# Science Teachers' Conceptual Understanding and Implementation of Components of a Lesson Plan in Primary Schools of Chibolya Zone, Lusaka District

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## ABSTRACT

This study aimed at examining the science teachers' conceptual understanding and implementation of the components of a Lesson Plan in primary schools in Chibolya Zone in Lusaka District. The study sought to describe science teachers' conceptual understanding of the components of a lesson plan, to outline what science teachers write on the components of a lesson plan and to explain science teachers' implementation of the written lesson plan. The study employed a pre-experimental survey design with a quantitative approach. To collect primary data, a questionnaire was used. This was supplemented by observations and document reviews. In selecting the respondents, purposive sampling was used. Data collected in the field was analyzed using descriptive statistics. The findings of the study revealed that the majority of science teachers either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. The findings showed that teachers had a relatively shallow conceptual understanding of the various components of a lesson plan as evidenced in the conceptual knowledge test. The findings of the study also revealed that some teachers' lesson plans did not have some components that are fundamental in science lesson delivery. Lastly, statistical evidence showed discrepancies between what was written in the lesson plans and what was being implemented during the delivery of the lesson.

**Keywords:** Practice, instruction, lesson delivery, performance, preparation, interventions.

## BACKGROUND

Lesson planning can provide opportunities for teachers to build inter-subjectivity with their students (Popham, 2013). It is true that teachers must seek for opportunities to meet their students' learning needs throughout their entire instructional activity. Although lesson planning is essential for improving learning and teaching capacity, the implementation of lesson plan in the classroom is rarely undertaken (Cullen et al., 2013). Conceptual understanding of the components of a lesson plan, among other factors, is key to effective preparation and implementation of a lesson. As such, learners can then be guided into meaningful learning that would result in learners' high academic performance.

Writing a lesson plan and all its components is one thing and understanding what each of the components of the lesson plan means and how to implement it in a classroom setup is another. Much research has been conducted on lesson planning dynamics, identifying the components of a lesson plan, the importance of a

lesson plan, delivery of a lesson and evaluation of a lesson plan (Cevikbas et al., 2023). In addition, previous studies indicate that lessons in science exhibit less adherence to what the components of the lesson plans demand (Abid, 2021). These findings implied that science teachers were not able to adhere to the demands of lesson plan components due to lack of conceptual understanding of the salient components of a lesson plan. There is an emphasis on understanding the components for a lesson plan in order to be successful in adhering to their demands as they pull together the thinking into a clear, definable classroom guide (Adam, 2014). Furthermore, Jahjouh (2014) stresses that efficient lesson delivery is a product of a well-designed lesson plan that meets the needs of the learners.

Various interventions have been undertaken by the government of Zambia on how best to raise the performance of the learners. For instance, since 2004, the Government of the republic of Zambia has worked with Japan International Cooperation Agency (JICA) to integrate lesson study, into the Zambian teacher development programmes (Robinson, 2015). In the same vein, the project for Improvement of Pedagogical Content Knowledge (IPeCK) which was a 5-year project, between 2014 and 2019, was introduced with the intent to strengthen the teacher professional development system (Ministry of General Education and JICA, 2015). Following these actions is expected to raise the learners' performance levels. However, Zazkis et al. (2009) states that planning for instruction is an important and integral part of the complex activity of teaching but learning how to plan for instruction continues to challenge teacher educators.

Despite all the strategic interventions by the government to enhance lesson planning and implementation among teachers, learners' academic performance in science in primary schools continue to be poor (Examination Council of Zambia, 2018). Furthermore, the Eastern Provincial Education Office (PEO) has observed that despite the various service training programmes, seminars, and workshops organized at school, zonal, district, provincial, and national level, learners' academic performance in science has been poor (Provincial Education Office, 2019). Therefore, this study set out to determine Science Teachers' Conceptual Understanding and Implementation of Components of a Lesson Plan in Primary Schools in Chibolya Zone of Lusaka District.

## METHODOLOGY

The study was done among teachers of integrated science of primary schools in Chibolya Zone of Lusaka District. The study sample consisted of thirty (30) teachers of integrated science from the three selected primary schools in Chibolya Zone of Lusaka District. Respondents of the study were sampled using purposive sampling technique. These teachers had received training on lesson planning both in their teacher training institutions and Continuous Profession Development (CPD) workshops organized by the Zone In-Service Training (INSET) coordinator. This study employed a pre-experimental survey design with a quantitative approach to facilitate succinct interpretations of on-site responses from various respondents. Data was collected using a questionnaire, lesson plan and lesson observation check lists. Data was analyzed by use of descriptive statistics. Theresearcherperusedthroughthedatacollectedandidentifiedinformation that was relevant to the research questions and objectives. After the summary of the findings, responses were quantified into percentages and presented in form of tables of percentages. The final overall portraits of thecrude data from different areas were interpreted and discussed. Thereafter, conclusions weredrawn. In terms of validity and reliability, the study was hinged on the transferability and the consistency of the study. The researcher aimed for credibility and the confidence in the truth of the data. To achieve member checks or respondent validation, the researcher solicited feedback on the data and the conclusions made from the research participants. Furthermore, the researcher ensured that data collection and analysis was logical, traceable and well documented. In order to meet the ethical requirements for the study, all participants in this study remained anonymous. Moreover, participants' responses were neither interfered with nor contested against by the researcher.

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# RESULTS AND DISCUSSION

### Science teachers' conceptual understanding of the components of a lesson plan

Regarding science teachers' conceptual understanding of the components of a lesson plan, the researcher made use of a five-point scale with; 1 = I do not understand it and I do not implement it; 2 = I understand it but, I do not implement it; 3 = I do not understand it but, I implement it; 4 = I partly understand it and I partly implement it; 5 = I understand it and I implement it in order to collect data. Table 1 shows that most teachers had a conceptual understanding of the components of a lesson plan, but did not implement them. Specifically, on average 27% of the teachers indicated that they understood the components of a lesson plan but did not implement them. On the other hand, 20% of the teachers indicated that they did not understand the components but implemented them and 19% of the teachers indicated that they understood the components as well as implementing them. This entails that most of the teachers possessed the conceptual understanding of the components of the lesson plan but could not implement them.

Table 1: Teachers' percentage ratings of their conceptual understanding and implementation of the performance areas of a lesson plan

| **Performance Area** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| **Preliminary Details** | 17 | 30 | 30 | 7 | 17 |
| **Specific Learning Outcomes** | 20 | 33 | 23 | 3 | 20 |
| **References** | 30 | 37 | 20 | 13 | 0 |
| **Teaching and Learning Materials** | 10 | 7 | 17 | 30 | 37 |
| **Rationale** | 13 | 50 | 13 | 17 | 7 |
| **Pre-requisite Knowledge** | 27 | 30 | 20 | 7 | 17 |
| **Start of the Lesson** | 20 | 27 | 23 | 13 | 17 |
| **Lesson Development /Progression** | 23 | 20 | 33 | 17 | 7 |
| **Ending the Lesson** | 0 | 7 | 0 | 40 | 53 |
| **Lesson Evaluation** | 20 | 30 | 23 | 17 | 10 |
| **AVERAGE (%)** | **18** | **27** | **20** | **16** | **19** |

Source: field data

The key finding, as evidenced in the study, indicated that the majority of science teachers (27%) either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. This finding resonated with Tashevska (2008) who found that teachers had issues with timing their lesson activities, sequencing these activities and anticipating problems that could occur while teaching. For example, the majority of respondents did not understand the preliminary details component of a lesson plan but implemented it while the other majority understood it but did not implement it. A close look on this finding revealed that science teachers had variation in understanding of the components of a lesson plan. The reason might be connected with the fact that the teachers were not formally inducted on the importance lesson planning to which might have led to their lack of strict adherence to the pedagogical principles of effective teaching. This is in agreement with

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Mutton et al. (2011) who states that lesson planning depends on a practical and ideological context. The need to train student teachers in lesson planning has an even more heightened relevance in the sub-Saharan nations' context today as the adoption of the Competency-Based Approach in recent years has led to changes in curricula.

**What science teachers write on the components of a lesson plan**

Regarding what science teachers write on the components of a lesson plan, the researcher made use of an observation schedule in which the ten components of the lesson plan namely Preliminary Details, Specific Learning Outcomes, References, Teaching and Learning Materials, Rationale, Pre-requisite Knowledge, Start of the Lesson, Lesson Development and Progression, Ending the Lesson and Lesson Evaluation were used to rate the contents of science teachers' written lesson plans. The researcher used a five-point scale with starting from 0 to 4 to rate each performance item on the component of the lesson plan.

In table 2, the teachers were rated on how they prepared the lessons. The rating descriptions were different for each component. The ratings were from 0 to 4, with 0 as the list performance or even missing while 4 was the best practice expected on each component. Table 2 shows that the teachers were rated medium in writing the components of a lesson plan. On average, 33% of the teachers were rated at 2 on the scale rating of 0 to 4.

Table 2: Teachers' ratings in percentages of the lesson plans checked in relation to the lesson plan components as performance areas.

| **Performance Area** | **0** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| **Preliminary Details** | 3 | 27 | 40 | 20 | 10 |
| **Specific Learning Outcomes** | 23 | 20 | 30 | 17 | 10 |
| **References** | 13 | 30 | 23 | 30 | 3 |
| **Teaching and Learning Materials** | 13 | 30 | 27 | 20 | 10 |
| **Rationale** | 10 | 17 | 40 | 27 | 7 |
| **Pre-requisite Knowledge** | 10 | 3 | 40 | 30 | 17 |
| **Start of the Lesson** | 0 | 20 | 33 | 23 | 23 |
| **Lesson Development /Progression** | 3 | 17 | 37 | 23 | 20 |
| **Ending the Lesson** | 0 | 10 | 20 | 33 | 37 |
| **Lesson Evaluation** | 17 | 27 | 37 | 10 | 10 |
| **AVERAGE (%)** | **9** | **20** | **33** | **23** | **15** |

Source: field data

It was found that most teachers (33%) scored medium scores implying that the contents of the lesson plan were not satisfying the standards of a good lesson plan. However, it should be highlighted that some of the components such as start of the lesson, lesson development and end of lesson were appropriately written by the majority of teachers. The rest of the components of a lesson plan were poorly written. This finding is in line with Matimolane and Sanders (2004) who contended that there are concerns that the planning of many teachers may be inadequate, which could be a factor inhibiting some teachers from meeting planning requirements such as designing lessons around outcomes; using learner-centred and activity-based approaches that involve the development of skills; and including continuous assessment which contributes to the learning process.

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**Science teachers' implementation of the written lesson plan**

Lastly, the study sought to explain science teachers' implementation of the written lesson plan. In order to achieve this, the researcher made use of an observation schedule with performance items namely; Start of the Lesson, Learning Activities, Utilization of Teaching and Learning Materials, Teaching Strategies and Ending the Lesson using a five-scale rating of 0 to 4.

Table 3: Percentages of the ratings of how the teachers delivered the lessons

| **Performance Area** | **0** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| **Start of the Lesson** | 10 | 17 | 20 | 30 | 23 |
| **Learning Activities** | 7 | 13 | 30 | 30 | 20 |
| **Utilization of Teaching and Learning Materials** | 13 | 37 | 30 | 17 | 3 |
| **Teaching Strategies** | 17 | 37 | 27 | 13 | 7 |
| **Ending the Lesson** | 0 | 13 | 17 | 30 | 40 |
| **AVERAGE (%)** | **9** | **23** | **25** | **24** | **19** |

Source: field data

Table 3 shows that on average, the teachers were rated as medium, which is the score of 2. More specifically, 25% of the teachers were rated at 2. In addition, 24% were rated at 3 while 23% were rated at 1. On the other hand, only 19% were rated at 4 and 9% were rated at 0. Table 4 below shows the meaning of the rating at 2 for each performance area in implementing a lesson plan.

Table 4: Percentage rating of the teacher's ratings at 2 for each of the performance areas in implementing a lesson plan.

| **Performance Area** | **Rating at 2** |
|---|---|
| **Start of the Lesson** | Provided a narrative introduction |
| **Learning Activities** | learners (individual/pair/groups) engaged (minds-on/hands-on/hearts-on) in an activity/scenario and made presentation to the whole class, |
| **Utilization of Teaching and Learning Materials (TLMs)** | TLMs available and are appropriate; Learners understand provided TLMs; Teacher demonstration |
| **Teaching Strategies** | **Includes any two of the following**:<br><br>Uses differentiated teaching strategies; promotes cooperative learning; Utilizes technology to promote learning; employs enquiry-based strategies; and graphic organizers |
| **Ending the Lesson** | Teacher summarized the main points of a lesson |

Source: field data

Based on that observation result, the study identified five aspects in the implementation of written lesson plans; Start of the Lesson, Learning Activities, Utilization of Teaching and Learning Materials, Teaching Strategies, and Ending the Lesson. The study revealed that there were discrepancies between what was written in the lesson plans and what was being implemented in the development of the lessons. The findings of the study are consistent with Garrison and Kanuka (2004) who noted that although the lesson plan is

essential for improving teaching and learning capacity, in practice, the implementation of lesson plan in the classroom is rarely practiced. This also concurs with Artaya (2018) findings that despite the importance of the lesson plan, in practice, its implementation in the classroom is infrequent. The literature often reports that having no knowledge of making lesson plan is the main challenge to make and implement lesson plan-induced session in the classroom.

The findings of this study have instructional implications related to science teachers' conceptual understanding of the components of a lesson plan. It is evident from the findings in this research that the majority of science teachers either possessed knowledge of the components but failed to apply them in practice, or lacked understanding of the components but still incorporated them into their lesson preparation. These findings have important implications on teachers' conceptual understanding as well as implementation of the lesson plan in lesson delivery. For example, teachers need to develop working values to show professionalism in their work through thorough planning.

Furthermore, the results of this study resonate with the tenets of practitioner framework elaborated in the first chapter of this study. For example, teachers' low conceptual understanding of some of the key components of the lesson plan were manifestations of lack of interrelation between concepts and practice perspectives by the participants of the study. According to Schwartz (2015), the ideal scholar practitioner interrelates concepts, understandings, and methods from varied theoretical and practice perspectives. Furthermore, the teachers' failure to provide detailed conceptual descriptions of the components of the lesson plan was due to their low prior knowledge about the lesson plan and how to effectively use if for lesson delivery. Based on these findings in relation to theory, the researcher was of the view that teachers need to become practitioners so as to be driven by personal values, commitment, and ethical conduct.

## CONCLUSION

Based on the findings, the study concludes that most science teachers either understood the components of a lesson plan but did not implement them or that they did not understand the components but implemented them in the development of lessons. This implied that teachers had shallow conceptual understanding of the various components of a lesson plan as evidenced in the findings. The study further concludes that lesson plans lacked details in various components as demonstrated in lesson plan checklists. Lastly, there were discrepancies between what was written in the lesson plans and what was being implemented during lesson delivery.

## RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

- It is recommended that policy recommendations could be suggested to introduce micro teaching as a potential development for student teachers that instructors could exploit to develop their trainees' acquisition of teaching skills.
- It is recommended that there should be clear teacher requirements in schools in terms of the appropriate designing of lesson plans by teachers.
- In strengthening compliance to lesson plan implementation, more classroom inspections should be undertaken.

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