O’ Level Mathematics Quality Instruction Enhancement Strategy: Application of ZIMSEC Examiners’ Reports in Secondary Schools

EVELYN MATURURE

Zimbabwe School Examinations Council (ZIMSEC)

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CONTEXT

- There are more than 3000 secondary schools in Zimbabwe each with at least one mathematics teacher. Mathematics is compulsory at O Level
- All qualified mathematics teachers are able to teach up to at least the O level syllabus.

- 95% of secondary schools are public schools.
- All public school learners sit for ZIMSEC examinations in their fourth year
- ZIMSEC offers O level examinations twice a year (**June and November**)
- After marking, an examiners' report is produced for each subject component and is eventually availed on the ZIMSEC website (**since 2019**) to be accessed by stakeholders, including mathematics teachers

Context: Some Contents of the Reports

Overview of the examination

General Performance Analysis

- Summary of overall candidate performance.

Strengths and Weaknesses

- Common areas where candidates performed well.
- Topics or question types that posed challenges.

Question-by-Question Analysis

- Detailed feedback on individual questions.
- Common errors and misconceptions made by candidates.
- Insights into expected responses and mark allocation.

Recommendations for learners

- Study tips and areas for improvement. Suggested resources or practices.

Problem Statement

The persistent challenges in mathematics proficiency among O Level learners in Zimbabwe highlight a critical need for enhanced instructional strategies.

Pass rates

Nov 2021 (25.64%), 2022 (26.18), 2023 (26.12), 2024 (26.08)

[Source: ZIMSEC Grade Cards]

Despite the availability of ZIMSEC examination reports online, which detail learner performance trends and common misconceptions, trends show a continuous pattern of poor performance by learners in ZIMSEC examinations.

•National Priority: Improving the quality of mathematics instruction is essential due to concerning learner performance in national examinations.

The Gap

- **Previous researches have not comprehensively explored how mathematics teachers in Zimbabwe receive, interpret, and apply ZIMSEC examiners' reports in their instructional practices.**

Regionally, Nsingo (2015) carried a study in Namibia with the purpose to gain insight into teachers' use of examiners' comments during Biology instruction especially considering that similar comments seem to be repeated in examiners' reports year after year.

- **Localisation, from Cambridge, of Ordinary Level Examinations was completed in 1995**
- **The inherited Cambridge examination system availed examiners' reports to schools but did not evaluate their usage for classroom instruction.**

- **There are no follow ups by ZIMSEC to establish how examinations reports produced at the end of every examination marking session are being used in the classroom.**
- **The study is interested in their accessibility and use at their intended destinations in mathematics classrooms in the schools.**

- **None reception or none use of examinations report by schools destroys the whole purpose of doing the report.**

This study provides the current missing link between mathematics examiners and mathematics teachers.
Its reverse side includes enhancement of the quality of examinations markers' reports.
Examiners provide empirical evidence for examinations report writing and justify resources used.

RESEARCH QUESTIONS

The research intended to answer the following research questions

1. What is the reception rate of ZIMSEC O Level mathematics examiners‘ reports in secondary schools?

2. How do mathematics teachers perceive the utility and value of ZIMSEC O Level mathematics examiners’ reports?

Significance of the Study

- **The significance of this study lies in its potential to be a basis for a framework for improving educational practices and outcomes in Zimbabwean schools, ultimately leading to a more effective and responsive educational system.**
- **By leveraging the insights from ZIMSEC examiners' reports, schools can foster a culture of continuous improvement and excellence in education.**
- **ZIMSEC can also improve on report writing to meet teachers’ expectations**

Methodology: Sampling

A total of 132 mathematics teachers from across the country participated in the research to establish accessibility to reports in the past three years and relevance of reports in their profession

2021, 2022 and 2023

Participants were drawn from both rural and urban schools

In this research boarding schools were taken as urban schools due to resource availability

Methodology: Hybrid

Qualitative Methods

Rich contextual data

Semi-structured Interviews

Conducted with individual teachers to gain in-depth insights into their experiences with the reports.

11 teachers were interviewed

5 video calls : [3 rural 2 urban]

6 face to face : [3 rural 3 urban]

Focus Groups Discussions

Group discussions to identify accessibility, relevance, common challenges and solutions among teachers.

4 group discussions were carried out

Group 1 : 3 teachers [2 rural 1 urban]

Group 2 : 3 teachers [all urban]

Group 3 : 4 teachers [all rural]

Group 4 : 5 teachers [3 rural 2 urban]

Quantitative Methods

For broader picture of trends across larger audience

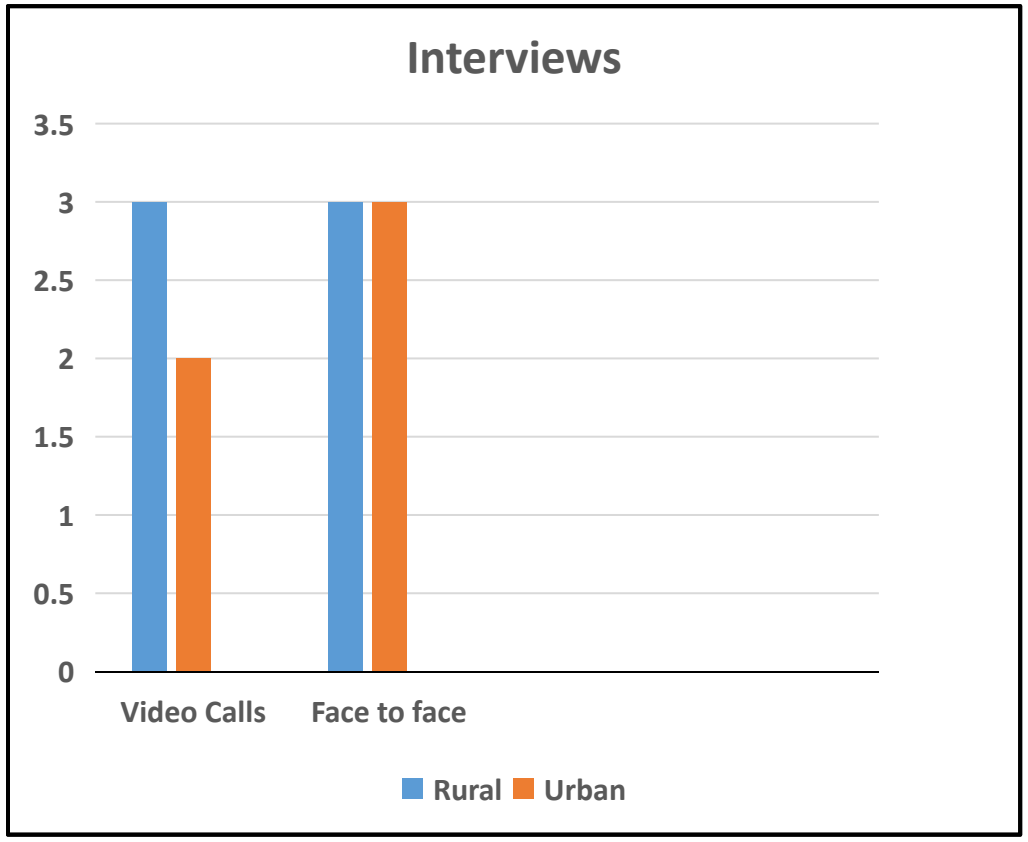
Questionnaires

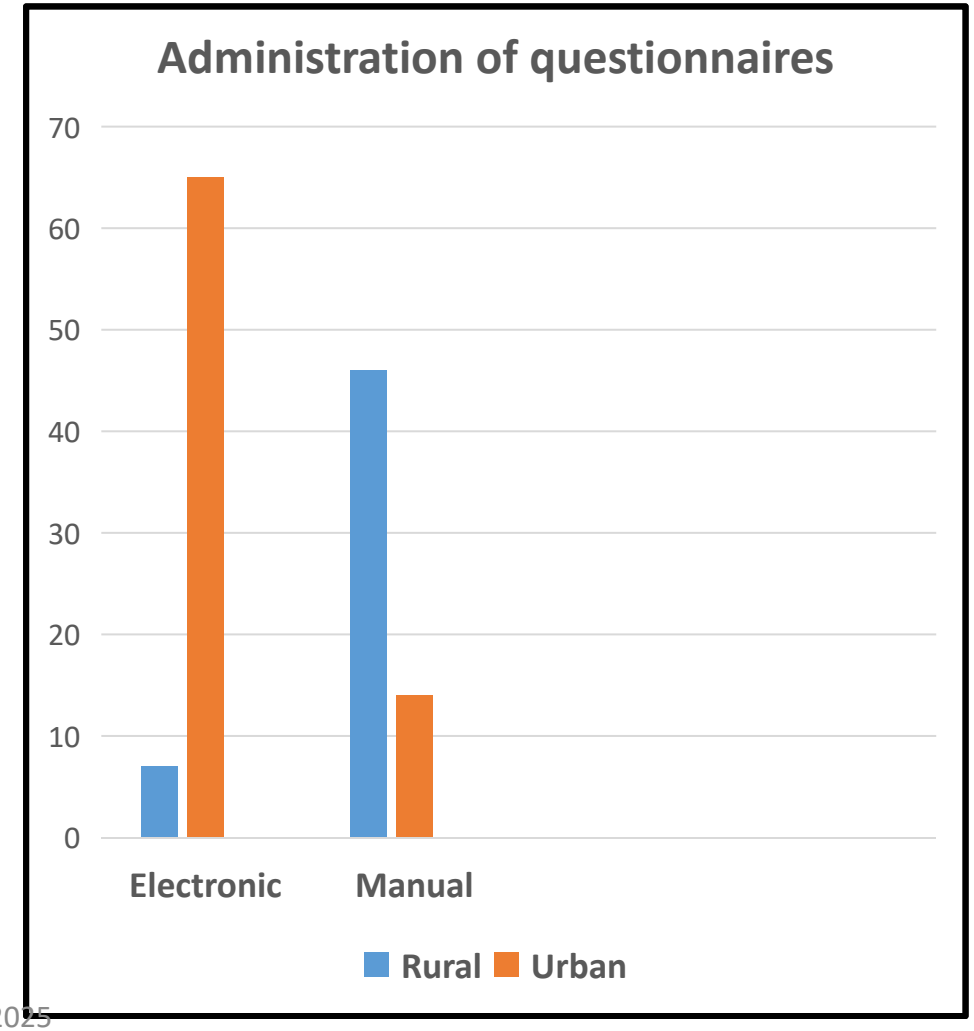
These were distributed to a larger sample of mathematics teachers to quantify their access to and use of the reports.

132 teachers completed questionnaires

- **72 electronically [7 rural 65 urban]**
- **60 manually on hard copies [46 rural 14 urban]**

Methodology: Data Collection





Data Analysis

Thematic Analysis

Coding Process: to identify and categorise themes from interviews, focus group discussions

Pattern Recognition: Look for recurring themes that reflect teachers' experiences, perceptions, challenges and recommendations.

Quantitative Analysis

- **Descriptive Statistics:** Summarized data on teacher access and usage of reports
  Frequencies were used

- **Inferential Statistics:** Chi-square tests were used to analyse relationships between access to reports and location of school

Results

- 42.4% of teachers reported accessing ZIMSEC examiners' reports.
- 43.4% of the teachers who had not accessed the reports reported that they were not aware that there were examiners' reports on the ZIMSEC website

	Questionnaires: Location of School		
Accessibility to Reports	**Rural**	**Urban**	**Total**
Accessed Reports	19	37	**56**
Not Accessed Reports	59	17	**76**
Total	**78**	**54**	**132**

FINDINGS

Research question 1

What is the reception rate of ZIMSEC O Level mathematics examiners' reports in secondary schools?

42.4% of teachers reported accessing ZIMSEC examiners' reports

Implications: Low access suggests systemic issues that may hinder effective teaching.

Chi-Square Test

•**Analysis:** Found a significant relationship between school location (urban vs. rural) and report access.

A **Chi-square test of independence**, shows a highly significant association between school location and report accessibility

($\chi^2=25.45$, df = 1, $p < 0.001$).

indicating urban teachers are more likely to access reports.

Findings

Research question 2: How do mathematics teachers perceive the utility value of ZIMSEC O Level mathematics examiners' reports?

Statistic: 60% of teachers with access rated the reports as very relevant.
•**Utility:** Reports helped identify common errors and improve lesson planning.

Discussion of Findings – Teacher use of the Reports

Teachers who accessed the reports highlighted the value of examiners' reports as stated:

- **Understanding Learner Performance**

Reports highlight areas where learners excel or struggle, facilitating teachers understand performance trends.
Diagnostic Insight: They provide insights into common misconceptions or errors, allowing teachers to target specific areas for improvement.

- **Curriculum Alignment:** By analysing reports, teachers mentioned they can ensure that their teaching aligns with assessment standards and curricular goals.
- **Resource Mobilisation:** Teachers reported that reports can guide the selection of teaching materials and resources that address identified weaknesses.

- **Instructional Strategies**

Tailored Instruction: Some teachers stated that insights from reports enable to adapt their teaching methods to better meet the needs of their learners.
By designing interventions or additional support for topics where learners commonly struggle.

- **Professional Development**

Reflective Practice: Some teachers highlighted that reviewing reports encourages them to reflect on their teaching practices and consider professional development opportunities.
- Teachers themselves can gain new approaches and understand better topics they themselves often struggle with

Discussion of Findings – Teacher use of the Reports Cont'd

Communication with Stakeholders
•**Informing Parents:** Examiners' reports help teachers communicate learner performance to parents more effectively, providing evidence of areas for improvement.
•**Reporting to Administration:** Reports support discussions with school administration about learner achievement and resource needs.

Setting Goals
•**Performance Benchmarks:** Teachers gain skills to set measurable goals for their learners based on the data provided in the reports, fostering a more goal-oriented teaching approach.
•**Monitoring Progress:** Reports allow for tracking progress over time, helping teachers adjust their strategies as needed.

Enhancing Assessment Literacy
•**Understanding Assessment Design:** Teachers gain insights into how assessments are designed, which can inform their own assessment practices.
•**Improving Question Quality:** Feedback on examination questions assist teachers develop better assessments in their classrooms.

Findings – Teacher Challenges

Teachers who had access of reports highlighted the following issues:

Interpretation of Data

Complexity: Reports can contain complex statistical data that may be difficult for teachers to interpret effectively.

Misunderstanding Results: Misinterpretation of the findings can lead to incorrect conclusions about learner performance.

Actionable Insights

Lack of Clear Recommendations: Some report do not provide specific suggestions for addressing identified weaknesses, leaving teachers uncertain about how to proceed.

Difficulty in Implementation: Even when insights are clear, translating them into actionable teaching strategies can be challenging.

Limited Time for Analysis: Teachers complained that they have limited time to thoroughly analyse reports due to heavy workloads

Need for Immediate Action: The urgency to address performance issues may not align with the time required to implement changes based on the reports.

Resource Limitations

Inadequate Support: Most schools lack the resources needed to implement changes suggested by the reports, such as additional training or materials.

Budget Constraints: Financial limitations can hinder the ability to purchase necessary resources for addressing gaps in learner learning.

Findings – Teacher Challenges

57.6% of the participant teachers did not access the reports. Teachers who did not access reports gave the following as their challenges:

Internet Connectivity Issues
Limited Access: Some teachers mentioned that they work in areas with poor internet connectivity, making it difficult to access online resources.

Lack of Awareness
Insufficient Information: Some teachers were not aware that the reports are available online and some did not know where to find them.

Technical Skills
Digital Literacy: Some teachers mentioned lack of the necessary skills to navigate the website or download the reports effectively.

Resource Limitations
Device Availability: Some teachers stated that they did not have access to devices (computers, tablets, smartphones) that allow them to browse the internet.
School Policies: Some schools have policies that limit internet usage for non-administrative purposes.

Recommendations

Framework for Integrating Reports in Instruction

Improve Dissemination:
•ZIMSEC diversify methods for distributing reports (e.g., send printed copies to schools with no/poor internet access).

Inform schools when reports are available online (the same way schools are informed of candidate registration dates and release of examination results) and provide access links

Teacher Training
ZIMSEC can hold workshops to assist teachers interpret and effectively use the reports.

Resource Provision:
- •Advocate for updated teaching materials to support the implementation of recommendations from the reports.

Encourage Collaboration:
- •Promote departmental workshops for teachers to review and discuss examiners' reports together.

Measure Impact:
- •design systems to evaluate accessibility, impact of use of reports influences on teaching quality and learner performance.

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Limitations of the Study

Potential biases in participants' responses is acknowledged, which may affect the reliability of the findings hence the need to employ other data collection methods such as observation

Generalisability

The findings may not be applicable to all contexts outside of the studied schools and teachers

Sample size can be higher

THANK YOU