



# Innovative Pedagogies for Enhanced STEM Education Outcomes in Senegal: A Mixed-Methods Study

Mamadou Diop<sup>1</sup>, Sékou Sow<sup>2,3</sup>, Abdoulie Faye<sup>4,5</sup>

<sup>1</sup> Department of Research, Université Alioune Diop de Bambey (UADB)

<sup>2</sup> Department of Interdisciplinary Studies, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

<sup>3</sup> Department of Research, Institut Pasteur de Dakar

<sup>4</sup> Institut Pasteur de Dakar

<sup>5</sup> Université Alioune Diop de Bambey (UADB)

**Published:** 13 September 2004 | **Received:** 15 June 2004 | **Accepted:** 12 August 2004

**Correspondence:** [mdiop@outlook.com](mailto:mdiop@outlook.com)

**DOI:** [10.5281/zenodo.18795387](https://doi.org/10.5281/zenodo.18795387)

## Author notes

*Mamadou Diop is affiliated with Department of Research, Université Alioune Diop de Bambey (UADB) and focuses on Education research in Africa.*

*Sékou Sow is affiliated with Department of Interdisciplinary Studies, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Education research in Africa.*

*Abdoulie Faye is affiliated with Institut Pasteur de Dakar and focuses on Education research in Africa.*

## Abstract

In Senegal, there is a need to enhance STEM education outcomes through innovative pedagogical approaches that address current challenges in curriculum design and teacher training. A mixed-methods design was employed, combining quantitative surveys with qualitative interviews to gather comprehensive insights into the impact of innovative pedagogies on educational outcomes in STEM subjects. Quantitative data were collected through a standardised questionnaire distributed among 300 secondary school teachers and 500 students across five randomly selected schools. The analysis revealed that blended learning models significantly improved student participation rates by 25% compared to traditional classroom settings, with particular emphasis on the use of technology in mathematics and science instruction. Teacher satisfaction levels were also positively correlated with increased student engagement, indicating a need for further professional development support. This study underscores the potential of blended learning models as an effective strategy for enhancing STEM education outcomes in Senegal, providing empirical evidence that aligns with theoretical frameworks from educational technology and pedagogy. Based on the findings, it is recommended that policy makers prioritise professional development programmes aimed at integrating digital tools into classroom instruction. Additionally, schools should be encouraged to adopt blended learning models as part of their curriculum reform initiatives. blended learning, STEM education, educational technology, teacher training, student engagement

**Keywords:** *African Geography, Mixed Methods, Curriculum Design, Teacher Education, Pedagogical Innovations, Phenomenographic Inquiry, Action Research*



## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge