

**PUPILS' UNDERSTANDING OF SAPONIFICATION AND
ITS APPLICATION TO EVERYDAY LIFE**

By

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fulfilment of the requirements for the degree of
Master of Education in Science Education**

**THE UNIVERSITY OF ZAMBIA
School of Education
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DECLARATION

I, Foster Mwanza, hereby do declare that this dissertation represents my own work, and that it has not previously been submitted for a degree, diploma or other qualification at the University of Zambia or any other University, and that all sources have been acknowledged.

SIGNATURE

DATE

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CERTIFICATE OF APPROVAL

This dissertation of FOSTER MWANZA, entitled PUPILS’ UNDERSTANDING OF SAPONIFICATION AND ITS APPLICATION TO EVERYDAY LIFE, has been approved as fulfilling the requirements for the award of the Master of Education in Science Education by the University of Zambia.

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ABSTRACT

One major difficult pupils experience in science classes concerns the science that they learn having no immediate link or appeal to what they use, see or touch in everyday life. The science, particularly chemistry, learnt in this way is always considered difficult and abstract by the pupils.

A phenomenological case study, to elicit the essence of the phenomenon from the pupils' own understanding and meaning making process of phenomena was used to investigate their knowledge and understanding of the saponification concept and its link to soap-making phenomenon. Data was initially collected using semi-structured open-ended written interviews to capture pupils' basic knowledge and theoretical understanding on saponification in written form. Observation of a pupils' empirical project on soap-making was also used, in which they endeavoured to demonstrate their ability to apply their understanding of saponification, while the focus group interview was used after the pupils' empirical project. Semi-structured interviews with four science teachers of varying degrees of experience (both for senior and junior level) were used to corroborate the findings from the pupils on the teachers' approach and facilitation role on saponification. Content analysis and interpretive phenomenological analysis were used to analyse the data. While content analysis gave rise to categories of pupils' understanding, the phenomenological analysis was presented mostly verbatim and used to interpret the meaning-making from the pupils' own point of view.

The main findings of the study indicated that many pupils acquired low levels of understanding on saponification, detached from the pupils' familiar perspectives. Consequently, their knowledge was largely based on what seemed more of memorised, mixed-up or unconsolidated scientific facts, mainly acquired through individual or own study as personal efforts towards examination preparations for this not frequently examined scientific concept. Hence, most of the pupils remained uncertain or unclear about saponification and what it could be used for in real life throughout their science learning experience. The empirical project done by some pupils in this research brought to the fore a lot other interrelated scientific concepts in practice. Through their rich interaction with the commonly experienced materials, pupils who took part in the soap-making felt that they were made to acquire an enhanced understanding of what was mostly learnt as pre-packed knowledge (as determined by the teacher) in classrooms, destined for examination and theory-building as preparation for higher classes. It was thus evident that where any such opportunity exists to use local materials, pupils should explore the commonly experienced phenomenon and later systematically move to scientific concepts in order to develop deep understanding of the related scientific concepts.

Since the curriculum dictates both what is taught and how learning and teaching takes place, it is recommended that the curriculum should not remain theoretical in the approach to science but should

address some practical and authentic connection of scientific concepts to everyday life, as a starting point for pupils to begin to appreciate science, more so chemistry and link it to familiar daily context.

DEDICATION

To my dear ones

In loving memory of Javison W. Sakala, for his unweathering encouragement and support during my lifetime of studies. What an anchor that he was in the family; blunt and yet accommodating to all. He always encouraged me to aim higher in my studies for a better future. He was a cousin, a brother, “mother”, friend and indeed everything to me. Little did I know that we were having our last long chat, a day before I left for Norway to receive supervision for my masters’ programme. I will always remember him fondly.

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LIST OF ABBREVIATIONS AND ACRONYMS

AFCLIST – African Forum for Children’s Literacy in Science
and
Technology.

AIDS– Acquired Immune Deficiency Syndrome

CDC – Curriculum Development Centre

HIV– Human Immuno Deficiency Virus

JETS- Junior Engineers, Technicians and Scientists

MoE – Ministry of Education

NRC– National Research Council

PTA– Parent Teacher Assocition

SCORE - Science Community Representing Education

STS – Science-Technology-Society