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An investigation on the impact of Project-Based Learning (PBL) pedagogy on learners' acquisition of knowledge and skills in the implementation of Heritage Based Curriculum (HBC): A case study of two primary schools in Zimbabwe

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Abstract

This study investigated the impact of the Project-Based Learning (PBL) pedagogy on learners' acquisition of knowledge and skills in Zimbabwean primary schools. The study investigated how the PBL pedagogy fosters critical thinking, creativity, and problem-solving skills among young learners. The study employed a Mixed Methods Approach in which both qualitative and quantitative research designs used, classroom interviews and questionnaires to generate data from 10 teachers, two (2) heads of schools and 20 grade seven learners on the impact of PBL pedagogy, positive outcomes, barriers and pedagogical strategies that enhance the PBL in the implementation of the HBC in primary schools. The major findings were that the impact of PBL pedagogy in HBC on primary school learners was evidenced by their improved academic achievement, promotion of the development of transferable skills such as teamwork, leadership, creativity, innovativeness, entrepreneurship and communication, at a tender age. Positive outcomes of PBL in the implementation of Heritage-Based Curriculum includes increased learner engagement, integration of heritage knowledge systems, holistic assessment, contextual learning and the development of 21st century skills; the barriers revealed were limited resources, time constraints and resistance to change by teachers, and established pedagogical strategies that enhance the use of PBL in the implementation of HBC include community engagement, hands-on learner-centric, integration of technology and interdisciplinary learning. Further, a schematic framework for effective use of the Project-Based Learning pedagogy was developed, anchored on five pedagogical strategies that enhance the implementation of Heritage-Based Curriculum in primary schools.

Keywords: *Heritage-Based Curriculum; pedagogy; implementation; Problem-Based Learning; skills*

1.0 Introduction

The study explores the impact of the Project-Based Learning pedagogy on learners' acquisition of knowledge and skills in enhancing the HBC in Zimbabwean primary schools. Heritage-Based Curriculum refers to an educational approach that embraces community engagement, cultural awareness and appreciation, contextual innovation and values, and the use of locally available resources (DeMink-Carthew and Olofson, 2022). The Zimbabwe Ministry of Primary and Secondary Education (MoPSE) introduced the HBC in both primary and secondary schools in 2024 in order to transform the education system. The HBC aims to integrate Zimbabwe's cultural heritage with the 21st century educational demands focusing on innovation, creativity and practical skills among learners at a tender age.

In modern education transformation, innovation and industrialisation are critical for economic growth and development in a country like Zimbabwe. Thus, it is essential to equip learners in primary schools with the necessary hands-on skills and knowledge for use in the production of goods and services for economic development. Traditional teaching methods like the lecture method, demonstration and experimentation often focus on rote memorisation and passive learning, which may not adequately prepare, and equip learners with knowledge and skills necessary for innovation, industrialisation and entrepreneurship. Project-Based Learning, as a key component of the Heritage Based Curriculum, on the other hand, provides learners with opportunities to develop critical thinking, problem-solving, collaboration, and communication skills, which are essential

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for innovation and industrialisation (Dearing and Cox, 2018). Further, the traditional teacher-centered instructional approaches limit learner opportunities of working together and acquire the skills of communication, collaboration, creativity, and critical thinking.

Furthermore, the Project-Based Learning (PBL) encourages self-directed learning and empowers learners in taking ownership of their education, which is crucial for fostering a culture of innovation.

The complexity of coming up with an effective pedagogical strategy in the implementation of HBC in primary schools ignited this study. It is against this background that this study explores the impact of PBL in the implementation of HBC in selected Zimbabwean primary schools.

1.1 Statement of the Study

Despite the potential benefits of a wide range of traditional teaching methods, the study purposively explored the Project-Based Learning pedagogy in order to establish its impact on learners in the implementation of HBC in Zimbabwean primary schools. The introduction of projects per learning area by Zimbabwe MoPSE in the primary schools is a grey area that requires rigorous study in order to come up with a user-friendly pedagogy. The rigid structure of traditional 3.0 curricula that was anchored on teacher centeredness, research and community service, coupled with limited teacher training, and inadequate resources often pointed to some barriers that hinder effective implementation of PBL in HBC contexts. As a result, learners may miss out on the opportunities to develop essential skills, such as creativity, innovativeness, collaboration which are critical for success in an increasingly complex and interconnected global world. Thus, this study aims to investigate the impact of the PBL pedagogy in the implementation of HBC in Zimbabwean primary schools and emerge with pedagogical strategies and a schematic framework that enhance its implementation.

1.2 Research Questions

The study was guided by the following questions:

1.2.1. What is the impact of Project-Based Learning pedagogy in the HBC implementation in Zimbabwean primary schools?

1.2.2 What are the positive outcomes of using the PBL pedagogy in HBC implementation in Zimbabwean primary schools?

1.2.3 What are the barriers to PBL pedagogy in HBC implementation in the Zimbabwean primary schools' context?

1.2.4 What are the pedagogical strategies that can be used to enhance the Project-Based Learning pedagogy in the implementation of HBC in primary schools?

2.0 Literature review

This section reviews literature related to the effectiveness of Project-Based Learning pedagogy in educational contexts. The focus of the literature includes the scope of Project-Based Learning pedagogy, the essence of HBC, the advantages and disadvantages of PBL pedagogy and the effect of combining PBL pedagogy with HBC in primary schools.

2.1 The scope of Project-Based Learning pedagogy

Project-Based Learning pedagogy refers to a learner-centred approach that involves the art of teaching and learning through real world problems and challenges (Gronroons and Helle, 2020). it is a hands-on methodology that is practically oriented. Bell, (2021), asserts that Project-based learning (PBL) pedagogy has gained popularity in the 21st educational settings as a method, to enhance learner creativity and problem-solving abilities. Thus, this approach involves learners working on real-world projects that require them to apply their knowledge and skills to solve complex problems. Studies by Choi, Shin and Krajcik (2023) established that PBL develops creativity and problem-solving abilities in learners. Further, PBL pedagogy allows learners to actively engage with materials and the community in applying their knowledge in a meaningful context to produce goods and services.

Barron and Darling-Hammond (2021) examined the impact of PBL on learner creativity and found out that learners who participated in PBL projects demonstrated high levels of creativity as compared to those who were not involved in the PBL projects. Thus, engaging learners in open-ended projects that require creative thinking, enables them to develop their creativity and learn to approach problems from multiple perspectives in real life situations. Thomas (2022) asserts that learners who participated in PBL projects were more motivated to learn and showed high levels of engagement in class practical and theoretical individual activities. Thus, PBL assists learners to develop a sense of ownership and autonomy over their learning, leading to increased motivation and interest in the subject matter. This study explores the extent to which Project-Based Learning pedagogy can be used in HBC implementation in Zimbabwean primary schools.

2.2 Advantages of PBL pedagogy

The PBL pedagogy has several advantages over traditional pedagogies as briefly discussed below.

2.2.1 Enhancement of creativity

The PBL method allows learners the freedom to explore different approaches to solve problems, thereby encouraging them to be creative and innovative (Bell, 2021). Thus, the learners learn practically and how to come up with creative ways to solve complex challenges, and also to produce goods creatively.

2.2.2 Improvement of critical thinking

Bronfenbrenner (2020), argues that when learners work on complex projects on their own, they naturally develop critical thinking skills. Thus, PBL pedagogy allows learners to develop critical thinking skills through learning how to analyse problems, identify solutions, come up with informed decisions, and finally producing quality products or services.

2.2.3 Development of problem-solving skills

The PBL pedagogy enables learners to approach complex problems in a systematic, analytic and methodical manner (Spradley, 2019). This process of problem solving enhances the retention of information, knowledge and skills as they

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apply to real-world projects, rather than memorisation of facts for theoretical examination purposes.

2.2.4 Development of soft skills

The PBL pedagogy helps learners develop essential life serving soft skills that include team work, self-time management, day-to-day problem-solving experiences and communication registers (Stojcevski, Xiangyun and Thomas, 2021). Further, the pedagogy naturally prepares learners as the real future workforce by exposing them to real-world challenges and scenarios.

2.2.5 Improved collaboration

Gronroos, (2020), contends that PBL pedagogy promotes teamwork and collaboration. Further, the pedagogy assists learners acquire essential skills for working with other people in a user-friendly environment. The approach encourages learners to work in pairs or in groups of more than three in order to achieve common goals.

2.3 Barriers to the use of Project-Based Learning pedagogy

The PBL pedagogy in HBC implementation has the following barriers:

2.3.1 Time constraints

Limited time is a barrier to Project-Based Learning because the method requires significant time for learners to work on projects per learning area, which can be a challenge considering tight schedules or other curriculum demands (Thomas, 2022). In PBL lessons, learners are expected to identify a problem, come up with a research design and methodology, collect information (data), present and analyse data, and generate solutions, which can take a long time to accomplish. In order to offset this barrier, teachers should be trained in managing time.

2.3.2 Limited local resources

In the context of this study, resources refer to anything that can be used to support PBL development that can be in the form of human, informational, financial and physical materials (Robson, 2018). The resources can be local. Thus, those that can be available within the immediate environment or community. However, resources can be obtained from outside sources. The use of the PBL method in HBC implementation faces challenges due to limited local and external resources as briefly outlined in this sub-section below:

***(a) Shortage of local raw materials* –** The PBL method demands a lot of locally available raw materials. Thus, the limitation of local materials restricts the scope and quality of projects that can be undertaken by learners (Christensen, Horn and Johnson,2020). In the same vein, shortage of high-quality and relevant local raw materials that align to HBC framework becomes a barrier to its implementation.

***(b) Inadequate infrastructure and equipment* –** Bell (2021), asserts that most primary schools in developing countries lack the necessary facilities, technology and equipment to effectively support the implementation of PBL in HBC. Further, lack of appropriate infrastructure hinders the development of creative and innovative skills among learners.

***(c) Inadequate teacher training* –** Teachers are key human resources in the application of PBL method in HBC implementation. Hence, they are expected to be well trained and versed in the methodology (Makate and Makate, 2020). Thus, unknowledgeable and unskilled teachers derail the implementation of PBL. As a whole, teachers need professional development in the pedagogy in order to effectively integrate PBL and HBC principles into their teaching and learning practices.

2.3.3 Challenges of big classes

The Zimbabwean primary school junior classes teacher-learner official ratio is one as to forty (1: 40). In some cases, there are more than forty learners per class. According to Mulhim and Eldokhny (2020), teaching large classes of forty learners or more poses several challenges in PBL, which include the following:

(a) class management – managing a large number of learners maybe difficult, making it a challenge in maintaining class discipline and to ensure that learners stay focused and concentrate on the details of the learning activities;

(b) individual attention – with a high teacher-to-learner ratio of 40 or more to one teacher, it may be challenging to provide attention and support to each learner. Thus, engagement of large classes maybe very difficult, potentially leading to disinterest and disengagement and

(c) assessment and feedback – the teacher may experience difficulties in grading and providing meaningful feedback to a large class of forty or more learners. The process can be time consuming and may lead to delays and unfair practices.

In a nutshell, using the PBL methodology in HBC implementation requires the adoption of strategies that teachers can use to manage large classes, and provide effective teaching and learning for their learners.

2.4 The essence of Heritage Based Curriculum in Zimbabwean primary schools

The HBC in Zimbabwean primary schools aims to improve educational quality by fostering creativity, innovation and problem-solving in learners at a tender age (Sahin and Top, 2019). The key objectives of HBC include the following:

2.4.1 to align education with national goals, in order to foster a sense of identity and prepare learners for participatory citizenship, peace and sustainable development;

2.4.2 to enhance educational quality by improving the learning outcomes, and equip learners with skills to match the rapidly changing technological world: and

2.4.3 to address the demands of a technologically-driven economy that promotes the production of goods and services using locally available resources.

Thus, the essence of HBC in Zimbabwean primary schools represents a significant shift in the whole education system, starting from the primary level, aiming to produce learners

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who are capable of creating solutions and contribute meaningfully to the economic development.

2.5 Features of PBL pedagogy in HBC implementation in primary schools

An integration of PBL in HBC implementation is an innovative approach to the Zimbabwean education curriculum (Dearing and Cox, 2018). The key features of PBL in HBC implementation are highlighted below as articulated in the HBC handbook (2020):

2.5.1 Learning areas – Zimbabwean primary school education focuses on six core learning areas which are Indigenous Language, English Language, Science and Technology, Mathematics, Social Science and Physical Education and Arts. The learning areas embrace key aspects that develop the learners holistically.

2.5.2 School-Based Project (SBP) – The learners are expected to complete one School-Based Project per learning area annually, focusing on hands-on application of skills and knowledge aiming to produce goods and services that benefit the communities.

2.5.3Heritage-Based Curriculum – Integrates cultural heritage with modern educational demands, emphasizing innovation, creativity and practical skills development. It is anchored on using locally available resources in the teaching and learning processes.

In summary, the use of PBL methodology in HBC implementation enhances the development of an understanding of Zimbabwe's heritage and values. It promotes national identity and pride, and fosters critical thinking and problem-solving skills using locally available resources.

3.0 Methodology

This study adopted a Mixed Method Approach (MMA), which involves the combination of numerical and descriptive research methods in data generation. The section specifies the research instruments as well as source of data, population sample and data processing procedures.

3.1 Sample population

The population sample was derived from primary school teachers, heads of schools and grade seven learners. Wuta, (2022) states that a sample is a group of a relatively smaller number of people or objects selected from a population for investigation purposes. The study used purposive and random sampling techniques. Heads of schools were purposively sampled because of their experience and office of special responsibility, while teachers and grade seven learners were randomly selected.

3.2 Sample size

The study purposively chose two (2) heads of schools, and randomly selected ten (10) teachers and twenty (20) grade seven learners from the two primary schools as indicated in Table 1 below.

Table 1: Selected sample size

Category	*Heads of school*	*Primary school teachers*	*Grade seven learners*	*Total*
Number of participants	**2**	**10**	**20**	**32**

3.3 Research Instruments

The study used questionnaires and semi-structured interview questions to generate data.

3.3.1 Semi-structured Interview Schedules

In this study, two (2) heads of schools and ten (10) teachers were interviewed as a focus group in order to gather data on attitudes and perceptions towards PBL pedagogy, barriers to the PBL method in HBC implementation and strategies that effectively enhance the PBL pedagogy in HBC implementation.

3.3.2 Questionnaires

The questionnaires were administered to grade seven learners in an effort to assess their understanding of the impact levels of five selected items on the PBL pedagogy in HBC implementation, using the 5-point Likert scale.

3.4 Data presentation and analysis

Cooper and Schindler (2018) assert that, data analysis an attempt to organize, account for and provide explanations of data so that some meanings are derived from them. The quantitative data generated were presented in the form of statistical tables, while qualitative data were descriptively presented.

4.0 Results

This section focuses on presentation, analysis, discussions and interpretation of both quantitative and qualitative data. The results were presented in themes: which are the impact of Project-Based learning method, benefits of the PBL pedagogy, teachers' perceptions on the PBL method, barriers to the Project-Based Learning method and strategies that enhance the PBL method. The results are presented in table form, descriptively, and numerically.

4.1 The impact of the PBL method in HBC implementation on primary school learners

In terms of the impact of PBL method on learners, in the HBC implementation, the participants were asked about their level of agreement with the statements that describe learner performance. The numeric responses are shown in Table 2.

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Table 2: The level of agreement on the impact of PBL in the implementation of the HBC on primary school learners

Likert-scale		1	2	3	4	5		
Items	**N**	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Mean**	**SD**
Improved academic performance	20	0 (0%)	1 (5%)	1 (5%)	10 (50%)	8 (40%)	3.23	1.1675
Development of transferrable skills	20	0 (0%)	1(5%)	0(0%)	12(60%)	7 (35%)	3.26	1.0566
Development of creative / innovative skills	20	2 (10%)	1 (5%)	1 (5%)	10 (50%)	5(253%)	3.85	1.0925
Develop the skill to produce goods and services	20	0 (0%)	1 (5%)	1 (5%)	14 (70%)	4 (20%)	3.19	1.2383
Development of collaboration and teamwork culture	20	1 (5%)	2 (10%)	0 (0%)	12 (60%)	5 (25%)	3.56	1.2176

Key:
N= Number of sample participants;
Criterion Mean (CM)= 3 and above indicate fairly high level of PBL impact on learners in this study;
Standard Deviation (SD) measures the decision dispersion from the mean score in the study.

Table 2 presents results of responses from learner-participants on five aspects that impacted on their learning on a 5 – point Likert scale. The results are presented below item by item.

4.1.1 Improvement of academic performance

The first item in Table 2 asked participants on whether the PBL method in HBC implementation impacted on learners' academic performance trends. Results indicate that 50% agreed and 40% strongly agreed with the assertion, with a mean score of 3.23 and SD is 1.1675. These results therefore show that 90% of the participants highly agreed with the assertion that the PBL method in HBC implementation was consistent with the support of academic achievement among the learners in the primary schools.

4.1.2 Development of transferrable skills

The second item was on whether the PBL method in HBC implementation anchored on the development of transferrable skills on learners. 60% of the participants agreed and 35% strongly agreed, with a mean score of 3.26 and SD of 1.0566. These results show that on average, 95% of the participants agreed with the assertion that the PBL method in HBC implementation had a significant positive impact on the development of transferrable skills among the learners.

4.1.3 Development of creative and innovative skills

The third aspect was on whether the participants were in agreement that PBL method in HBC implementation develop creative and innovative skills among the learners. The participants who agreed were 50% and those who strongly agreed were 25%, with a mean score of 3.85 and SD of 1.0925. These results show that on average, 75% of the participants agreed that the PBL method in HBC implementation significantly promotes the development of creative and innovative skills among learners.

4.1.4 Develop the skill to produce goods and services

The fourth item required the participants to indicate whether the PBL method in HBC implementation was anchored on learners being able to produce goods and services. Participants who agreed were 70% and those who strongly agreed were 20% with a mean score of 3.19 and SD of 1.2383. These results show that on average, 90% of participants agreed with the assertion, implying that most of the participants felt that the PBL method in HBC implementation assists learners to have the art to produce goods and services.

4.1.5 Development of collaboration and teamwork culture

The fifth item asked the participants on whether the PBL method in HBC implementation develops a culture of collaboration and teamwork. 60% of the participants agreed and 25% strongly agreed with a mean of 3.56 and SD of 1.2176. These results show that on average, 85% of the participants agreed with the assertion that the PBL method in HBC implementation develop a culture of collaboration and teamwork among the learners.

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In a nutshell, the results revealed that the PBL method in HBC implementation was significantly linked to the improvement of academic performance, development of transferrable, creative and innovative skills, capabilities to produce goods and services and the promotion of collaboration and teamwork among the learners.

4.2 Positive outcomes of the PBL pedagogy in the implementation of HBC in primary school learners in Zimbabwe

The qualitative data were synthesised into five major sub-themes based on the participants' responses on the positive outcomes of the PBL method in HBC implementation. The descriptive results are presented below as the sub-section unfolds.

4.2.1 Increased learner engagement

Firstly, the descriptive results indicated that the PBL method in HBC implementation has high opportunities for hands-on activities that significantly increase learner-motivation and engagement. One of the participants had this to say,

***Participant D**: "In my view, through Project-Based Learning method learners are encouraged to engage each other as they work on their projects that demand sharing of ideas, material resources and give each other roles."*

The response implies that the PBL method increases learner engagement with the practical tasks as individuals or as teams.

4.2.2 Integration of heritage knowledge systems

Secondly, the results revealed that the PBL method in HBC implementation allows learners to explore and appreciate Zimbabwe's cultural heritage and values in a practical and project-based manner.

Two of the participants had this to say,

Participant A: "*In my view, the PBL method in HBC implementation allows the integration of heritage knowledge systems into modern education. It encompasses cultural preservation and an understanding of the world, combining traditions and modern perspectives."*

Participant B: *"Based on my experience in incorporating heritage knowledge systems in PBL method, it assists to preserve cultural identity and promotes intergenerational learning."*

The responses imply that the integration of heritage knowledge systems creates a more inclusive and culturally responsive education system that values diversity and promotes sustainable development.

4.2.3 Holistic assessment

Thirdly, the results indicate that the PBL method provides a holistic assessment of learners' knowledge and skills acquisition. Two of the participants had this to say,

Participant D: *"One of the PBL method benefit in education is that it permits assessment to consider various concepts, skills and attributes at one goal."*

Participant F: "*In my view, PBL method, assessment reflects at strengths, and growth providing a more nuanced understanding of learners' abilities."*

The results imply that holistic assessment provides a more complete picture of a learner, minimizing reliance on a single metrics. Further the results suggest that the PBL method allows for authentic, competence-based assessment that measures learner skills and knowledge in a more comprehensive manner.

4.2.4 Contextual learning

Fourthly, the results further reveal that the PBL method has a significant link between concepts and the real-world contexts, facilitating teaching and learning to be more relevant, meaningful and applicable to day-to-day life experiences.

In the same vein, participant B had this to say,

"In my view, PBL method in HBC implementation allows learning to be contextualised and connects the learners' everyday life experiences, the environment and community contexts."

Thus, the results imply that the PBL method uses contextualised learning, giving teachers the opportunity to create learning environments that are relevant, engaging and effective, thereby preparing learners for success in their future endeavors.

4.2.5 Development of 21st century skills

Fifthly, the results also show that the PBL method in HBC implementation naturally enables learners to acquire holistic skills that include creativity, critical thinking and problem solving, which are crucial for success in the 21st century fast-changing world. Two of the participants had this to say,

Participant F: *"It is self-evident that PBL method in HBC implementation develop skills in young learners' critical skills that are crucial in today's fast-changing world of technology. In fact, skills that develop in learners include critical thinking and problem-solving."*

Participant G: "*As a seasoned teacher, I have observed that PBL method in HBC implementation, it fosters the development of creativity and innovation skills which facilitate the production of goods and services."*

The results indicate that the PBL method in HBC method implementation fosters learners' ability to generate new ideas, and produce products or processes that are critical in the 21st century day-to-day life experiences.

In summary, the benefits of the PBL method include the development of critical thinking, problem-solving and collaboration skills; increasing learner-engagement and motivation; and preparing learners for success in the 21st century workforce from a tender age.

4.3 Barriers to the use of the PBL pedagogy in the implementation of HBC in primary schools.

The study revealed barriers to the use of the PBL method in the HBC implementation in primary schools, which are presented in this sub-section as it unfolds.

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4.3.1 Barrier 1: Limited resources

Resources refers to human, material, time and financial that can be used to complete tasks, satisfy needs and achieve goals (Gronroos and Helle, 2020). In the context of this paper, resources include funding, qualified personnel, equipment, facilities, infrastructure and locally available materials.

The results indicate that limited resources is a barrier to the utilisation of the PBL method in HBC implementation. The participants highlighted that barriers to the use of the PBL method included lack of funding, limited specilised teachers, inappropriate infrastructure and limited local materials among others. Three of the participants had this to say,

Participant C: *"There is funding to purchase materials for practical lessons and producing goods."*

Participant E: *"In my view, the infrastructure and equipment we have are not suitable for use during practical lessons. The tools for trade are also limited."*

Participant G: *"In brief, most of us teachers in the primary schools did not go under specilised training in the use of PBL method in HBC implementation. We lack the expertise."*

The study revealed that lack of resources such as funding, materials and specilised personnel hinder the successful use of the PBL method in HBC implementation. The results further imply that limited resources of any category are barriers to the full use of the PBL method.

4.3.2 Barrier 2: Limited time

The results also indicated that limited time was one of the barriers to the effective use of the PBL method in the implementation of HBC.

Two of the participants responded as,

Participant B: *"The timetable is congested with both theory lessons and very little time is allocated for practical lessons and related projects."*

Participant H: *"In my view, time is not adequate for learners to work on their practical. It takes a lot of time to plan, organize and execute a project-based learning practical lesson."*

The responses imply that limited time is a barrier to the effective use of the PBL method for the successful implementation of HBC. Further, the study suggests that learners may be pressured to complete their practical projects in the areas under a limited time frame.

4.3.3 Barrier 3: Resistant to change

The results revealed that generally, traditional teachers resist the use of the PBL method, opting for the traditional methods. Three of the participants narrated the following;

Participant J: *"As I interact with my colleagues, I observed that some of them resist to use the PBL method because of its associated demands like mobilisation of materials and proper selection of tools."*

Participant I: *"I think, parents do not understand the benefits of Project-Based Learning method hence, they even their children to take up their projects seriously. They resist to change."*

Participant A: *"Personally, I am used to the traditional teaching methods and I am not familiar to PBL method. The change might take some considerable time to use the PBL method. That shall be gradual."*

The results above indicate that resistance to change by the implementers is a barrier to the adoption of the PBL method by the implementers. Further, the results imply that both parents, guardians and educators were skeptical about its effectiveness over the traditional methods.

In a nutshell, the results revealed three possible barriers to the use of the PBL method in HBC implementation, which are limited resources, limited time and resistance to change by the implementers.

4.4 Pedagogical strategies that enhance the Project-Based Learning method in the implementation of HBC in primary schools

According to Katiyo (2024), a strategy refers to a long-term plan of action architected in order to achieve specific objectives or set goals. In this study, pedagogical strategy means a critical set of steps that are designed to enhance the use of Project-Based Learning method in the quest to effectively implement the Heritage-Based Curriculum in Zimbabwe primary schools.

The results on pedagogical strategies that enhance the use of the PBL method in the implementation of HBC are descriptively presented as this section unfolds.

4.4.1 Community engagement pedagogical strategy

The results established that the encouragement of learners to engage the local communities, organisations and resource persons helps in addressing real-world challenges, and enhances cultural understanding. Two of the participants highlighted the following;

Participant A: *"My experience taught me that when learners are facilitated to collaborate and engage with the local communities, it promotes cultural understanding and fosters pride and belonging."*

Participant G: *"I think when learners are allowed to engage with the community elders, it naturally allows incorporation of heritage, traditions and cultural themes in their Problem -Based learning."*

The responses imply that community engagement creates friendly social interaction with the community, effective and culturally relevant PBL experiences.

4.4.2 Hands-on learner-centric pedagogical strategy

The results reveal that instituting the hands-on learner-centric pedagogical strategy allows learners to own the responsibility of their learning. One of the participants had this to say;

Participant D: *"Based from teaching experience, when learners are afforded the opportunity to plan and design their research and projects on their own, it allows some space for*

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them to take full responsibility and ownership of their learning."

The results established that projects that are initiated, planned and executed by the learners themselves allow them to take up the responsibility and ownership as they make decisions and develop practical skills. It implies that the PBL method is enhanced by way of letting the learners take full responsibility of diagnosing the problems, make an analysis, plan, carry out the study, carry out the practical activities, and end up with a complete tangible product. Thus, the strategy empowers learners as they develop confidence and sense of responsibility.

4.4.3 Integration of technology in PBL process pedagogical strategy

The results reveal that successful use of PBL in primary schools can be achieved through the integration of technology systems. One of the participants highlighted that;

Participant E: *"In my view, the use of technology may not only engage learners but also prepares them into the world of technology."*

The response indicates that by incorporating technology into PBL activities, learners can develop essential digital literacy skills that are increasingly important in the 21st century. Further, the results imply that technology can be a powerful tool in facilitating Project-Based Learning, as it allows learners to access a wealth of information and resources with peers using virtual platforms.

4.4.4 Interdisciplinary learning pedagogical strategy

The results show that interdisciplinary learning enhances the use of PBL in the implementation of the HBC in primary schools, compared to the teaching of subjects in silos. One of the participants had this to say;

Participant H*: "Interdisciplinary learning could involve elements of science, mathematics, social studies, and language arts in Project-Based Learning method. This enhances the use of PBL method in the implementation of Heritage-Based curriculum"*

The response reveals that, by exploring connections among different subjects, learners are able to see how concepts and skills can be applied to a variety of contexts. This holistic strategy to PBL helps learners develop a deeper understanding of the materials and encourages them to make connections between different areas of knowledge practically.

The overall findings on strategies that enhance the use of the PBL method indicate that by incorporating hands-on, learner-centric approach, community engagement, interdisciplinary project learning and integration of technology promotes successful HBC implementation in primary schools.

5.0 Discussion of findings

The study explored the use of the Project-Based Learning method in HBC implementation in Zimbabwean primary schools. Project-Based Learning (PBL) refers to an instructional method that engages learners in authentic, real-world projects that promote problem-solving, critical thinking and teamwork (Togo and Gandidzwana, 2021). The major findings of the study are discussed as this section unfolds.

5.1 The impact of PBL pedagogy in HBC implementation in primary schools

The study's findings confirm other related studies by Robson (2018); Munzira and Bondai, (2020) and Wuta (2022) who established that the Project-Based Learning method has a significant positive impact on the teaching and learning process at both primary and secondary education levels. Thus, this study emerged with five aspects of the PBL method in the implementation of HBC that positively impacted on learning, which are discussed as the sub-section unfolds below:

5.1.1 Improvement of academic performance and acquisition of skills.

The study revealed that 90% of the participants confirmed that the use of the PBL method in the implementation of the HBC significantly improved the learners' academic performance and acquisition of life skills. It implies that improved academic performance among the learners, motivated them intrinsically and extrinsically. The improvement in skills acquisition also encouraged the learners to produce goods and services that benefitted themselves and the community.

5.1.2 Development of transferrable skills

The study further established that 95% of the participants confirmed that the PBL method in the implementation of HBC develops transferrable skills among learners, that can be applied across different life contexts. The transferrable skills that emerged from the study include communication, collaboration, problem-solving and time management. Thus, these transferrable skills are critical and valuable in that they can be leveraged in various contexts, making the learners more versatile and adaptable to the fast-changing global world.

5.1.3 Development of creative and innovative skills

The study also revealed that 75% of the respondents, indicated that the PBL method in HBC implementation significantly develops creative and innovative skills among the learners. The study further, confirmed that the development of creative and innovative skills among the learners are essential in that they boost confidence, self-expression, the ability to tackle complex problems from unique angles and exploring new ideas in order to produce tangible products.

5.1.4 Development of the skill to produce goods and services

Further, the study established that the use of the PBL method in HBC implementation equips learners with essential knowledge and skills for them to have the potential to produce goods and services, using locally available resources. An average of 90% of the participants indicated that a significant number of learners who were taught using the PBL method in the implementation of HBC acquired skills that enabled them to produce goods and services that include jewelry, software, toys and educational materials using locally available materials.

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5.1.5 Development of the culture of collaboration and team-work

The study also revealed that the use of the PBL method in the implementation of HBC positively develops a culture of collaboration and teamwork amongst the learners. An average of 85% of the participants confirmed that the use of the PBL method in the implementation of the HBC naturally inculcates a culture of collective decision making, collaboration and team-work. Thus, collaboration and teamwork are essential components in achieving shared goals and driving success collectively.

5.2 Positive outcomes of the PBL pedagogy in the implementation of HBC in primary schools

In this study, positive outcomes refer to beneficial results that arise from practical actions, experiences and the application of the PBL method in the implementation of HBC (Katiyo, 2024). The study's findings confirm earlier related studies by Wuta (2022) and Lantada (2022), which indicated that using the PBL method in the teaching and learning processes yields positive outcomes. This study also established positive outcomes of the PBL that emerged from the implementation of the HBC in primary schools as discussed in the following sub-sections:

5.2.1 Increased learner engagement: **-** The results showed that the use of the PBL method in the implementation of the HBC, has high potential in increasing learner motivation and engagement because the learners are directly involved in hands-on activities as teams. The findings resonate with Wuta (2022) who asserts that the PBL method advocates for interactive learning and real world-application of skills in teams. Thus, it implies that the use of the PBL method in the implementation of the HBC in primary schools creates more learner-engagement and an effective user-friendly learning environment for producing goods and services at a tender age.

5.2.2 Integration of heritage knowledge systems: **-** Further, the study established that the use of the PBL method in the implementation of the HBC, ignites the learners' curiosity to explore Zimbabwe's heritage and appreciate its integration with Information, Communication and Technology Education. The study also confirms that the integration of heritage knowledge systems in the HBC promotes a culture of appreciation and the valuing of locally produced goods and services.

5.2.3 Holistic assessment: **-** It also emerged from the study that the application of the PBL method in the implementation of HBC in primary schools, provides and promotes wholesome assessment procedures. The findings are in tandem with Coelho and Reis (2023) who asserts that holistic assessment allows comprehensive evaluation of learner academic learning, practical skills acquisition, level of product processing and beneficiation. In fact, the method also supports inclusivity and equity during learner assessment.

5.2.4 Contextual learning: **-** Further, the study established that the use of the PBL method in the implementation of HBC in schools, contextualises learning scenarios. It also emerged that the physical learning environments and availability of local resources dictate the context in which learning space should take place. It implies that contextual learning has the potential to link academic concepts and rea-life situations that create environments in which learners can acquire hands-on skills, as well as better comprehension and retention of information for solving life threatening challenges.

5.2.5 Development of 21st century skills: **-** The findings confirmed that the application of the PBL method in HBC implementation, has high potential for the development of the 21st century skills among the learners. The 21st century skills include creativity, innovation, critical thinking, entrepreneurship, problem-solving, technological communication as well as the production of goods and services.

5.3 Barriers to effective use of the PBL pedagogy in HBC implementation in Zimbabwean primary schools

The study's findings resonate well with the study by Lantada (2020) and Benito-Osorio and Colio (2018), who argue that barriers that hinder effectiveness of the PBL method basically include lack of teacher preparedness, financial limitations and choice of projects that need long timeframes to complete. In the same vein, this study emerged with three barriers that hinder effective use of the PBL method in the implementation of the HBC in primary schools, which are discussed as this sub-section unfolds.

(a) Limited resources: **-**The study established that limited resources such as lack of qualified teachers, funding and the shortage of raw materials can significantly hinder the successful use of the PBL method in the implementation of the HBC in schools. Thus, it implies that lack of trained teachers who can apply the PBL method may result in learners failing to receive the depth of knowledge and skills needed to produce goods and services. Further, limited funding hinders the procurement of tools of the trade, such as current text books, computers, equipment and raw materials for hands-on learning experiences.

(b) Limited time: **-** According to Muzira and Bondai (2020), with the HBC rollout in schools in Zimbabwe, learners are expected to work on and complete School Based Projects (SBPs) that emphasise practical application and hands-on learning in addition to the existing academic, hence overloading the timetable. This study established that limited time on the school timetable prevents learners from coming up with quality projects as they end up doing their work hurriedly or copy others' work without ethical considerations. It also emerged that limited time constrains the effective use of the PBL method in the implementation of the HBC in primary schools.

(c) Resistant to change by some stakeholders: **-** The findings revealed that selected education stakeholders go through experiences of fear of the unknown; hence they opt for the traditional methods which are not compatible with the implementation of the HBC in primary schools. The study also showed that selected teachers and guardians were uncertain about the outcomes of using the PBL method in the

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implementation of the HBC due to its associated demands such as raw material mobilisation and the purchase of appropriate tools of the trade. Thus, it implies that direct and indirect resistance to change by some key stakeholders in education, hinders the progressive application of the PBL method in the successful implementation of the HBC in primary schools.

5.4 Pedagogical strategies that enhance the PBL method in HBC implementation in primary schools

A pedagogical strategy is a plan of action that is tailor-made to achieve a particular goal or set of goals (Katiyo, 2024). It emerged from this study that strategies such as community engagement, hands-on learner centric, integration of technology in the PBL process and interdisciplinary learning enhance the use of the PBL method in the implementation of the HBC in primary schools. These findings are in agreement with the assertion by Togo and Gandidzwana (2021), that tailored strategies enhance the effectiveness of the PBL method. The four emerging strategies are briefly discussed as this sub-section unfolds.

5.4.1 Community engagement strategy: - It refers to a process of working collaboratively with people affiliated to each other by their geographic proximity and special interest (Muzira and Bondai,2020). It emerged from the findings that learner engagement of the communities in their learning and practical projects promotes the addressing of challenges associated with the PBL method collectively. Further, it creates friendly social interaction that enhances effective use of the PBL method in the HBC implementation in schools.

5.4.2 Hands-on learner-centric strategy: - It is an approach that engages learners in meaningful and authentic activities that have real-world relevance, making learning more interesting and relatable (Wuta, 2022). The findings established that the hands-on learner-centric strategy enhances the PBL method as this approach encompasses a wholesome of features which include ownership of their projects as well as development of teamwork and communication skills. In a nutshell, the strategy encourages learners to reflect on their learning and project processes in line with HBC implementation.

5.4.3 Integration of technology in PBL process strategy: - The findings are in agreement with, Lantana, (2020), who asserts that the integration of technology in teaching and learning enhances learner engagement and facilitates collaboration with platforms such as Google work space, multimedia tools and digital portfolios among other technology tools used for PBL. The study also established that by integrating the use of technology during the PBL process enhances creativity, real-world preparation, online research, use of Artificial Intelligence (AI) and blended learning, which are key to the development of the 21st century skills.

5.4.4 Intradisciplinary learning strategy: - The study findings concur with Wang, Jabri, and Efros (2019), who also established interdisciplinary learning as an approach that combines a multiple of academic and practical disciplines to foster a deeper comprehension of complex concepts and to promote creativity, critical thinking and problem solving. It implies that the strategy creates relevant, more engaging and effective learning contexts that prepare learners and make them ready to encounter complex and rea-world challenges.

6.0 Conclusions

Based on the findings of the study the following were conclusions made on the impact of PBL pedagogy in the implementation of the HBC in Zimbabwean primary schools:

5.3.1 firstly, it had significant impact on learner academic performance, acquisition of transferrable skills, development of creative and innovative skills, ability to produce goods and services and building a culture of collaborative and teamwork at a tender age;

5.3.2 secondly, it had positive outcomes that include increased learner engagement, integration of heritage knowledge systems, institution of holistic assessment, promotion of contextual learning and the development of 21st century skills among the learners;

5.3.3 thirdly, the barriers to its effective use, include limited resources such as trained personnel, funding, raw materials and tools of trade and time as well as resistance to change by some selected key stakeholder. Thus, limitation of these resources hinders the progressive implementation of the HBC through the use of PBL processes; and

5.3.4 fourthly, strategies that enhance the effectiveness of using the PBL method include community engagement, hands-on learner centric, integration of technology and interdisciplinary learning.

Guided and informed by the study's findings and insights drawn from the conclusions, a ***Schematic Framework*** for the enhancement of the Project-Based Learning method in the implementation of the Heritage Based Curriculum was developed as illustrated on ***Figure 1*** below:

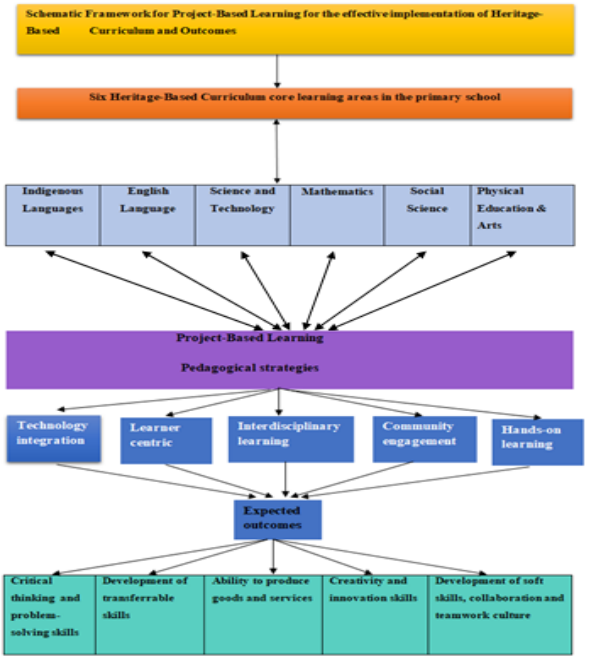

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Figure 1: Schematic Framework for PBL for the effective implementation of Heritage-Based Curriculum and outcomes

References

1. Cooper, D. R., and Schindler, P. S. (2018). *Business research methods*. (12th Ed.). McGraw-Hill Education.
2. Bell, S. (2021), *Project-based learning for the 21st century: Skills for the future*. *The Clearing House*: A Journal of Educational Strategies, Issues and Ideas, 83(2), 39–43.
3. Benito-Osorio, D., and Colino, A. (2018). *Web 5.0: the future of emotional competences in higher education*. Global Business Perspectives, 1, 274-287.
4. Bronfenbrenner, U. (2020). *The Ecology of Human Development: Experiments by Nature and Design.* Harvard University Press.
5. Choi, K., Lee, H., Shin, N., Kim, S. W., & Krajcik, J. (2023). *Re-conceptualization of scientificliteracy in South Korea for the 21st century*. Journal of research in science teaching, 48(6).
6. Christensen, C. M., Horn, M. B., & Johnson, C. W. (2020). *Disrupting class: How disruptive innovation will change the way the world learns.* McGraw-Hill.
7. Coelho, L., & Reis, S. S. (2023). *Enhancing Learning Experiences Through Artificial Intelligence: Classroom 5.0. In Fostering Pedagogy Through Micro and Adaptive Learning in Higher Education: Trends, Tools, and Applications (pp. 169-191).* IGI Global.
8. Cooper, D. R., and Schindler. S., (2014). *The impact of Continuous Assessment Learning Activity nexus industrial development in the context of Zimbabwean Education System 5.0*. Journal of Economics Education & Entrepreneurship, 3(1), 37-48.
9. Dearing, E., & Cox, M. J. (2018). *Innovation in education: Learning from global experience.* Cambridge University Press.
10. DeMink-Carthew, J., & Olofson, M. W. (2022). *Hands-joined learning as a framework for Personalizing project-based learning in a middle grades classroom: An exploratory study.*
11. In Dialogues in Middle Level Education Research Volume 1 (pp. 106-133). Routledge
12. Gronroos, C., & Helle, P. (2020). *Adopting a service logic in manufacturing: Conceptual, Foundation and metrics for mutual value creation.* Journal of service management, 21(5).
13. Katiyo, A. (2024). *Exploring the Implementation of Heritage-Based Education 5.0 Curriculum in Tertiary Institutions, in Zimbabwe*. International Journal of research in Academic World. E-ISSN:2583-1625, pp167-178
14. Lantada, A. D. (2022). *Engineering education 5.0: Strategies for a successful transformative project-based learning.* Insights Into Global Engineering Education After the Birth of Industry 5.0, 19.
15. Lantada, A. D. (2020). *Engineering education 5.0: Continuously evolving engineering education*. International journal of engineering education, 36(6), 1814-1832.
16. Makate, C., & Makate, M. (2020). *Parental involvement and academic performance in Zimbabwe: Perceptions of secondary school teachers.* Journal of Sociology, Psychology, and Anthropology in Practice, 8(1), 39-52.
17. Robson, C. (2018). *Real World Research: A Resource for Users of Social Research Methods in Applied Settings*. John Wiley & Sons.
18. Muzira, D. R., & Bondai, B. M. (2020). *Perception of educators towards the adoption of education 5.0: A case of a state university in Zimbabwe.* East African Journal of education and social sciences, 1(2), 43-53.
19. Barron and Darling-Hammond (2021). *Teachers' reflections on impact of PBL on students on the stage (SOS) model.* In A Practice-based teaching Model (pp. 205-224). Brill publishers.
20. Stojcevski, Xiangyun, & Tomas (2021), *Educational Innovation and Change for Project Based Learning.* McGraw-Hill
21. Thomas, B. (2022). *Educational Innovation and Change for PBL.* Brill publishers
22. Togo, M., & Gandidzwana, C. P. (2021*). The role of Education 5.0 in accelerating the implementation of SDGs and challenges encountered at the University of Zimbabwe.* International journal of sustainability in higher education, 22(7), 1520-1535.
23. Wang, X., Jabri, A., & Efros, A. A. (2019). *Learning correspondence from the cycle-consistency of time.* In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 2566-2576).
24. Wuta, R. K. (2022). *Extendibility of the Education 5.0 Concept to Zimbabwe" s Secondary School System as Encapsulated in Curriculum Framework 2015-2022*. Indiana Journal of Humanities and Social Sciences, 3(5), 26-33.

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