



**BINDURA UNIVERSITY
OF
SCIENCE EDUCATION**

Faculty of Science Education

Department of Science and Mathematics Education

**Teaching the concept 'Personal hygiene' through project-based learning at Form
One Combined Science Level**

BY

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A dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Science Education Honours Degree in Biology.

ABSTRACT

In developing countries especially in Africa and Zimbabwe in particular project-based learning approach is in its infancy stage because teachers are used to the lecture method. There is dearth of information on the application of PBL at secondary school level in combined science since most studies done in Zimbabwe are on tertiary institutions and learning areas like History. Test scores of Form One learners in the topic Personal Hygiene were very low having an average mark of 45 percent as compared to other topics with 50 percent average mark. Lecture method is currently employed in teaching Personal Hygiene at Form One. The study aims to investigate the impact of Project Based Learning (PBL) on learners' achievement on the topic personal hygiene at Form One. A quasi-experimental research design in the form of non-equivalent control group was used in the study. The target population of the study was 90 Form One learners. Form One Orange class was used as experimental group and Form One Green class was the control group. All learners wrote the pre-test. After the pre-test, the experimental group was taught the topic Personal Hygiene using Project Based Learning. The control was taught the same taught through traditional method. Post-test was written after teaching the topic Personal Hygiene using different teaching methods as stated above. In determining the sample the researcher used the already existing Form One classes. The researcher used pre-test and post-test as the research instruments. Data obtained was coded and analysed in SPSS version 29 for windows at 95% confidence interval. Results showed that PBL improve learners' performance as evidenced by 69.86 percent mean of experimental group on post-test as compared to 48.15 percent of the control group. Furthermore the P value of 0.000 was smaller than the Chi-square value of 0.031 hence rejecting the hypothesis that Project-Based Learning has no impact on learners' academic performance. The study recommends that teachers should use Project Based Learning in teaching personal hygiene at Form One since the teaching method improves learners' performance.

DECLARATION

I declare that the dissertation on **Teaching the concept ‘Personal hygiene’ through project-based learning (PBL) at Form One Combined Science Level** is my original work. All the work of other people has been dully acknowledged and this research has not been previously presented at this University or any other University for similar purposes.

NAME

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SIGNED

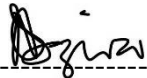
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APPROVAL FORM

The undersigned certify that they read and recommended to the **Bindura University of Science Education** for acceptance, a dissertation entitled: **Teaching the concept 'Personal hygiene' through project-based learning (PBL) at Form One Combined Science Level.**

This project is submitted by **EDSON ZVIDZAI MANDIZVIDZA** in partial fulfilment of Bachelor of Science Education Honours Degree in Biology.



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DEDICATION

This project is dedicated to my wife Christine Musavengana for her unwavering support both financially and motivationally. She unconditionally accorded me time to concentrate on my studies.

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ACRONYMS

PBL- Project Based Learning

CHAPTER ONE INTRODUCTION

1.0 Chapter Introduction

The education sector is currently faced with a series of changes and reforms and combined science as a discipline has not been spared in this revolution. Numerous teaching strategies have been developed which corresponds to the accommodation of students' needs and diverse learning methods. One such strategy which is being used is Project Based Learning as a critical teaching and learning method in the new curriculum framework. This chapter introduces the research problem, the statement of the problem, research questions and significance of the study. The chapter also provides boundaries and constrains under which the study was conducted as well as assumptions and concludes with a summary.

1.1 Background of the study

Many people world-wide are dying from fatal diseases like COVID-19 pandemic, cholera, typhoid, and many others. Zimbabwe among other countries has also been deeply affected by these pandemics. Most of the suggested remedies towards eradication of these outbreaks can be achieved simply through teaching people 'personal hygiene'. There is need to find the most appropriate approach of teaching this concept. The shift to learner centred approach in traditional classroom settings is a complex challenge in most countries (Condliffe, 2017, Culclasure, Longest and Terry 2019). This is mainly because learner centred pedagogy in general and project-based learning in particular require teachers to shift from traditional didacticism and move towards inquiry based approaches. Major and Mulvillill (2018) argue that learner centred pedagogy and Project Based Learning have not been popular with teachers and learners who are used to orthodox classroom practices and summative high stakes examinations.

Grant (2011) purports that Project Based Learning was introduced long back in developed countries but its implementation remains a challenge. Most teachers in developed countries resort to what they are used to do since they drill students to pass examinations. For instance in USA Culclaire (2019) found that two schools out of the three they used in their study abandon project-based learning after only one year of implementation. On a positive note, in developed countries where the internet is often available, learners can conduct an internet based research project as compared to their counterparts in developing countries.

Project Based Learning in developing world and Africa in particular, is still in its infancy and struggle to take roots in the classroom (Tabulakwa, 2013 and Taylor and Robinson, 2019). Most African schools are still heavily dependent on teacher dominated teaching strategy. For instance in Botswana most teachers do not use learner centred method because they were trained using the lecture method (Major and Mulvihill, 2015). Taylor and Robson (2019) found the same scenario in Kenya, Uganda, Ghana and Mali since teachers believe that knowledge is fixed, objective and detached from the learner. They also believe that it is the teacher's function to transmit knowledge to children through rote learning.

Regardless of poor network facilities, developing countries can utilise project based learning for their benefit. For instance in poor peri urban area in Western Kenya where there is no tap water two high school science students used recycled plastic containers and cheap metal to produce a prototype hand washing machine which is operated by foot to reduce the spread of Covid 19 (Wanzala, 2020).

Zimbabwe was not left out in this race of implementing Project Based Learning since the country experimented with this approach in the secondary schools through the Competence Based Curriculum Framework (2015-2022) currently under implementation. Chimbi and Jita (2021) carried a research on the implementation of project-based learning in four urban schools

in Chitungwiza area focusing on project-based learning in History. Their finding indicated that implementation of project based learning in the country remains a talk not a walk due to several challenges. There is dearth of information on the implementation of project based learning in rural schools of developing countries especially in combined science.

Besides the above historical background the researcher observed that most teachers use teacher centred approach when teaching the topic. Also the mark list of the form one classes of 2022 showed low pass rate of 35 percent and 38 percent for Form 1 Green and Form 1 Orange respectively. This was far below the other topics that have a low pass rate of 46 percent.

1.2 Statement of the problem

Research indicate that the project-based learning (PBL) is the best solution towards improvement of students' academic performance especially in developed economies (Thomas 2000). Apart from improving academic performance of learners, the project-based learning uses problem solving scientific approach to address the prevailing world problems such as the COVID-19 pandemic. There is no study carried out investigating the impact of PBL on the teaching and learning of Personal Hygiene within most public schools in Makonde District, particularly Murereka High School, where academic results are low. Personal hygiene was selected in the study because the researcher observed very low pass rates on form one marks in 2021 when teaching the classes as compared to other topics where learners scored above 45 percent.

1.3 Research objectives

The study has the following specific objectives:

1.3.1 To compare the effectiveness of project-based learning approach and the traditional learning one.

1.3.2 To examine the effects of project-based learning to the teaching and learning of process.

1.4 Hypothesis

H₀ Project-based learning has no impact on learners' academic performance.

H₁ Project-based learning has an impact on learners' academic performance.

1.5 Assumptions of the study

The research was based on the following basic assumptions: It was assumed that the respondents would give accurate and honest information and that the school administration would provide the necessary needed support for the teaching and learning of combined science at form one. Also it is assumed that participants' gender did not significantly affect their perceptions

1.6 Significance of the study

Policy makers in the Ministry of Primary and Secondary Education

This study could help them to come up with informed decision on strategies to implement Project based learning policy in the teaching and learning of combined science at form one as there are aware of the challenges faced in the implementation of learner centred approaches.

Schools inspectors

They could use the study as guide on items to consider during their supervision so as to improve the adoption of learner centred methods in combined science at form one.

School Heads

They could use the study as a base to enforce the use learner centred methods in the teaching and learning of combined science at form one.

Teachers

They could benefit from the study as they will be aware of the challenges of Project Based Learning in the teaching and learning of science at form one.

Learners

Learners could use the research to improve their performance since they will be aware of the benefits of Project based learning.

The researcher

The researcher can use the study to improve his teaching and research skills since he obtained great knowledge on benefits of project based learning in combined science.

Other researchers

They could use the study as reference material when doing research in other secondary schools or learning area.

1.7 Limitation of the study

While the maximum effort was made for exceptional accuracy the research was vulnerable to the following hurdles:

- ❖ Time Limitations- The researcher was a full time classroom teacher hence balancing school work and research require more time. The research limited his study to form one class at Murereka High School to reduce travelling time to gather data since he was teaching the class.
- ❖ Lack of financial and human resources needed to enable the study to cover the whole district - the researcher had limited capital to print many questionnaires and travel to other schools in the district hence the data was collected through interviews and focused on the sample selected.

- ❖ Private policy- Some of the information at the schools was private and confidential and not accessed easily. The researcher assured the sources that the information was used for academic purposes only specifically for this research and there was no mentioning of names. Furthermore the information was treated as private and confidential.
- ❖ Due to the length of the study, a significant number of respondents available in the preliminary testing were unwilling to participate in the final stage of testing. The researcher persuades them to continue taking part in the study.

1.8 Delimitations

The research was carried out at Murereka High School in Makonde District, Mashonaland West province. The school is located in rural area where most people earn a living through subsistence agriculture and artisanal gold mining. The research was confined to form one Green and form one Orange classes doing combined science only. Both classes have learners of mixed ability because the school does not stream learners at form one. As a result the researcher did not consider the performance of learners in selecting the sample and only focused on the effectiveness of project based learning in the teaching and learning of combined science.

1.9 Definition of key terms

Combined Science- is a learning area introduced in the competency based curriculum in Zimbabwe that gives learners opportunity to study Chemistry, Biology and Physics as one learning area.

1.10 Chapter Summary

This chapter introduces the study by looking at background of the study from worldview, regional and national level so as to attain a funnel approach. PBL has a long history in developed countries and in developing country it is in its infant stage. Statement of the problem highlighted that there is no study carried out in Makonde district to examine the

impact of PBL on the teaching and learning of Personal Hygiene at Form One Combined Science Level. The objectives of the study are to compare the effectiveness of project-based learning approach and the traditional learning one and to examine the effects of project-based learning to the teaching and learning of process. The hypothesis consists of; H_0 Project-based learning has no impact on learners' academic performance and H_1 Project-based learning has an impact on learners' academic performance. The study was carried out at Murereka High School in Makonde District with form One Orange and One Green. The study is made up of five chapters that is chapter one to five. The following chapter (Chapter two) reviews literature from various researchers on what is project based learning and the benefits of the approach. Chapter 3 gives the methodology and approaches used to gather data in the study, population, sample, and sampling techniques. Chapter 4 is where the results of the study are presented, analysed and discussed. Lastly chapter 5 gives the summary of the study, conclusions and recommendations based on the research findings.

CHAPTER TWO REVIEW OF RELATED LITERATURE

2.0 Introduction

The main thrust of this chapter is to provide what the authorities say about the use of project-based learning (PBL) in the teaching and learning of the concept 'Personal hygiene' in Combined Science subject at form one. Thematic approach of reviewing related literature is adopted basing on the research questions in Chapter one. Review of related literature begins

by describing project based learning focus on the definition, origin and characteristics. After that the use of project based learning in developed and developing countries is compared. The third section discuss project based in teaching and learning of combined science. The fourth section review literature related to the challenges of project based learning in combined science. Summary of the chapter is the last section of chapter two that summaries the key points and introduce chapter 3.

2.1 Overview of Project-based learning

Defining Project Based learning is problematic as, Hanney and Saving-Baden explain that the term is broad, far reaching and means different things in different countries and disciplinary areas. Stanffacher (2006) argue that PBL is closely related and sometimes interchangeable to problem based learning or included under umbrella terminology like inquiry based approach. According to Speziale (2020), project-based learning is an instructional approach designed to give students the opportunity to develop knowledge and skills through engaging projects set around challenges and problems they may face in the real world. Abdo (2020) argues that project-based learning is a teaching approach that allows learners to gain knowledge through requiring them to work for a long time to investigate a complex problem or question.

Kwietniesky (2017) proposes that Piaget, Vygotsky, and Dewey are the theorists mostly credited with the development of project-based learning. Some of the main theories are Piaget's theory of Constructivism, Vygotsky's theory of Social Constructivism and John Dewey's theory of Progressivism. However, Dewey is regarded as the father of project-based learning

Many key features of project based learning make the teaching method unique to traditional teaching methods. Project based learning emphasise learning by doing where learners put

theory into practice as suggested by Dewey. The learners' role changes from learning by listening to learning by doing (Staiffacher et al, 2006).

The other feature of Project based learning is real world problems. Bell (2010) argues that the real world task is central to the practice of PBL across the disciplines. The connection between academia and external social, political and environmental realities is argued to engender and sustain learners' interest and motivation. The problem to be solved by project based learning must be complex and open ended in order to permit a range of possible solutions and responses.

Furthermore project based learning shifts the role of the teacher from sage-on-the stage to guide-on-the side (Danford, 2006). The teacher in project based learning performs the role of a facilitator and his/her role change from a distributor of knowledge to a process manager, helping learners in their learning process. Frank and Elata (2003) purport that In Project Based Learning the teacher acted as a supervisor or moderator.

2.2 Project-based learning in developed and developing countries.

Kolmes (2009) argue that Project based learning has increasingly been tried and adopted across diversity of educational institutions worldwide. PBL was used long back in developed countries where the internet is often available (Grant, 2011). For instance in Denmark PBL was used in engineering to solve real world problems. However Bell (2011) argues that the implementation of Project Based Learning still remains problematic in developed nations hence more research is needed to determine the effectiveness of PBL in developing countries like Zimbabwe especially in rural schools like Murereka. The nature of Problem associated with Project Based Learning forced two of the three public schools in the USA to abandon PBL after only one year of implementation.

On the other hand PBL in developing countries in general and Africa in particular is in its infancy stage and struggle to take roots in the classroom (Taylor and Robinso, 2019). For instance in Botswana most teachers do not use learner centered pedagogy because they were trained using lecture method (Major and Mulvihill, 2015). In Kenya, Uganda, Ghana and Mali most teachers believe that it is the teacher's function to transmit knowledge to children through rote learning (Taylor and Robinso, 2019). Chimbi and Jita (2021) purport the in Zimbabwe project Based Learning was ushered in by the New curriculum Framework (2015-2022) currently under implementation.

2.3 Project Based learning in science teaching in secondary schools

Al-Balushi and Al-Aamri (2014), conducted a quasi-experimental study with 62, 11th grade female students (equivalent to Year 12 in the UK) in Oman that explored the effect of environmental science projects on students' environmental knowledge and attitudes towards science. Two classes were randomly assigned into an experimental group and a control group. The experimental group significantly outperforming the control group in the Environmental Knowledge Test and the Science Attitudes Survey. This shows that PBL if correctly implemented in science is likely to improve performance of learners. The authors acknowledged, however, that a novelty effect could not be ruled out as students' enthusiasm in the experimental group in using new technology to design their products could have led to the more positive results in the post-tests.

Another quasi-experimental study carried out in the US (Hsu, Van Dyke, Chen & Smith, 2015) explored seventh graders' (equivalent to Year 8 in the UK) development of argumentation skills and construction of science knowledge in a graph-oriented computer-assisted project-based learning environment. A significant difference in science knowledge, counterargument and rebuttal skills was found in favour of the treatment condition. In another US study, Geier

et al. (2008) reported that 7th and 8th grade students that participated in project-based inquiry science units showed increased science content understanding, better process skills and significantly higher pass rates on the state-wide test over the remainder of the district population.

In addition, Boaler (1998) conducted a longitudinal study of mathematics instruction comparing an open, project-based environment to a traditional approach and it followed two cohorts of students in two British secondary schools from Year 9 to Year 11. Even though this study did not involve the random allocation of participants, it employed a closely-matched control group in terms of socioeconomic status, prior mathematics instruction and attainment. A variety of instruments were used to measure students' skills, attitudes and attainment. The main finding was that the two groups developed different forms of knowledge. The students learning mathematics in the project-based environment developed conceptual understanding which often required creative and deeper thinking in contrast to the procedural knowledge acquired by the traditional instruction group which was mainly based on information recall. In addition, more students at the project-based school succeeded in passing the General Certificate of Secondary Education (GCSE) at the end of the three-year study than those students receiving the traditional instruction.

Other studies have shown higher learner motivation in a project-based learning environment with fourteen and fifteen-year-old girls in Israel showing increased interest in learning scientific-technological subjects (Barak and Asad, 2012). Project-based learning as related to STEM (science, technology, engineering and mathematics) curriculum design for female senior high school students in Taiwan led to gains in terms of enjoyment, engagement with the project and the ability to combine theory and practice effectively (Lou, Liu, Shih & Tseng, 2011). This study was an in-depth investigation of 84 students' cognition, behavioural

intentions and attitudes in the project-based STEM environment and involved text analysis and questionnaire survey as the main data collection tools.

The 10-11-year-old students in ChanLin's (2008) qualitative study in Taiwan developed skills in synthesising and elaborating knowledge and in engaging in scientific exploratory talks with the use of technology. Project-based learning has also been explored as a method of instruction with low-achieving students in Israel (Doppelt, 2003) and the US (Cuevas et al., 2005), and with second chance school students in Greece (Koutrouba & Karageorgou, 2013) with positive outcomes. Doppelt (2003) found that scientific-technological project-based learning helped improve low-achieving students' motivation and self-image by allowing students to succeed early on in the process and led to more students achieving the college admittance requirements. Doppelt's study was a field research project that used qualitative and quantitative tools (portfolio analysis, observations, interviews, matriculation examination results and assessment of students' projects) with a sample of 54 10th to 12th grade students (fifteen to eighteen years old).

Encouraging results were also reported with high school high achievers in Israel where 60 students from three experimental classes in comprehensive high schools exhibited a significant increase in formal technological knowledge and skills and more positive attitudes towards technology in comparison to the students in the three control classes which were drawn from technological high schools (Mioduser & Betzer, 2007). However, the different studies suggested differences in student take-up and characteristics and indicate an unequal student comparison which limits the strength of the findings. Some studies have shown mixed results. For example, in their quasi-experimental study with 13-year-old children (grade 8) taking computer courses in Greece, Boubouka and Papanikolaou (2013) found no significant effect of

project-based learning on student achievement but a statistically positive effect on self-perceived learning performances.

Learner autonomy and motivation are increased through project-based learning curriculums Kwietnieski, (2017). Autonomous learning is the process through which learners are allowed to choose what and how they learn (Chalupa and Haseborg, 2014). Project-based learning is effective as a learning method as it has the capacity to engage all students in extended learning, gaining success through meaningful, collaborative, and hands-on projects (Buck Institute for Education, n.d.) in Fall (2021). Project-based learning has been proven to improve students' critical thinking skills, build confidence, increase learner responsibility, and prepare them for college readiness (Larmer, et al., 2015) in Fall (2021).

Bell (2010) in Fall (2021), view PBL as a tool to increase motivation and engagement of learners from different backgrounds. Also adds that PBL keeps learning meaningful as it exposes learners learning by doing. Bell (2010), again stresses that PBL arouses natural curiosity of learners because it is an inquiry-based type of learning. Through opportunities to seek their own learning, learners develop intrinsic motivation for pursuing their own interest in a topic. Mosier, et al (2016) in Fall (2021), reported high levels of learner engagement related to learning through relevant projects, and stated that when learners felt the learning was “relevant to their lives outside the classroom and applicable to their future education or career trajectories”, it made a positive impact on their learning.

Project based Learning also benefits the teacher as noted by Helle, et al, (2006), that, project-based learning as a form of instruction has clear link with other pedagogical approaches, such as, the problem-based learning among others. There are many benefits for educators related to incorporating PBL in the classroom. First of all, PBL helps teachers to collaborate, providing new opportunities for them to work together to innovate and overcome the

traditional isolation associated with the profession. PBL can provide opportunities for professional development, which meets teachers' 21st century needs, building skills such as project management, informational literacy, and interdisciplinary instructional design.

Teachers with the skills of a project manager ensure success through time management, and seeing that each student is contributing equally to the project (Boss & Krauss, 2007). As a result of professional development opportunities, Thomas (2010) has discussed "enhanced professionalism and collaboration" as unintended and beneficial consequences of PBL (p. 36). Many resources are available for teachers through multimedia digital platforms such as Edutopia and Buck Institute to become experts in the implementation of PBL (Boss & Krauss, 2014). Increased collaboration and professional development with the help of various resources are some of the benefits for educators using PBL.

The other benefit of PBL for teachers involves creating opportunities for new learning and community building. With PBL, teachers broadcast their class' projects publicly, which can benefit other teachers in the vicinity and help them obtain useful feedback in order to better meet instructional goals in the future and build community connections (Boss & Krauss, 2007). PBL helps teachers to build bridges between students and the outside world, opening doors and possibilities for new learning (Boss & Krauss, 2014).

Larmer (2010) also discusses how audiences, including family and community members, should attend the publication of the projects. The presence of community members and other educators can provide teachers with leverage and support, building pride and meaningfulness around the project, as well as opening opportunities for teachers to gain funding for future projects. Additionally, if students are approached by visitors, they are able to explain their work in progress and how learning as a group is beneficial (Boss & Krauss, 2007). School leaders can also help PBL be successful by encouraging teachers to share

their project plans in a digital library. Public sharing of projects can help others to learn from their experiences and modify projects to meet future learners' needs and instructional goals.

Many practical constraints of PBL include fixed and inadequate resources, inflexible schedules, and incompatible technology. Blumenfeld et al. (1994) in Fall (2021), add that class size, composition, and strict curricular policies to the challenges of enacting PBL in the classroom. Another challenge for teachers using PBL is the pressure to cover all academic content in the limited time they are given. Blumenfeld et al. (1991) share that a weakness of PBL is that there must be proper time allotment for projects to be completed fully.

Projects also must remain on-track and not divert from the main topic of exploration. Teachers need to be trained thoroughly to execute PBL in a timely and productive manner. Proper timeliness and organization will lead to higher student motivation (Blumenfeld et al., 1991). Santos Green et al. (2014) emphasize that future research should consider administrative support on the implementation of constructionist learning projects, as the projects are time consuming and “place a heavy burden on teaching staff” (p. 321).

While teachers are designing PBL, they might encounter certain obstacles or challenges. Many practical constraints of PBL include fixed and inadequate resources, inflexible schedules, and incompatible technology (Blumenfeld et al., 1991). Blumenfeld et al. (1994) add class size, composition, and strict curricular policies to the challenges of enacting PBL in the classroom. Again, one of the challenges for teachers using PBL is the pressure to cover all academic content in the limited time they are given. Blumenfeld et al. (1991) share that a weakness of PBL is that there must be proper time allotment for projects to be completed fully.

Projects also must remain on-track and not divert from the main topic of exploration. Teachers need to be trained thoroughly to execute PBL in a timely and productive manner. Proper timeliness and organization will lead to higher student motivation (Blumenfeld et al., 1991). Santos Green et al. (2014) emphasize that future research should consider administrative support on the implementation of constructionist learning projects, as the projects are time consuming and “place a heavy burden on teaching staff” (p. 321).

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Teachers need to be trained thoroughly to execute PBL in a timely and productive manner. Proper timeliness and organization will lead to higher student motivation (Blumenfeld et al., 1991). Santos Green et al. (2014) emphasize that future research should consider administrative support on the implementation of constructionist learning projects, as the projects are time consuming and “place a heavy burden on teaching staff” (p. 321). Some studies of weaker quality were based on observations of students’ behaviour, attitudes and accomplishments in a project-based learning environment without the presence of a comparator group (for example, Barak & Asad, 2012; ChanLin, 2008; Cuevas, Lee, Hart & Deaktor, 2005; Morales, Bang & Andre, 2013).

2.4 Teaching personal hygiene at secondary school level

There is dearth of information on the teaching and learning of personal hygiene at secondary school level through Project Based Learning since most studies focused on the use of PBL in tertiary institutions or other learning areas like History (Kolmes, 2009, Taylor and Robso, 2015 and Chimbi and Jita, 2021).

Personal hygiene is most taught through lecture method in Botswana because most teachers were trained using lecture method and applying learner centred approach is a great challenge (Major and Mulvihill, 2015). The same teaching approach is done in Kenya, Uganda, Ghana, Mali because the teachers believe that knowledge is fixed, objectives and detached from the learner and the teacher should transmit knowledge to learners through rote learning (Taylor and Robson, 2010).

Kostkova (2009) found that story telling is useful in the teaching and learning of Personal Hygiene especially on principles of healthcare and hygiene to children. Molnar, et al (2012) argues that games such as Global Hand washing Day reinforce the importance of hygiene, focusing on microorganism's transmission.

2.5 Chapter summary

This chapter, focussed on what other authorities say about project-based learning (PBL) in the teaching and learning of the concept personal hygiene. Project based- has its roots in Piaget, Vygotsky, and Dewey learning theories. This approach has been used long back in developed countries regardless of challenges of using it. Project Based Learning is in its infancy stage in developing countries and most teachers still use lecture method in the teaching and learning at secondary level. There is dearth of information on the use Project Based Learning in the teaching of Personal hygiene at secondary school level. The next chapter, chapter three describes the research design, population, sampling procedure and research methods used to gather data.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology followed in the conduct of the research that is the adopted research design, the population, the sample and sampling procedures used. It also describes the research methods and instruments used to obtain data. The chapter also looks at ethical considerations that guided the research process.

3.2 Research design

In the development of the research, a quasi-experiment design in the form of non-equivalent control group pre-test and post-test was employed. The researcher taught Form One Orange (experimental group) using PBL whilst Form One Green (control group) was taught using the traditional method after writing a pre-test. The researcher used non-equivalent control group design because both classes were on the same topic (Personal Hygiene), offered at the same school (Murereka High School) and taught by the same teacher. However Form One Green taught using the traditional method is a non-equivalent comparison group because learners in the class were not randomly assigned to that class. After covering the whole unit on Personal Hygiene learners wrote a similar post- test for comparison of performance.

3.3 Population

The population of this study comprised of ninety Form One learners at Murereka High School in Makonde District. The learners are of mixed ability. They were placed in two non-streamed classes that are Form One Green and Form One Orange. Form One Green has 46 learners whilst Form One Orange has 44 learners.

3.4. Sample size

The researcher used all the 90 learners since it's unethical to withdraw learners from their classes for the purpose of research. All the learners were given equal opportunity to learn as part of the topic Personal Hygiene is part of the syllabus content.

3.5 Sampling techniques

Learners were selected basing on their classes. Learners for Form One Green were classified as Control Group whilst those from Form Orange were the experimental group. Learners were randomly selected into the two classes by standing in a straight line and counting 1 and 2. Those who count 1 were placed in Form One Green whilst those who count 2 were placed in Form One Orange. This was done by the deputy head and the senior teacher who were in charge of class allocation.

3.6 Data collection instruments

The researcher utilized a pre-test and post-test for the learners.

3.6.1 Pre-test and post-test

Pre-test used in the study attached as Appendix A. The test was out of 30 and converted to percentage so that comparison can be done by the post-test. The test was written in 35 minutes. Six questions were set as indicated on Appendix A where learners start by stating toiletries and cosmetics used to take care of the body in question one. In question two learners were defining the term health and hygiene. The last question asked learners to describe ways of caring for different body parts. This question took bulk of the marks that is 10 marks out of 30.

Post-test used in the study is attached to Appendix B. The test maintained same features of the pre-test in terms of time allocation and total. Also the test followed Blooms Taxonomy of

questioning. The only difference of the two tests was that post-test has a question that requires learners to explain the problems faced by people in practising good personal hygiene.

3.7 Data Collection Procedure

Data collection was done by administering pre-test and post-test.

3.7.1 Pre Test and Post Test

The researcher set and printed the tests for the participants. The pre-test was given to the learners before teaching them the topic personal hygiene. When administering the test the researcher gave learners question papers and answer sheets. He invigilated the test so that learners do not copy and refer to their note books in order to obtain a true performance of the learners. During the test learners were using their really names. After 35 minutes, the researcher collected the answer sheet and marked the scripts. After marking all the 90 scripts the research instruct learners to erase their names and write codes depending on class for confidentiality. The experimental group used LA for identification whilst control group used LB. The researcher recorded the marks of learners.

The researcher taught the topic Personal Hygiene using Project based learning in Form One Orange and traditional method in Form one Green. After teaching the lesson a post- test was applied following similar procedure to that of a pre- test for the purpose of comparison of the two tests. During lesson time learners were using their real names whilst the pseudonyms were used after all scripts were marked for the purpose of confidentiality.

3.8 Data presentation and analysis

The researcher collected all the information obtained from pre-test, post-test. The data from pre-test and post-test was coded and analysed in SPSS version 29 for windows at 95%

confidence level. Descriptive statistics such as mean and standard deviation were used. Inferential statistics such as Chi square was also used to analyse data.

Percentage pass rate, mean of the pre-test and post-tests were presented graphically, on tables.

3.9 Ethical issues

The researcher applied for permission to conduct the research from the Murereka High School administration. The school administration gave the researcher authority to do the research. The participants agreed to partake in this study by signing voluntary consent form. All learners remained in their classes and wrote the pre-test and post-tests. Also they were taught the same concept regardless of class. Plagiarism was avoided since work of others was acknowledged. Strict working hours were adhered to when conducting interviews. The participants were free to withdraw. Furthermore the researcher assured the participants that information from the research was used for academic purpose and was treated as private and confidential.

3.10 Summary

This chapter focused on the research methodology. A quasi experimental research design was used. Target population for the study was 90 Form One learners at Murereka High school. From 90 learners' scripts in the post test and pre-test, 20 scripts were used for data analysis. Interviews, Pre-test and Post-test were the research instruments used in the study. Data presentation in form of tables, pie charts and bar graphs was outline. Data analysis plan was also highlighted such as use of mean, standard deviation and Chi square for quantitative data and texts for qualitative data. On ethical issues the researcher seeks permission from school Head to do the research, participants were free to withdraw and information obtained is for academic purpose only`. In the next chapter, research findings were presented and analysed with the base for conclusion and recommendations set out.

CHAPTER FOUR DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter focuses on the presentation, analysis and the discussion of the data. The research was a mixed research hence tables, pie charts and bar graphs were used to present, analyse quantitative data. The researcher also interpreted the data in line with the objectives and literature from other researches.

4.2 Response rate

All 90 learners managed to write pre-test and post-test as planned. The test were return under examination conditions so as to prevent copying The result of the pre-test and post- test it's a true reflection of the impact of PBL on teaching personal hygiene. .

4.3 PBL and learners' performance

The researcher make use of pre –test and post to determine if PBL as an influence on learners' performance. The pre-test result for learners in the in experimental group are indicated by table 4.1 below

Table 4.1 Pre-test marks of experimental group

Mark as percentage	Frequency	Percent
36	2	4.5
37	1	2.3
38	1	2.3
40	3	6.8
41	1	2.3
42	3	6.8
43	3	6.8
44	2	4.5
45	2	4.5
47	1	2.3
48	4	9.1
49	1	2.3
50	5	11.4
51	1	2.3
52	2	4.5
53	2	4.5
54	2	4.5
56	2	4.5
57	1	2.3
58	1	2.3
62	1	2.3
63	2	4.5
67	1	2.3
Total	44	100.0

a. group = experimental

(Source Data)

The highest mark for the pre-test on experimental group was 67 percent obtained by one learner whilst the lowest mark was 36 percent scored by 2 learners. The modal mark was 50 percent

obtained by 11.4 percent of the learners. The mean of the pre-test on experimental group was 48.1 percent.

The experimental group wrote a post-test and their marks are shown in table 4.2 below

Table 4.2 Post-tests of experimental group

Mark as a percentage	Frequency	Percent
40	1	2.3
47	1	2.3
48	1	2.3
50	1	2.3
56	2	4.5
57	2	4.5
58	3	6.8
59	2	4.5
60	2	4.5
63	1	2.3
64	2	4.5
65	4	9.1
67	3	6.8
70	2	4.5
75	1	2.3
78	1	2.3
79	4	9.1
80	2	4.5
83	1	2.3
85	1	2.3
88	1	2.3
89	1	2.3
90	1	2.3
95	1	2.3
100	3	6.8
Total	44	100.0

(Source Data)

The lowest mark was 40 percent obtained by 2.3 percent of the learners whilst the highest mark was 100 percent obtained by 6.8 percent of the learners. The modal mark was 65 percent. The mean mark for the experimental group was at 69.86 percent.

Pre-test and post-test marks of experimental group in table 4.1 and 4.2 were used to calculate descriptive statistics at 95 percent significance level as shown by table 4.3 below

Table 4.3 Descriptive Statistics of pre-test and post-test of experimental group

Descriptive Statistics	Pre-test		Post-test	
	Statistic	Std Error	Statistic	Std. Error
Mean	48.41	1.144	69.86	2.250
95% Confidence Interval for Mean	46.10		65.33	
50.72	50.72		74.40	
5% Trimmed Mean	48.18		69.63	
Median	48.00		66.00	
Variance	57.596		222.818	
Std. Deviation	7.589		14.927	
Minimum	36		40	
Maximum	67		100	
Range	31		60	
Interquartile Range	11		22	
Skewness	.450	.357	.392	.357
Kurtosis	-.232	.702	-.468	.702

(Source data)

Mean mark for pre-test was 48.41 which was below the pass mark of 50 percent whilst the mean for the post test was 69. 86. This showed that PBL improved the learners' performance. Median score for pre-test was 48 percent which was again below the 50 percent mark. Post-test was having a median mark of 66 indicating that most learners managed to pass the post-test in the experimental group.

The researcher also analyses results of control group (group B) that was taught using traditional methods so as to have an objective comparison of PBL and traditional method. The results of pre-test is shown in table 4.4 below

Table 4.4 Pre-Test marks of control group taught using traditional method.

Mark as a percentage	Frequency	Percent
40	3	6.5
41	2	4.3
42	3	6.5
43	4	8.7
44	1	2.2
52	2	4.3
53	1	2.2
54	1	2.2
56	4	8.7
57	1	2.2
58	1	2.2
59	4	8.7
60	4	8.7
62	1	2.2
65	2	4.3
67	2	4.3
68	1	2.2
69	1	2.2
70	2	4.3
71	2	4.3
77	2	4.3
78	1	2.2
80	1	2.2
Total	46	100.0

(Source Data)

The lowest mark was 40 percent obtained by 6.5 percent of the learners in the pre-test of control group. Only 2.2 percent of learners managed to obtain highest mark of 80 percent. The mean of control group on the pre-test was 57.11 percent which was well above the pass mark of 50 percent.

Control group managed to write a post-test so that comparison can be drawn between results of the classes on pre-test and post-test. Post-test marks of control group are shown in table 4.5 below.

Table 4.5 Post-test marks of control group taught using traditional method.

Mark as a percentage	Frequency	Percent
20	2	4.3
23	1	2.2
25	1	2.2
28	1	2.2
29	2	4.3
31	1	2.2
32	1	2.2
40	4	8.7
43	1	2.2
45	2	4.3
46	2	4.3
47	1	2.2
48	1	2.2
49	5	10.9
50	1	2.2
52	2	4.3
53	2	4.3
54	3	6.5
57	1	2.2
58	3	6.5
59	4	8.7
65	1	2.2
68	1	2.2
70	1	2.2
80	1	2.2
81	1	2.2
Total	46	100.0

The highest mark for post-test was 81 percent obtained by 2.2 percent of the learners in the control group. The lowest mark was 20 percent obtained by 4.3 percent of the learners. The modal mark was 49 percent which is below the pass mark of 50 percent. Data from table 4.4 and table 4.5 was used to calculate descriptive statistics of the control group as indicated on table 4.6 so that the data became more meaningful in solving the problem at hand.

Table 4.6 Descriptive statistics for pre-test and post-test of control group

Descriptive Statistics	Pre-test		Post-test	
	Statistic	Std. Error	Statistic	Std. Error
Mean	57.11	1.739	48.15	2.090
95% Confidence Interval for Lower Bound Mean	53.61	43.94		
Upper Bound	60.61	52.36		
5% Trimmed Mean	56.86		47.97	
Median	58.50		49.00	
Variance	139.032		201.021	
Std. Deviation	11.791		14.178	
Minimum	40		20	
Maximum	80		81	
Range	40		61	
Interquartile Range	24		18	
Skewness	.071	.350	-.052	.350
Kurtosis	-.968	.688	.121	.688

(Source Da

The mean mark for pre-test was 57.11 which was above the pass mark of 50 percent whilst the mean for the post-test dropped to 48.15. This showed that traditional teaching method negatively affected the learners' performance. Median score for pre-test was 58.50 percent which is again above the 50 percent mark indicating that most learners passed the test. Post test

results showed a median mark of 49 percent indicating that some learners who passed the pre-test failed the post-test in the control group.

Furthermore results for pre-test and post-test differ on control group. Pre-test have a standard deviation of 11.791 whilst post-test have 14.178 percent.

The results above are attributed to lack of problem solving and communication skills. The learners faced challenges in addressing the demands of the question. Also they were not describing in some sections because there are used to rote learning through memorization.

To have a clear picture of the learners performance on the pre-test and post-test the researcher compared marks obtained by learners as indicated in Table 4.7 below

Table 4.7 Comparison of descriptive Statistics for pre-test and post-test for control and experimental groups

		Descriptive Statistics				
		N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	Control	46	40	80	57.11	11.791
	Experimental	44	36	67	48.41	7.589
Post test	Control	46	20	81	48.15	14.178
	Experimental	44	40	100	69.86	14.927

(Source Data)

From results of pre-test, learners in control group were better performers than those in experimental group. Control group managed to obtain highest mark of 80 percent as compared to the 67 percent in the experimental group. The mean mark for the control group was at 57.11 percent which is above the pass mark of 50 percent unlike the experimental group having 48.15 percent. After teaching the topic personal hygiene by PBL on experimental group the mean

mark increased to 69.8. Also the highest mark rose to 100 percent. Traditional method was used on the control group and the mean mark of post-test slightly dropped to 48.15. The highest mark increased by 1 percent to 81 percent which is gain a slight increase. Therefore the results from pre-test and post-test indicated that PBL improve learners' performance.

Post test results were used in hypothesis testing as indicated by table 4.8 and 4.9 below

Table 4.8 Group Cross tabulation of post-test in calculation of Chi-square

		group		Total
		control	experimental	
Post-test	20	2	0	2
	23	1	0	1
	25	1	0	1
	28	1	0	1
	29	2	0	2
	31	1	0	1
	32	1	0	1
	40	4	1	5
	43	1	0	1
	45	2	0	2
	46	2	0	2
	47	1	1	2
	48	1	1	2
	49	5	0	5
	50	1	1	2
	52	2	0	2
	53	2	0	2
	54	3	0	3
	56	0	2	2
	57	1	2	3
	58	3	3	6
	59	4	2	6
	60	0	2	2
	63	0	1	1
	64	0	2	2
	65	1	4	5
	67	0	3	3
	68	1	0	1
	70	1	2	3
	75	0	1	1
	78	0	1	1
	79	0	4	4
	80	1	2	3
	81	1	0	1
	83	0	1	1
	85	0	1	1
	88	0	1	1
	89	0	1	1
	90	0	1	1
	95	0	1	1
	100	0	3	3
Total		46	44	90

Table 4.8 above was used to calculate Chi-Square Tests shown in table 4.9 below

Table 4.9 Chi-Square Tests

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	58.251 ^a	40	.031
Likelihood Ratio	78.983	40	.000
N of Valid Cases	90		
a. 82 cells (100.0%) have expected count less than 5. The minimum expected count is .49.			

(Source Data)

The P value is smaller than the Chi-Square value of 0.031 so we reject H_0 . Therefore PBL has an impact on the learners' performance in the teaching and learning of Personal Hygiene at Form One Combined Science Level.

4.4 Summary

The chapter presented quantitative data in form of tables. Data analysis was done by calculating descriptive statistics such as mean, range, standard deviation and Skewness. PBL has impact on learners' performance as indicated by an increase in mean of experimental group from 48.41 to 69.86 percent. The researcher rejects H_0 because of the Chi square value of 0.031 which was greater than the P value of 0.00. The next chapter will look at summary of findings, recommendations and conclusion.

CHAPTER FIVE SUMMARY, RECOMMENDATION, AND CONCLUSION

5.1 Introduction

Chapter one was an introductory chapter that consists of the background of the study and research objectives. Furthermore it focused on research questions and delimitation of the study. Chapter two explored literature related to the study basing on research objectives. Chapter 3 described and explained the research paradigm, research design, population, sample and sampling procedure. Also the chapter consists of research instruments and ethics. Chapter 4 presented and analysed data. This chapter will provide a recap of all the previous chapters and recommendations.

5.2 Summary of Findings

The first chapter of the study revealed that the education sector is currently faced with a series of changes and reforms and Combined Science as a discipline has not been spared in this revolution. Concepts taught in combined science like Personal Hygiene can be utilised to curb the death of people worldwide from fatal diseases like COVID-19 pandemic, cholera, typhoid, and many others. The great dilemma was to determine the best method to use in teaching the topic Personal Hygiene hence the need to carry out this study to determine the impact of PBL as a teaching method in its infancy stage in developing countries. In order to bring more light to the problem at hand, the researcher tried to achieve the following objectives

To compare the effectiveness of project-based learning approach and the traditional learning

To examine the effects of project-based learning to the teaching and learning of process

Hypothesis testing of H_0 and H_1 shown below was done

H_0 Project-Based Learning has no impact on learners' academic performance.

H_1 Project-Based Learning has impact on learners' academic performance.

During the study the researcher faced challenges such as lack of finance to print questionnaire hence resort to use pre-test and post-test as data collection methods which were less costly. Private policy was the other challenge faced by the researcher and he assured the participants that information will be used for academic purposes only.

Chapter 2 highlighted that defining Project Based learning is problematic as, Hanney and Saving-Baden explain that the term is broad, far reaching and means different things in different countries and disciplinary areas. Project based learning emphasise learning by doing where learners put theory into practice as suggested by Dewey. The learners' role changes from learning by listening to learning by doing,

Project based learning has increasingly been tried and adopted across diversity of educational institutions worldwide. PBL was used long back in developed countries where the internet is often available however challenges of using the method are still faced. On the other hand PBL in developing countries in general and Africa in particular is in its infancy stage and struggle to take roots in the classroom. In Zimbabwe project Based Learning was ushered in by the New Curriculum Framework (2015-2022) currently under implementation.

Several studies were carried out on PBL in science as Al-Balushi and Al-Aamri (2014), Hsu, Van Dyke, Chen & Smith (2015) and Boaler (1998). All the studies showed the PBL improve learners' performance and a number of other benefits are associated with the method. All the studies were carried out in developed countries creating dearth of information in developing countries and Zimbabwe in particular hence the need to carry out this study.

PBL is associated with challenges such as inadequate resources, inflexible schedules and incompatible technology. Also large class size and the pressure to cover all academic content are the other challenges of using PBL as a teaching method.

Chapter 3 dwells on methodology. Quasi experimental research design in form of non-equivalent control group was adopted in the study. The population of the study was 90 Form One learners at the study area. All the learners wrote the pre-test and post-test and attended the lessons. Pre-test and post-test were the data collection method used in the study. On research ethics, the researcher applied for permission to do the study. Also all learners were given opportunity to write pre-test and post-test and to attend lessons. The information was used for academic purpose only. Participants were free to withdraw from the study.

Chapter 4 indicated that PBL improve learners performance as indicated by an increase in mean mark from 48.41 percent to 69.86 percent of the experimental group. Furthermore a smaller P value of 0.000 as compared to the Chi-square of 0.031 indicated that H_0 should be rejected.

5.3 Conclusions

This paper has examined the impacts of PBL in the teaching and learning Personal Hygiene at Form One Combined Science Level. Murereka High School was used as a study area.

The study has found that PBL improves learners' performance as indicated by improvement in mean of post-test mark of 69.86 from 48.41 percent in the pre-test of experimental group.

Furthermore the study revealed that traditional method is not affective method in teaching Personal Hygiene at Form One as evidenced by decrease in mean pass rate to 48.15 from 57.11.

5.4 Recommendations

From the finding and conclusions of the study, the researcher recommends that:

Teachers can effectively use the project-based learning approach if they plan well before teaching and ensure that there is ample time for the learners to actively participate in the classroom with equal chances of experimenting.

Teachers should not dwell on one particular teaching method, but should make use of various teaching methods since one weakness of a certain method can bring in good results and even stimulate the pupils to learn.

Learners should be given a chance to experiment and experience the same conditions that the teacher went through to come up with the answers, explanations to various concepts and questions. This would increase the learners' knowledge, hence boosting the child's interest on the subject.

5.5 Summary of the Chapter

This chapter provided the summary of all other chapters in this research. Main research findings, conclusion and recommendations were highlighted

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Appendix A Pre-Test Form One

Topic: Personal Hygiene

Time 35 minutes

Instructions

Write your name and class with a pencil

Answer all questions

1. State three toiletries and cosmetics used to take care of body parts (6)
2. Define the terms:
 - a) healthy (2)
 - b) hygiene [2]
3. What is a pathogen? Give two examples of pathogens [4]
4. List the importance of doing personal hygiene (2)
5. Outline challenges faced by people in practising personal hygiene (4)
6. Describe ways of taking care of the following body parts:
 - a. Teeth [2]
 - b. Hair [2]
 - c. Hands [2]
 - d. Ears [2]
 - e. Armpits [2]

Total 30 Marks

Appendix B Post Test Form One
Topic: Personal Hygiene

Time 35 minutes

Instructions

Write your name and class with a pencil

Answer all questions

1. State six ways of maintaining good personal hygiene. [6]
2. Give ways of taking care of the following body parts:
 2. Teeth [2]
 3. Hair [2]
 4. Hands [2]
3. List three other body parts that require special attention on personal hygiene. Give a reason for your choice. [6]
4. Define the following terms
 - a. Health [2]
 - b. Personal Hygiene [2]
5. Explain the problems faced by people in practising good personal hygiene. [4]
6. Describe the importance of maintaining personal hygiene. [4]

TOTAL 30 MARKS

Appendix C Daily lesson Plan.

Name of student: Edson Z. Mandizvidza

School: Murereka High

Date: 12 September 2022

Time: 0900 – 1000Hrs (2 lessons)

Class: Form one Orange

No. of learners: 42

Topic: Health and Diseases

Lesson topic: Importance of maintaining personal hygiene and food hygiene.

Lesson objectives: By the end of the lesson, learners should be able to:

- c) State the importance of maintaining personal hygiene.
- d) List ways of maintaining personal hygiene.
- e) Practice good personal hygiene.

Assumed knowledge:

Learners should be able to maintain good personal hygiene from their Primary Education and everyday home life.

Anticipated difficulties:

- f. Lack of knowledge can cause a learner to fail maintain personal hygiene.
- g. Lack of enough time to maintain personal hygiene.
- h. Lack of material resources may cause poor personal hygiene.

Media:

- 5. Apparatus: tooth brushes, scissors, hair brushes, combs, water bowl, matches-sticks, towel, cotton wool.
- 6. Materials: tooth paste, bath soap, perfume, petroleum, lotion, water.
- 7. References: Maganga H., Mapanda A., and Watson D. (2018), *PREMIER Combined Science Form 1 learner's book, page 66*. Oxford University Press, Chavhunduka K. (2017), *Step Ahead Combined Science Form 1 Learner's Book, page 32*. Pearson Education Africa, Cape Town 8001.
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Lesson structure:

Stage	Content	Teacher activities	Learner activities
Introduction (5 minutes)	Importance of maintaining personal hygiene and food hygiene.	The teacher introduces the topic by telling a short story of two people who have different personal hygiene habits, bad and good.	Learners listen and analyze the story together with the teacher.
Step I (10 minutes)	<ul style="list-style-type: none"> i) Stating the importance of personal hygiene. ii) Listing ways of maintaining personal hygiene. 	Teacher leads the class discussion on the importance of personal hygiene. Teacher asks learners to list ways of maintaining hygiene in groups.	Learners brainstorm the points on the importance of maintaining personal hygiene. Learners list ways of maintaining personal hygiene in their groups.
Step II	1. Practicing good personal hygiene.	Teacher asks learners to demonstrate how to hand wash following the procedure shown on the poster.	Learners demonstrate how to hand wash following the procedure shown on the poster.

Lesson closure (5 minutes)	7. Summary on main concepts on maintaining personal hygiene. 8. Checking understanding.	Teacher gives a summary on the importance of maintaining personal hygiene. Teachers ask learners to tell what they have learnt.	Learners ask the teacher on concepts not understood. Learners tell what they learnt throughout the lesson.
Further learner activities (1 minute)	Homework on other good personal hygiene practices.	Teacher give learners the homework on other good personal hygiene practices.	Learners write the homework given in their homework exercise books.

Self-evaluation:

Strengths

The concept on maintaining good personal hygiene was successfully taught. Learners were curious to learn. Learners understood the concept and are now able to state the importance maintaining the personal hygiene. Most are now able to practice personal hygiene by themselves. The media used clearly provides directions on how to maintain personal hygiene.

Weaknesses

The teacher used some apparatus that were sub-standard as to improvise like naturally found sticks from the brushing teeth. Some learners did not like improvised materials. The materials were scarce due to lack of money to buy. Time was limited to gather learning aids and carry out lessons on project-based learning.

Suggestions

The teacher suggests preparations and gathering media in good time.

