphasis on institutional infrastructure (laboratories, funded projects, doctoral theses) is particularly valuable, as much research in this area focuses narrowly on publication metrics or student/teacher perceptions.