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# Factors Influencing Stem Enrollment at Kasama College of Education and St. Mary's College of Education in Zambia

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**Abstract-** This study examines the factors influencing enrollment in Science, Technology, Engineering, and Mathematics (STEM) programs at Kasama College of Education (KCE) and St. Mary's College of Education (SMCE) in Zambia. The study focuses on socio-economic barriers, cultural perceptions, availability of resources, and the role of mentorship in shaping students' decisions to pursue STEM education. A mixed-method research design was employed, combining quantitative and qualitative approaches. Data were collected through structured questionnaires, interviews, and focus group discussions involving students, lecturers, and administrators. The findings reveal that financial constraints, negative societal attitudes, inadequate infrastructure, and lack of mentorship significantly hinder STEM enrollment. The study concludes that addressing these challenges requires coordinated efforts from government, institutions, and stakeholders. Recommendations include increased financial support, improved infrastructure, gender-sensitive interventions, and establishment of mentorship programs.

**Keywords-** STEM enrollment, socio-economic factors, cultural perceptions, mentorship, Zambia, higher education.

## I. Introduction

Science, Technology, Engineering, and Mathematics (STEM) education is widely recognized as a critical driver of innovation, economic growth, and sustainable development. Globally, nations are investing heavily in STEM education to prepare a workforce capable of addressing complex technological and scientific challenges.

In Zambia, despite policy efforts to promote STEM education, enrollment levels remain relatively low, particularly in teacher training institutions such as Kasama College of Education (KCE) and St. Mary's College of Education (SMCE). This trend raises concerns about the country's ability to produce a skilled workforce necessary for national development.

Several factors influence students' decisions to enroll in STEM programs. These include socio-economic conditions, cultural beliefs, access to learning resources, and exposure to mentorship. In rural and semi-urban areas like Kasama, these challenges are often more pronounced due to limited infrastructure and opportunities.
This study investigates the factors influencing STEM enrollment at KCE and SMCE with the aim of identifying barriers and proposing strategies to enhance participation, especially among underrepresented groups such as female students.

## II. Literature Review

### Socio-Economic Barriers

Socio-economic status plays a significant role in determining access to education. Studies have shown that students from low-income families are less likely to enroll in

STEM programs due to the high costs associated with laboratory equipment, textbooks, and tuition fees.

In Zambia, financial challenges are particularly significant in rural areas where families have limited income sources. As a result, many students opt for non-STEM programs that are perceived to be less costly.

**Cultural and Societal Perceptions**
Cultural beliefs and gender stereotypes strongly influence educational choices. STEM fields are often perceived as male-dominated, discouraging female participation.
The concept of the "leaky pipeline" explains how female students gradually drop out of STEM fields due to societal pressure and lack of support. Addressing these perceptions is essential for improving gender equity in STEM education.

**Availability of Resources**
Effective STEM education requires adequate infrastructure such as laboratories, computers, and teaching materials. However, many institutions in Zambia face resource constraints.

Limited access to modern equipment reduces students' interest and ability to engage in STEM learning, ultimately affecting enrollment levels.

**Mentorship and Role Models**
Mentorship plays a vital role in motivating students to pursue STEM careers. Students who interact with mentors are more likely to develop confidence and interest in STEM fields.

However, many institutions lack structured mentorship programs, and female role models in STEM remain limited, further discouraging female participation.

## III. Methodology

**Research Design**
The study employed a mixed-method research design combining quantitative and qualitative approaches.

**Population and Sample Size**
The target population consisted of 400 students from KCE and SMCE, along with lecturers and administrators. A sample of 60 respondents was selected using stratified random sampling.

Table 3.1: Sample Distribution

| Category | Number of Respondents |
|---|---|
| Students | 45 |
| Lecturers | 10 |
| Administrators | 5 |

| Category | Number of Respondents |
|---|---|
| Total | 60 |

**Data Collection Methods**

- Questionnaires
- Interviews
- Focus group discussions

**Data Analysis**

Quantitative data were analyzed using percentages and frequencies, while qualitative data were analyzed using thematic analysis.

## IV. Presentation And Analysis Of Findings

**Socio-Economic Factors**

Table 4.1: Financial Constraints Affecting STEM Enrollment

| Response | Frequency | Percentage |
|---|---|---|
| Yes (Affected) | 36 | 60% |
| No | 24 | 40% |
| Total | 60 | 100% |

The majority of respondents (60%) indicated that financial constraints affect their ability to enroll in STEM programs.

Cultural Perceptions

Table 4.2: Influence of Gender Perceptions

| Response | Frequency | Percentage |
|---|---|---|
| Yes | 36 | 60% |
| No | 24 | 40% |
| Total | 60 | 100% |

This shows that societal beliefs significantly influence students' choices, particularly among female students.

Resource Availability

Table 4.3: Access to STEM Resources

| Resource Availability | Frequency | Percentage |
|---|---|---|
| Adequate | 27 | 45% |
| Inadequate | 33 | 55% |
| Total | 60 | 100% |

More than half of the respondents reported inadequate access to STEM resources.

**Mentorship**

Table 4.4: Access to Mentorship

| Mentorship Access | Frequency | Percentage |
|---|---|---|
| Yes | 8 | 13% |
| No | 52 | 87% |
| Total | 60 | 100% |

A significant majority (87%) lack access to mentorship, indicating a major gap.

## V. Discussion

The findings reveal that STEM enrollment at KCE and SMCE is influenced by multiple interconnected factors. Financial constraints limit students' ability to access STEM programs, while cultural perceptions discourage female participation.

Inadequate resources further reduce the quality of STEM education, making these programs less attractive. Additionally, the absence of mentorship deprives students of guidance and motivation.

These findings align with global studies emphasizing the importance of financial support, infrastructure, and mentorship in promoting STEM education.

## VI. Conclusion

The study concludes that STEM enrollment at KCE and SMCE is significantly influenced by socio-economic challenges, cultural beliefs, lack of resources, and limited mentorship opportunities.
Addressing these factors is essential for improving STEM participation and ensuring that Zambia develops a skilled workforce capable of driving innovation and development.

**Recommendations**

1. Provide scholarships and financial aid for STEM students
2. Promote gender equality in STEM education
3. Improve infrastructure and learning resources
4. Establish mentorship programs
5. Strengthen career guidance and awareness

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