Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review

PROJECT CONCEPT NOTE

By

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Executives Summary

This is a project concept note outlining critical elements of the assignment. This include:

1. Working title of the main deliverable. *"Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review"*
2. Four Research Questions
3. Methodology
4. Research Deliverable (Paper outline)
5. Project Schedule
6. Project Contract Template

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1. BACKGROUND

The Education 2030 Agenda for Sustainable Development opened a new chapter in the long struggle towards achieving gender equality. Its commitment to 'leave no one behind' expresses the conviction that boys and girls, men and women should benefit equally from development. It envisages a 'world in which every woman and girl enjoys full gender equality and all educational, legal, social and economic barriers to their empowerment have been removed'. 'Realizing gender parity and the empowerment of women and girls in education will make a crucial contribution to progress across all the Goals and targets.

Global Education Monitoring Report establishes 'the mechanism for monitoring and reporting on SDG 4 and on education in the other SDGs' with the responsibility to 'report on the implementation of national and international strategies to help hold all relevant partners to account for their commitments as part of the overall SDG follow-up and review.' No target in this agenda, including Education can therefore be considered met unless gender parity realized.

Despite these efforts, declarations and aspirations by, UN, governments and nations, prior studies have established the fact that gender parity is still a challenge in many nations across the globe. For this reason, the main purpose of this comprehensive literature review is to establish the status of gender parity in STEM education in Kenya. The challenges and their causes that hinder the achievement of gender parity, the existing interventions/programs/project and their failures or success, as well as the gaps that exist, and the plausible interventions and recommendations that can fill these gaps.

2. RESEARCH QUESTIONS

This review aims to answer the following four research questions

1. What's is the status of Gender parity in STEM education in Kenya
2. What intervention /projects/programs are in place to bridge the gaps in gender parity in STEM education in Kenya.
3. What gaps exist in the intervention /projects/programs for Gender parity in STEM education in Kenya
4. What recommendations to fill these gaps in form of intervention /projects/programs for Gender parity in STEM education in Kenya

3. METHODOLOGY

3.1 Research Strategy

According to Onwuegbuzie; and Frels (2016) posts that like most complex and challenging projects, literature reviews are less overwhelming if they are approached in a systematic fashion, one small piece at a time. Consequently, for this research project to be a success, here are the steps to follow to be followed:

1. Write a detailed plan that outlines the purpose, objectives, and methods to define the literature review.
2. Perform the search using a methodical approach.
3. Select and obtain articles.
4. Summarize highlights from the selected articles.
5. Prepare a data analysis spreadsheet to consolidate information.

6. Create report tables.
7. Write the report text.

3.2 Research Methodology

The methodology for searching and selecting the literature, includes:

- Reputable data sources (See Appendix 4)
- Search terms to include. (See Appendix 3)
- Search terms to exclude.
- Search limits (e.g., English language, studies less than 20 years old etc.).

- Article selection criteria (e.g., peer-reviewed scientific publications, UN, World bank with similar intended use, etc.).

4 PROJECT DELIVERABLE (PAPER) OUTLINE

The deliverable of this project assignment will be a 15 to 20 pages Systematic Literature review paper with the following key headings (see Appendix 2 for details).

1. Abstract
2. Introduction
3. Research Questions
4. Problem Overview
5. Literature Review
6. Methods
7. Analysis, Results & Findings
8. Discussion
9. Conclusions
10. Recommendations for Further work
11. References

5 PROJECT SECHEDULE

ID	PHASE	TASK NAME	STATUS
1	INITIATION	Project Discussions	■
		Project Approval	◆
		Concept Note Dev	■
		Award Letter	◆
2	PLANNING	Project Team	■
		Search Strategy	■
		Search Databases	■
		Search Keywords	■
		Concept Approval	◆
3	EXECUTION	Articles Searching	■
		Articles Selecting	
		Articles Analysis	
		Write Draft Paper	
		Draft Research paper	◆
4	PROGRESS MEETINGS		▲
		Draft Paper Review	
		Paper Review Report	◆
		Final Report	
5	Project Closure	Accounts Reconciliation	
		Project Certificate of Completion	

KEY
- Completed Tasks
- Pending/ongoing Tasks
- On schedule
- Late Tasks

Syymbols
- ■ Task/Activity
- ◆ Milestone
- ▲ Recurring Task

APPENDIX 1: RESEARCH QUESTION

Appendix 1.1: Paper Research Question

#1- "Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review"

Research Questions

This review aims to answer the following four research questions

1. What's is the status of Gender parity in STEM education in Kenya
2. What intervention /projects/programs are in place to bridge the gaps in gender parity in STEM education in Kenya.
3. What gaps exist in the intervention /projects/programs for Gender parity in STEM education in Kenya
4. What recommendations to fill these gaps in form of intervention /projects/programs for Gender parity in STEM education in Kenya

Appendix 1.2: Other Research Question

APPENDIX 2: PAPER OUTLINE   (DELIVERABLE)

"Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review"

1. **Abstract**
2. **Introduction**
3. **Research Questions**
4. **Problem Overview**
5. **Literature Review**

APPENDIX 3: SEARCH KEYWORDS AND PHRASES

"Girls Education"	AND	"Professional recruitment "	AND	"Gender Diversity"	AND	STEM		
	AND	Kenya						
"Girls Education"	AND	"STEM programs" or "STEM subjects"	AND	"Gender Diversity"	AND			
	STEM	AND	Kenya					
"Girls Education"	AND	" Digital learning" or "Smart Learning"	AND	"Gender Diversity"	AND			
	STEM	AND	Kenya					
"Girls Education"	AND	Competitions	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Girls Education"	AND	Integration	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Girls Education"	AND	"Capacity Building"	AND	"Gender Diversity"	AND	STEM	AND	
	Kenya							
"Girls Education"	AND	"career pathways to STEM"	AND	"Gender Diversity"	AND	STEM		
	AND	Kenya						

"Girls Education"AND "Competency Based Curriculum" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "current curriculum " AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "innovation STEM Hubs" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Integrating Technology tools" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Learners Achievement " AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Learners Experience" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Out of school STEM programs " AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "problem solving" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Resource allocations" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "Role model networking" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "staff training" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "stakeholder buy ins" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND "STEM perceptions" AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Advantages AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Culture AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Disadvantages AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Failed AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Failure AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Gaps AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Inequality AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND infrastructures AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Interventions AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Merits AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Outcomes AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Performance AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Recommendations AND "Gender Diversity" AND STEM AND Kenya

"Girls Education"AND Weakness AND "Gender Diversity" AND STEM AND Kenya
STEM AND

"Women Education" AND "Professional recruitment " AND "Gender Diversity" AND STEM AND Kenya

"Women Education" AND "STEM programs" or "STEM subjects" AND "Gender Diversity" AND STEM AND Kenya

"Women Education" AND " Digital learning" or "Smart Learning" AND "Gender Diversity" AND STEM AND Kenya

"Women Education" AND Competitions AND "Gender Diversity" AND STEM AND Kenya

"Women Education" AND Integration AND "Gender Diversity" AND STEM AND Kenya

"Women Education" AND "Capacity Building" AND "Gender Diversity" AND STEM AND Kenya

"Women Education"	AND	"career pathways to STEM"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"Competency Based Curriculum"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"current curriculum "	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"innovation STEM Hubs"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"Integrating Technology tools"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"Learners Achievement "	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"Learners Experience"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"Out of school STEM programs "	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	"problem solving"	AND	"Gender Diversity"	AND	STEM	AND	Kenya
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"Women Education"	AND	Gaps	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Inequality	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	infrastructures	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Interventions	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Merits	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Outcomes	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Performance	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Recommendations	AND	"Gender Diversity"	AND	STEM	AND	Kenya
"Women Education"	AND	Weakness	AND	"Gender Diversity"	AND	STEM	AND	Kenya

STEM   AND

"Girls Education"	AND	"Professional recruitment "	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"STEM programs" or "STEM subjects"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	" Digital learning" or "Smart Learning"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	Competitions	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	Integration	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"Capacity Building"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"career pathways to STEM"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"Competency Based Curriculum"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"current curriculum "	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"innovation STEM Hubs"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
"Girls Education"	AND	"Integrating Technology tools"	AND	"Gender Inequality"	AND	STEM	AND	Kenya
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"Women Education"	AND	Weakness	AND	"Gender Inequality"	AND	STEM	AND	Kenya

APPENDIX 4: DATABASES TO BE SEARCHED

The following 36 journals are accessible to some good degree through our library. 5 of the most fruitful databases (five of the ones with a green tick) will be considered in the analysis. Papers that will be locked in this database will not be considered.

SELECTED-YES/NO		Database Name
	1	IMF elibrary
✔	2	Informs
✔	3	JSTOR
	4	Kenya Information Preservation Society
	5	Kluwer Online
	6	Liebert Online
	7	Liverpool Journals
	8	Lyell Collection
✔	9	Mathematical Science Publishers
	10	MSD Manuals
	11	Nature
	12	OECD iLibrary
	13	Online English Dictionary
	14	Online Wiley
	15	Oxford Journals
✔	16	Palgrave Journals
	17	Project Muse
	18	PsycArticles
	19	Public Domain Resources
	20	Research4Life
	21	Research Methods Supercourse
	22	Royal Society of Chemistry Journals
✔	23	Sage e-Journals
	24	Sage Research Methods & 2020 Cases
✔	25	Science Direct
	26	Springer eBooks
✔	27	Taylor & Francis Journals
	28	Taylor and Francis e-Books
	29	The Kenya Law
	30	The Teaching Professor
	31	Times Higher Education
	32	University of California Press
✔	33	United Nations iLibrary
	34	WHED
✔	35	World Bank Databases
	36	Ask a Librarian for Articles

APPENDIX 5 : PROJECT CONTRACT TEMPLATE

Date.................................

Prof Jimmy Macharia, PhD
Associate Professor of Information Systems &Technology,
Department of Computing
School of Science & Technology,
United States International University - Africa
Off USIU Road, Off Thika Road (Exit 7),
P. O. Box 14634 - 00800,
Nairobi, Kenya, East Africa.

Dear Prof Macharia

SUBJECT: Letter of Award: "Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review"

This Letter of Award, (the" Letter") is in reference to our video conference discussion on the above subject matter on Saturday 22 February 2020 and the subsequent discussions and/or related correspondence between us. thereof from which you submitted a project concept note for consideration dated 29 February 2020.

Diversity Education Institute (DEI) ("**Organization**") has today finalized the review and approval of your project concept note and does hereby award you (Prof Jimmy Macharia, PhD) ("**Contractor**") the Contract for the provision of a research paper entitle "Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review" (the "**Services**"), subject to the following:

1 Finalization and execution of the agreement, having been reached between Diversity Education Institute (DEI) and yourself based on signed and approved project concept note.
2 This Letter constitutes a commitment for Diversity Education Institute (DEI) to provide facilitation funds and other necessary actions for smooth execution of this assignment.
3 In this commitment by Diversity Education Institute (DEI), the main responsibilities include:

   - Review and approval of the concept one submitted by contractor for this project
   - Provide 50% of the $2000 agreed facilitation funds upon signing the concept note and providing the offer letter to the contractor.
   - Plan to review the paper when submitted on timely manner, and give any (feedback) as scheduled for its conclusion and project closure.
   - If DEI needs conference paper presentation, plan to meet conference registration and any other associated costs.

4. The Contractor obligations include:
   - Prepare and submit a comprehensive project concept note for review and approval
   - Upon receiving the award letter, Commence/proceed with the project activities as generally described in the approved project concept note.
   - Deliver the research paper titled "Bridging the Gap in Gender Parity in STEM education in Kenya: A comprehensive Literature Review"

The Letter is governed by and shall be construed in accordance with the laws of Kenya and any dispute arising out of or in connection with this Letter shall be subject to the exclusive jurisdiction of the Kenyan courts.

The parties agree that this Letter will be considered a legal document and shall be considered confidential until such time that the parties have finalized and executed the contract. The executed contract shall replace and supersede the terms of this Letter.

The Letter is addressed to you in duplicate. Please signify acceptance of its terms by signing the duplicate and returning it to Mr Alphonse Faruma.

We look forward to working with you on this mutually beneficial and successful project.

………………………………………………… Date ………………………………
Alphonse Faruma
CEO - Diversity Education Institute (DEI)

………………………………………………… Date ………………………………
Prof Jimmy Macharia, PhD
Contractor