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Teachers' understanding and enhancement of learning for sustainability in Mauritian primary schools.

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Abstract

The purpose of the current action research study within a case study design was to explore teachers' understanding and enhancement of Learning for Sustainability (LFS) in the Mauritian primary education context using a participant-designed action research. Theoretically, the study drew from Burns Model of Sustainability Pedagogy and O'Donoghue's Active Learning Framework. LFS might be simply understood as a concept that describes all educational activities concerned with developing an understanding of the related concepts in sustainability. Teachers find it difficult to bridge their understanding and practice through enhancement in their teaching. This study helped to address such a shortfall in schools and to address the purpose, methods including observations and reflections to generate data from six participants were used. Data generated was analysed using thematic analysis where data was categorized and interpreted in terms of common themes which were synthesized and generalised to provide an overall portrait of the case constructed. The findings indicated that there was different understanding of LFS among primary school teachers and that their understanding greatly influenced their enhancement in their teaching. The study further found that enhancement of LFS improved teachers' practices and experiences by bringing new knowledge in their understanding of LFS. We recommend that this study allows other teachers, school leaders, policy makers and curriculum writers to develop proper understanding of LFS and address the lack of data and provide insights for future teachers' enhancement by bringing positive change and adaptation strategies in teacher learning and understanding practices.

Keywords: Learning for Sustainability, Primary, Schools Teachers.

1.0 Introduction

The National Curriculum Framework (NCF) of the Ministry of Education and Human Resources (MoEHR, 2016) identified Learning for Sustainability (LFS) as an essential teaching strategy that must be adopted to achieve a successful basic quality education. In 2010, the MoEHR in Mauritius advocated LFS across all subjects as the framework for curriculum design to be taught at all stages in primary and secondary institutions. UNESCO claimed that climate change and sustainability issues are lacking in school curricula in more than half of its member countries (UNESCO, 2021). Teachers need to ensure that these critical and developmental outcomes are promoted as far as possible at school (NCF). It has been reported that early education has a very positive effect on a country's development when its society is concerned (Painuly, Tyagi, Vishwakarma, Khare & Haghighi, 2020). The statements from UNESCO and the NCF are urging teachers to develop and drive learners towards achieving a more sustainable future. According to our observation and that of many fellow colleagues, teachers rarely prepare learners towards a sustainable future when they themselves are uncertain about what this means and requires. The new curriculum requires that teachers be no longer mere implementers, but rather implementers and designers of curriculum which has a priority place (Hill, Emery & Dyment, 2020).

Through this study, the concern was laid on the future generation and their ability to deal with the real and adverse consequences of decades of environmentally, socially, and economically 'unconscious' decisions made earlier by their predecessors. As stated by Allen (2021) and Gajparia, Strachan, Vare and Ferguson (2021), ignorance and inaction manifested by an education of packaged programs, a focus on examination and centralized curriculum are not preparing the future generation to be critical decision makers in terms of stewardship of our society, economy, and environment. There is a need to move from basic understanding of individual components of our biotic and abiotic environment to a transformed way of thinking and doing things in a sustainable manner (Casinader, 2021; Filho, Pallant, Enete, Richter & Brandli, 2018; Moyer & Sinclair, 2020). One of the main purposes of education is to create informed, conscious citizens who possess a sense of responsibility. This sense of responsibility is not limited to a concern for the environment, but also to issues of equity, citizenship, social justice, and compassion.

2.0 Preview of Literature

LFS is the process of developing the knowledge, skills, values and attitudes and the critical agent needed to move from where we are now to a state of sustainability (Mughal, Qaisrani, Solangi & Faiz, 2011; Taylor, Quinn & Eames, 2015; Laurie, Nonoyama-Tarumi, Mc Keown

& Hopkins, 2016). LFS includes a balance between nature and the environment. There is a synergy that exists between the natural or physical environment and the social and human environment but according to Hlalele (2019) there has always been at least in the realm of scientific discourse, an attempt to dissociate between the natural and the social/human environment. Hlalale's statement is in consistency with Dyball and Newell (2014) who also states that there is tension with human ecology between those who favour an open-ended approach and those who seek a more scientific way of proceeding. The Millenium Development Goals emphasize that integrating environmental and social dimensions into the pursuit of economic development aims (UNESCO, 2012; Taylor et al., 2015) acknowledging that our future economic health critically depends on our planet's ecological health (Almond, Grooten & Peterson, 2020). LFS is more than a knowledge base related to environment, economy, and society. It addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods, participate in a democratic society and live in a sustainable manner.

Even though, schools in so many countries are expected to teach for sustainability, pre- and in-service teachers' lack of confidence and preparedness to conceptualize and practice sustainability is identified as one of the key barriers to its implementation (Green & Somerville, 2015; Dash & Mohan, 2017). According to a regional workshop in Johannesburg, South Africa, in collaboration with UNESCO, the main challenge of working with sustainability in terms of implementation into the national school system in Mauritius is the different and comparative understanding of LFS for teachers as a concept and as a philosophy/principle for the new education system (UNESCO-Regional office for Southern Africa-ROSA, 2018). According to Taylor et al. (2015) and Ben-Eliyahu (2021), people around the world recognize that current economic development trends are not sustainable, and that public awareness, education and training are keys to moving society towards sustainability. With the launch of the United Nation Sustainable Development Group in 2015, countries and stakeholders are encouraged to support a vision for a sustainable future based on removal of poverty and the establishment of social cohesion and peace. Global learning and sustainability are now as unavoidable in education, especially in primary education, as learners now are tomorrow's adults. In Mauritian schools the learning about global and sustainability issues within the curriculum is stated in the NCF. According to Kuzmina, Trimingham and Bhamra (2020), who argue that policies and approaches that emphasize whole-school LFS engagement are scarce. Nkambwe and Essilfie (2012) and Tsayang and Kabita (2013) elaborate and show that there is still a limited understanding of what LFS means both in conceptual and practical terms for teachers and teacher trainers in Botswana. Many teachers are keen to implement LFS in primary schools but

are lacking the confidence, skills, and knowledge to do so (Green & Somerville, 2015; Adawiah & Esa, 2012; Dash & Mohan, 2017). Teachers report that they do not understand the concept and cannot integrate LFS into an already overcrowded and centralized curriculum (Green & Somerville, 2014; Suarez-Lopez & Eugenio-Gozalbo, 2021). Teachers are usually more concerned with completion of the syllabus, at the expense of the overall development of the learners, because of the exam-oriented system of education in Mauritius. Some teachers are reluctant to implement new activities and projects at schools. Moreover, there is a lack of mechanism in the education system to ensure and regulate the teaching and learning of sustainability-related contents (Allen, 2021).

It is claimed in recent literature that there is lack of empirical and in-depth research investigating pedagogical practices for teaching sustainability in higher education (Michel, 2020). According to sustainability scholars and researchers, there is lack of research regarding sustainability issues on what teachers' understanding of LFS are and how they are enhanced in Mauritian primary schools and abroad. There is an urge to prepare school children for life. An awareness of teachers' understanding and enhancement of LFS might help them to align their teaching strategies to the learners' characteristics which might lead to achievement of specific learning outcomes and better performance. This study explores how teachers understand and how their understanding shapes their enhancement of LFS in their daily classes and sheds more lights to the actual situation prevailing in our primary schools which can eventually contribute to improve the dissemination of sustainability knowledge to our learners for them to become ambassadors for sustainability. Hence, in one-way school teachers can be empowered to develop appropriate behavioural changes and acquire sustainability competencies that will enable them with sustainability challenges that current society is facing (Lasen, Skamp & Simoncini, 2017; Burgener & Barth, 2018). As stated by Adawiah and Esa (2012), in so doing, primary school teachers together with their learners can also become ambassadors for sustainability for the future (Green & Somerville, 2015; Murphy, Mallon, Smith, Kelly, Pitsia, & Martinez Sainz, 2021).

3.0 Theoretical Framework

The theoretical perspectives and lenses that informed this study include Burns Model of Sustainability Pedagogy (Burns, 2013) and O'Donoghue's Active Learning Framework (O'Donoghue's, 2001).

3.1 Burns Model of Sustainability Pedagogy

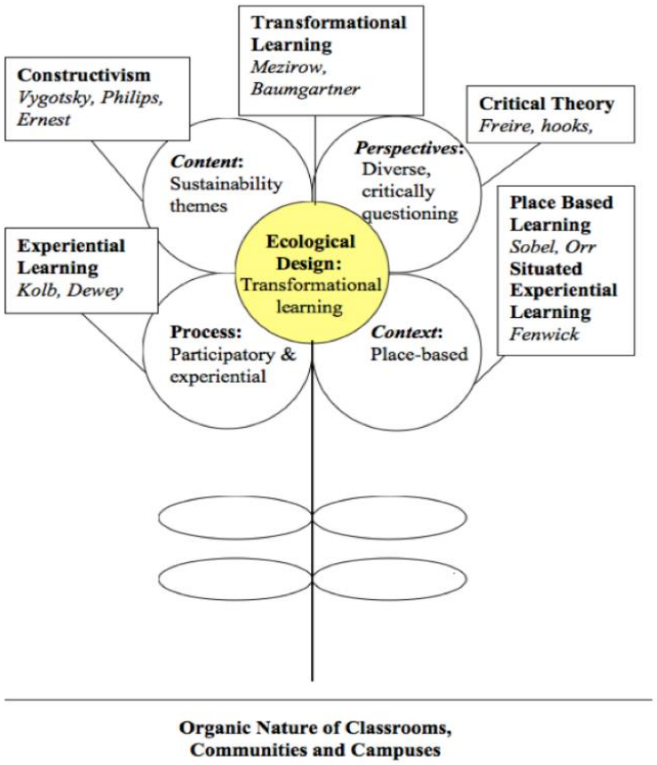

Figure 1. The Burns Model of Sustainability Pedagogy

Burns Model of Sustainability Pedagogy (Burns, 2013) was developed to address the need for a practical way to effectively teach LFS in several contexts (Burns, 2009, 2011, 2013). It addresses the growing need to focus on how teaching and learning can be re-oriented towards sustainability and more specifically how teachers can effectively address and tract increasingly well-known sociocultural, economical, and ecological problems in ways that metamorphose learners and empower them to make change based on a sense of civic responsibility and sustainability (Burns, 2013). Teachers generally agree that teaching LFS is to encourage change agents who are responsible to cater for sustainability challenges (Redman, 2013). As ecological and social crises accelerate, the need for sustainability education that prepares learners to understand complex issues and to participate in social and ecological regeneration is evident and paramount (Gamage, Ekanayake & Dehideniya, 2022).

3.2 O'Donoghue's Active Learning Framework

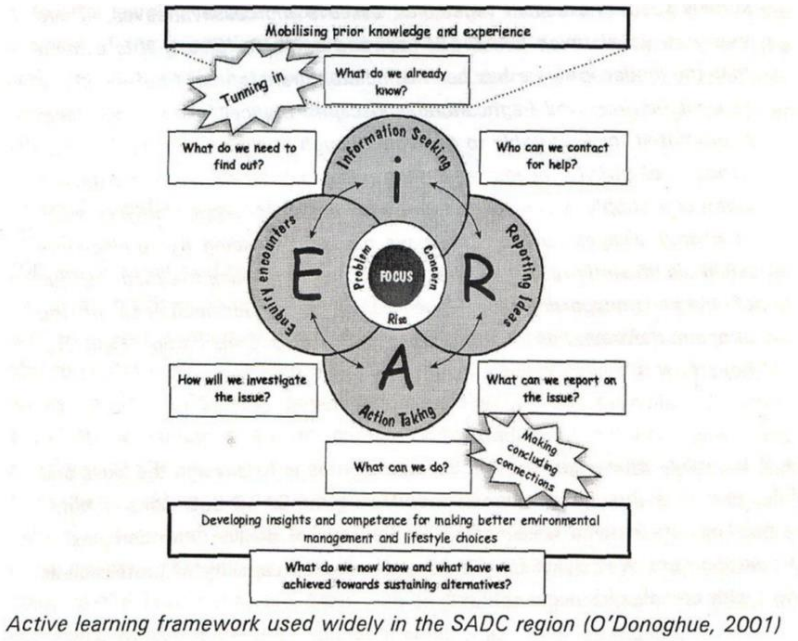

Figure 2. O'Donoghue's Active Learning Framework

Teachers implementing LFS are inspired to provide opportunities whereby learners are involved in genuine decision-making that impacts on their local communities (UNESCO, 2005). Taylor, Quinn, Jenkins, Miller-Brown, Rizk, Prodromou, Serow and Taylor (2019) draw on the growing phenomenon of not being able to translate the understanding of LFS into practice. What is lacking in literature discourses is an explanation as to how teachers, especially within Mauritian context, develop the knowledge and skills to engaging with the complex issues of LFS. The way suggested in O'Donoghue's (2001) Active Learning Framework is an explanation of how teachers can engage learners in independent learning. The model provides an action plan for learning about and responding to environmental issues (O'Donoghue et al., 2018). It advocates those learners be engaged in action taking activities within the community to develop their attitudes and skills towards the better interests of LFS.

4.0 Research Methodology

Action research was the main driver of this study as it offered an opportunity for reflective practice with regards to teachers' understanding and enhancement of LFS. Greenwood and Levin (2007) define action research simply as research that is conducted by at least one expert with individuals in an organisation or common field, to bring about a transformation of the context in which the individuals exist or work whilst Altrichter, Kemmis, McTaggart and Zuber-Skerritt (2021) define action research as an activity that mainly aims to develop process skills and achieve emancipation. The transformation leads to a better and more functional

environment in which the individuals live or work (Greenwood & Levin, 2007; Hendricks, 2019; Kemmis, McTaggart & Nixon, 2019; McNiff, Edvardsen, Steinholt & Margit, 2018).

The action research cycle used in this study was adapted from Kurt Lewin's (1946) and Coghlan and Brannick's (2003) model of action research methodology which begins by exploring a concept or idea. This was achieved via the step of '**planning**' whereby the teachers recognised what they knew about the concept, idea, or context to be investigated and involved designing a plan that resulted in a desired outcome. The second step of '**action**' involved acting the plan that was previously set. The third step of '**observation**' involved observing how teachers develop their understanding of LFS and how they enhanced them in their teachings. Finally, '**reflection**' on the action taken resulted in a new cycle which emerged in which re-planning took place to improve the action. Hence, this cycle involved four steps of **planning-action-observation-reflection** (Coghlan & Brannick, 2003). **Figure 3** is an adapted version of Kurt Lewin's (1946) and Coghlan and Brannick's (2003) model of action research which was adopted for this research.

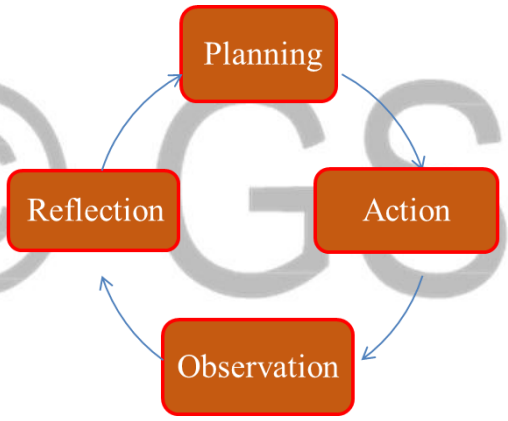

Figure 3. Action Research Cycle -Adapted from Lewin (1946) and Coghlan and Brannick (2003)

5.0 Selection of participants

Convenience sampling also termed as judgement sampling (Bhardwaj, 2019; Lune & Berg, 2017) for qualitative research was adopted in this study (Wang & Cheng, 2020). As Cohen, Manion and Morrison (2018) succinctly suggest, the prime purpose of a qualitative study is to observe tiny representatives "nested in their context" and study these in depth. As Mauritius is a small island where schools are easily accessible, we wanted to discover, understand, and gain insights and therefore it was easily accessible for us to select our participants from which the most could be learnt (Lune & Berg, 2017). Here, since we already knew something about the specific people or events (Guetterman, 2015), we deliberately selected six participants who were general-purpose teachers for this research.

6.0 Data Generation

After selecting names of the teachers, a request was made, through contact by phone and personal meetings, inviting them to take part in the study. Different methods, techniques and instruments were used in a targeted fashion within the action research cycle. In **Table 1** a summary of the data generation methods and instruments are provided to illustrate how they were used in this study.

Table 1. Data Generation Methods and Instruments used

Cycle steps	Methods	Instruments	Objectives
Planning steps	Semi-structured interview	Interview schedule	Explore teachers' understandings and enhancement of LFS.
	Document analysis	Lesson plans	Identify LFS contents and concepts for their lesson implementation.
Action & Observation steps	Classroom observation	Observation schedule & reflective journals	Conscious reflections on teachers' understanding of LFS and how they shape their enhancement.
Reflection steps	Post-lesson meeting and conversation	Questioning	Explore teachers' understanding and how they shape their enhancement through new knowledge construction.
	Document analysis	Reflective journals	Existing and new understanding of LFS on why they enhance LFS the way they do.
	Post-intervention final interview	Interview schedule	New knowledge of understanding and enhancement of LFS through their reflections.

7.0 Data Analysis

According to Tjora (2018), data analysis involves dismantling, segmenting, and reassembling data to form meaningful findings to draw inferences. The process of data analysis enables the researchers to make sense of the data that are generated (Tjora, 2018; Xu, & Zammit, 2020). A constant **comparison analysis** was used to analyse the conversations after transcription to see what themes needed further exploration. According to Dufour and Richard (2019) and Lindsay (2019), this strategy involves taking the statements from the interviews, classifying them, and comparing them with other interviews. **Thematic analysis** was adopted to identify the 'recurring messages that pervaded the situation' (Xu & Zammit, 2020). Data from the interviews, observations, document analysis and reflective journals were used to respond to the research objectives. The data obtained through individual interviews were indexed using pre-defined themes and new themes added as required. The themes were then grouped into common, salient, and significant themes and that could shed light to the research objectives (Yin, 2018; Akinyode & Khan, 2018).

8.0 Findings, Interpretation and Discussion

8.1 The Themes and Sub-Themes: Cycle One

The following section describes and reveals the main findings of the data generation. The responses are expressed in the form of words and sentences to the questions posed during the interview, document analysis, meetings, and class observations, and are grouped according to the themes that were produced (**Table 2**). Furthermore, it also identified areas of deficit in teachers' enhancement of LFS that could be addressed in the next cycle. The themes and sub-themes that emerged from the data were:

Table 2: Thematic analysis of data- Cycle One

Thematic Analysis- Cycle One			
Data generation	**Coding (Sub-themes)**	**Theme**	**Implication for next cycle**
• Semi-structured interview • Document analysis	Teachers' perceived knowledge of LFS Teachers' attending to LFS in the curriculum Classroom activities relating to LFS	Theme One: Understanding of LFS	What are teachers understanding of LFS and how they use them to shape their enhancement

• Classroom observation • Pre and Post lesson meetings • Reflective journals	Participation in LFS		
	Surface Approach to Learning Teacher-Centered Learning Didactic Learning Traditional/Conventional Learning	Theme Two: Limited Approaches to LFS	How are the approaches to learning affect teachers understanding and enhancement of LFS?
	Situational/Institutional Barriers Educational System Management Support Inadequate Teacher Training	Theme Three: Constraining Factors Affecting LFS	How are these constraining factors impeding teachers' enhancement of LFS?
	Initial Teacher preparation of LFS Teaching of LFS Teacher Engagement and Enhancement of LFS	Theme Four: Teachers' Perception and Engagement towards LFS	How are teachers' enhancement shaped?

8.1.1 Theme One: Understanding of LFS

According to Green and Somerville (2015) many teachers are keen to implement sustainability education in primary schools, but they lack the appropriate knowledge and skills to do so. During data generation, it was observed that teachers did not have great knowledge of LFS and as a result, they could not address LFS successfully in their lessons. Moreover, their classroom activities were passive where pupils could not grasp great knowledge of LFS. It was also concluded that teachers' participation in their enhancement of LFS was very limited during cycle one. They themselves declared in their post cycle one interview that they needed to update their knowledge on LFS. Hence, these factors limited the teacher to embed sustainability education more explicitly in their classrooms, just as pointed out by Dyment and Hill (2015). As such, this explicates for our unsustainable actions and for that of our learners. Not having

the right knowledge of LFS from teachers, the learners are prone to perform unsustainable actions continuously aiding in the degradation of society and the environment.

8.1.2 Theme Two: Limited Approaches to LFS.

Data which was generated through classroom observations during the cycle one helped us to know about the different strategies and approaches that teachers used to conduct their first lesson. Not having great knowledge of LFS and teaching strategies, most of them used traditional and surface approaches to learning which contradicted themselves on what they reported during their semi-structed interviews. Theme two dealt about the teachers' limited approaches to learning in the classrooms. Most of the teachers used surface approach to a great extent where the concepts of LFS was not addressed sufficiently. In so doing, the utmost priority was not given to LFS which was argued that it required innovative, place based, active learning strategies as supported by the Burns Model of Sustainability Pedagogy and the O'Donoghue's Active Learning Framework. The classes were not interactive sufficiently for the children to grasp the essence of concepts of LFS and implement them in their daily lives to about the estimated change to sustainable living for the future. Seatter and Ceulemans (2017) proposed transformative learning for the pupils to be able to understand LFS effectively and to put it into practice. But, in contrast, the traditional way of teaching used by the participants was not convenient for the 21st century pupils who get bored much easily.

8.1.3 Theme Three: Constraining Factors affecting LFS

Implementing an educational change is a complex process and it is crucial to understand the factors affecting LFS to be able to find ways to address it. Miedijensky and Abramovich (2019) enumerate various factors affecting LFS stating that these must be addressed for the efficient implementation of LFS in schools. The findings in this theme indicated that there were many factors that constraint the proper enhancement of LFS in primary schools. Firstly, there were situational/institutional barriers that hinders the teaching of LFS. This was evidenced by the barriers caused by parents, teachers, and the school in the proper teaching of LFS. Also, participants stated some other barriers such as the education system, lack of management support and inadequate teacher training on LFS in primary schools. It was also found that the above barriers were key factors which hindered appropriate change in behaviours towards sustainability living and futures. Pompeii, Chiu, Neil, Braun, Fiegel, Oulton, Ragsdale, and Singh (2019) propose that all these barriers should be overcome so that effective LFS can be conducted in schools where learners would be able to grasp the knowledge and be ready for the required change.

8.1.4 Theme Four: Teachers' Perception and Engagement towards LFS

Teachers' perceptions on the importance of teaching LFS play a major role on their attitudes towards LFS (Maidou, Plakitsi & Polatoglou, 2019). Gaining an insight of the perspectives and engagement of the teachers on LFS can be very useful in this study. The interview questions were based on how the teachers perceived teaching and their engagement towards LFS. It consisted of data obtained on initial teacher preparation, their teaching of LFS and teacher engagement and enhancement of their understanding of LFS. It was found that the experienced teachers could engage themselves and enhance their understanding of LFS in their teachings to some extent. Contrarily, novice teachers, lacking teaching experience, were not aware of LFS could hardly engage fully in LFS. Basically, if a teacher is not engaged in teaching, it is very bad for the pupils. Also, if the teacher thinks that the latter knows everything and that the way the latter taught in the previous years still works, he is mistaken. As life keeps on evolving, a teacher should be a lifelong learner and should keep on changing the ways of teaching to meet the demands of the 21st century learners. Pompeii et al. (2019) too suggested that teachers should identify their shortcomings and overcome them accordingly. Once teachers have positive perceptions of the LFS, they would start engaging themselves willingly towards LFS.

8.2 The Themes and Sub-Themes: Cycle Two

At the end of cycle two all the six teachers were again interviewed individually. The basis of the interview was two folds, firstly getting a view on their experiences and challenges they faced during the action research study, and secondly how their understanding shaped their enhancement of LFS in the way they did. **Table 3** provides the following themes and sub-themes that emerged from the data during Cycle Two of the action research cycle.

Table 3. Thematic analysis of data- Cycle Two

Thematic Analysis- Cycle Two			
Data generation	**Coding (Sub-themes)**	**Theme**	**Outcome after Cycle Two**
• Semi-structured interview	Teachers' perceived knowledge of LFS. Teachers' attending to LFS in the Curriculum.	Theme Five: Understanding LFS.	How Teachers' constructed their understanding of LFS?

• Document analysis • Classroom observation • Pre and Post lesson meetings • Reflective journals	Classroom activities in LFS. Participation in LFS.		
	Deep Approach to Learning Holistic Learning Approach Experiential Learning Problem-based Learning Action/Transformational Learning	Theme Six: Innovative Approaches to LFS	How do teachers brought about change to shape their understanding of LFS in their lessons?
	Situational/Institutional Assistance and Support Enhanced Educational System Need for Management Support Mainstreaming LFS in Teacher Training	Theme Seven: Strategies to address LFS	What are the ways teachers shaped their enhancement of LFS?
	Initial Teacher preparation of LFS Teaching of LFS Teacher Engagement and Enhancement of LFS	Theme Eight: Teachers' Perception and Engagement towards LFS	Why do teachers shaped their enhancement the way they do?

8.2.1 Theme Five: Understanding LFS

In the previous cycle, the findings revealed that teachers had limited understanding of LFS as some never came across the term and some did not pay great attention to LFS before that. As teachers' understanding of the concepts of sustainability influences their way of handling and enhancement in the classroom (Svenkerud, Madsen, Ballangrud, Strande & Stenshorne, 2020), teachers needed to upgrade their knowledge of LFS to be able to make pupils take decisions to the best of the future, based on their knowledge acquired. In cycle two, teachers made some inquiries and explored ways to teach LFS, gained some content knowledge of the concepts and conducted another class to demonstrate their new understanding and enhancement of LFS. Just

as Watson (2017) argued in his study, learners should be taught using active learning strategies and for this teacher's understanding of LFS is very crucial. Teachers' engagement and participation in class play a significant role in the education of the learners (Grove, 2019) and this could happen when the teachers have appropriate and accurate understanding of LFS. As there was no appropriate training given to teachers on LFS, it became difficult for them to integrate sustainability in their lessons. Having accurate content knowledge would make teachers confident in their teaching and then no one can challenge them in imparting the knowledge. Svenkerud et al. (2020) affirm that LFS is not a new phenomenon, but it is new thoughts that all teachers are supposed to implement in their daily teachings. Hence, teachers could upgrade their knowledge by themselves, or training sessions could be provided to the teachers to strengthen their knowledge on LFS so that in other schools too teachers could help in achieving the goals of sustainability.

8.2.2 Theme Six: Innovative Approaches to LFS

Pahnke, O'Donnell & Bascope (2019) recommended teachers to promote inquiry based learning and scientific thinking in pupils and favour interactive teaching that enables exploratory, action oriented, reflective, and transformative learning to teach sustainability. Literature found it the best way to inculcate LFS in the pupils. Teachers were able to find that experts proposed a change in their teaching strategies to be able to address LFS in their classrooms. Consequently, they made use of those innovative approaches in their lessons which were very fruitful according to them. It has been observed there was distinctive enhancement in the teachers' approaches to learning. They had sufficient content knowledge of LFS and were able to express themselves more clearly on their understanding of LFS and there was a considerable upgrading in the teachers' lessons which were interactive and where pupils were excited to participate in the teaching and learning. As argued by Seatter and Ceulemans (2017) LFS cannot be taught using the current traditional teaching. The latter stressed that transformative and innovative activities should be designed by the teachers to be able to make difference in the behaviour of the pupils in this 21st century. Natkin (2016) too confirmed that LFS should be taught using a variety of teaching practices and assessment strategies. Teachers must take pupils out of the classrooms and let them see the beauty of the nature (Watson 2017). Learning actively, they should be able to discover by themselves and develop skills necessary to achieve and maintain sustainability in future. And these innovative strategies should be taught to the teachers through training and briefing sessions.

8.2.3 Theme Seven: Enablers for LFS

The enablers are the factors that aid in the sustained implementation of evidenced-based practices in LFS and can assist school teachers and administrators in identifying strategies to use when planning for implementation of LFS. Theme seven elaborated on the different enablers of LFS mentioned by the participants in the semi structured interviews and their reflective journals. They proposed some strategies and experienced them during their action research to address LFS in primary schools. Knowing about the barriers and looking for some ways to address them could assist in the proper implementation of LFS in classes and the school. The participants proposed some enablers of LFS which could be used and modified accordingly at schools for the effective teaching and learning of LFS. Teachers should use new modes of teaching like innovative learning styles and transformational learning. Also, the education system should be enhanced together with situational and institutional support to enable the smooth running of LFS in schools. Addressing the barriers can result in better understanding in teachers and learners. Watson (2017) finds it crucial to use innovative strategies to be able to create in a change in the learners on LFS.

8.2.4 Theme Eight: Teachers' Perception and Engagement towards LFS

This theme elaborated on the teachers' new perceptions and enhancement towards LFS in cycle two. The findings showed considerable change in the teachers' perspectives and the engagement towards LFS. They demonstrated significant improvement in the way they conducted their lessons and how they enhanced their understanding of LFS to be able to meet the needs of our sustainable future. Having a better knowledge and understanding of LFS contents, the teachers were better equipped to conduct their classes which were interactive and where teaching and learning took place efficiently. It was perceived that the teachers were able to learn and upgrade their knowledge and understanding of LFS. Through research work and help from peers, they used innovative strategies in their lessons to inculcate the values and skills necessary for change towards LFS in the pupils. The teachers were more than convinced finding their outcomes from their second cycle experience that they had an improved and upgraded understanding of LFS and they had enhanced them in their teachings. This led to a remarkable transformation of their lessons which benefited their pupils. As argued by Bholah (2017), through experiential and problem-based learning, learners were able to experience and reflect on scenarios and deduce by themselves how to start changing their attitudes towards LFS. Teachers needed to change their perceptions so that they could engage themselves in LFS. Maidou et al. (2019) concluded in their research that teachers who lack content knowledge and ways to teach LFS, needed appropriate professional development training which could upgrade

their ability to teach their learners. They believed that teachers could influence learners to help solve sustainability issues.

9.0 Discussion and Conclusion

9.1 Teachers' Engagement in the Action Research Cycle.

The data generation process indicated that teachers were not able to prompt their pupils to develop as critical thinkers and were more vested towards traditional approaches for teaching and learning styles. From the observation it was clear that during the first cycle, pupils adopted a traditional learning approach as defined by Tularam and Machisella (2018) which was conducive to sitting and listening. This is corroborated with Giraldo-Garcia, Roy & Alotebi (2015) where they say that traditional teaching approach does not develop pupils as critical thinkers. Moreover, teachers were not able to incorporate new knowledge from outside the curriculum into their teachings, thus relying exclusively on the prescribed textbook as a mean to deliver the limited content knowledge. The above was also true for a participant who declared that she never had to search for additional content knowledge regarding science topics and LFS from outside what was already prescribed in the textbooks. This situation in class created a lethargy where pupils were not motivated to actively participate in class discussions and participation resulting in poor to nil for new knowledge development in the field of LFS. As a result, pupils also showed disengagement in their learning process but could not be generalised for subjects other than LFS.

9.2 Action Research as a driving force to support change

During this action research study, the participants were able to develop their knowledge construction of their understanding of LFS within their lessons. They were also able to use reflective practice from their understanding to enhance LFS during the action research cycles. Furthermore, teachers were able to drive this understanding of LFS through their content knowledge and experiences from their teaching practice. Teachers showed more confidence during their second action research cycle as they reflected positively to new methodologies and strategies to conduct their lessons. Finally, the participants were all certain about their enhancement of LFS where they addressed LFS adequately in their second action research cycle. They all expressed their feeling of rightly implementing LFS during the action research study and were motivated fully to investigate problematic situations regarding LFS in primary schools. All the participants were favourable to implement LFS in their future education

situations in schools while teaching as part of their new experience through the action research study where they fully enhanced LFS. The above statement stands true as a driving force for change for the betterment of one and all in their career path. However, change can only be brought when teachers are willing to implementing new innovations, policies and adaptation strategies in teacher learning and understanding practices. As informed in the NCF and the findings, there are enablers which addresses LFS which includes the syllables, content, textbooks, and SDGs components but a lack of capacity building can eventually pose a serious drawback for teachers to address confidently the concepts of LFS in primary schools.

9.3 Reflection on Teachers' Enhancement of LFS

It was no doubt that all the participants had developed their knowledge based on LFS and thus contributed towards the knowledge around teachers' understanding and their enhancement of LFS. By no means, those teachers who participated in the action research study were sole contributors to new knowledge construction in the field of LFS in primary schools but however they had marked the first milestone towards becoming exemplary in LFS. The reflective journal had no doubt offered an important tool for teachers to critically analyse the events and construct their knowledge of LFS throughout the action research study. It also provided important features on how and when to react to situation which prompted them to change or amend their teaching techniques and strategies. There was no doubt that teachers who engaged in writing reflections, spend more time in planning and action for their lessons and thus engaging fully in reflective practice. Through reflection and pre and post lesson meetings a corelation was built between the participants and the flow of the action research study especially during the intervention phases that encouraged them to change their thoughts and understandings to conceptualise LFS in their teachings. Teachers were more confident as they showed considerable change in aspects of rapport in the classroom and in their interactions with their pupils as regards to their enhancement of LFS during their lessons.

9.4 A LFS model for promoting change towards Sustainability

The lens through which we aimed to address the challenge of exploring teacher's understanding and enhancement of LFS in primary schools was that we regarded both Burn's Model of Sustainability Pedagogy and the O'Donoghue's Active Learning Framework as closely related to our aspirations for our phenomenon under observation. In fact, the various phases and the steps during the action research study had proved that integrating both theories contributed to address the research objectives which brought about the change expected to transform teachers and pupils to address effectively the increasing socio-cultural, economic, and environmental

problems in our society. In one hand, Burn's Model provided the necessary pedagogy that were incorporated in class activities which focussed on how teaching and learning was happening and how it was re-oriented towards sustainability as witnessed during the different phases. On the other hand, O'Donoghue's Active Learning Framework provided incentives for teachers to engage themselves towards action taking to develop necessary attitudes, skills, and knowledge for understanding LFS. O'Donoghue's Model also acted as a guide on what needed to be done to address and understand LFS through active learning teaching and learning. Developing from both models, we have come to a refined model of LFS adapted to the learning situations in schools after the six teachers constructed their understanding of LFS and enhanced them into their teachings during the action research study. The model provides incentives to develop proper understanding of LFS and addresses the lack of positive insights for the teacher's enhancement by bringing positive change and adaptation strategies in teacher learning and understanding practices during their enhancement. Through the journey with the six participants, we established the following model (**Figure 4**) which explains the processes that exists between the aspects of LFS, as well as its understanding and enhancement and the context in which it is being implemented.

According to our model of LFS, classroom interactions which represent a classroom context/location/subject or topic dealing with sustainability issues are built up through the impregnation of prior content knowledge and experiences of sustainability with appropriate teaching methodologies and approaches. Further to the classroom interactions, the focus is driven towards active and transformational learning. The focus is driven by the interaction between environmental concern, socio-cultural concern, and economical concern in between themselves and towards the focal point in the triangular structure. The focus thus drives the LFS through the action taking process which enables the development of insights and competences through teaching and learning activities. This model is adapted to bring about necessary positive change and strategies in teaching and learning practices. It should be viewed as an inevitable transdisciplinary and trans-perspectival since it is not meant to capture by a single discipline or by any single perspective. LFS model that emerged from this action research study should be considered as cross-boundary in nature that cannot be confined to the dominant structures and spaces that have shaped education systems for centuries now. As such LFS cannot be limited to only classrooms and schools. Learning in the context of sustainability requires 'hybridity' and synergy between multiple actors in society and the blurring of formal, non-formal and informal education.

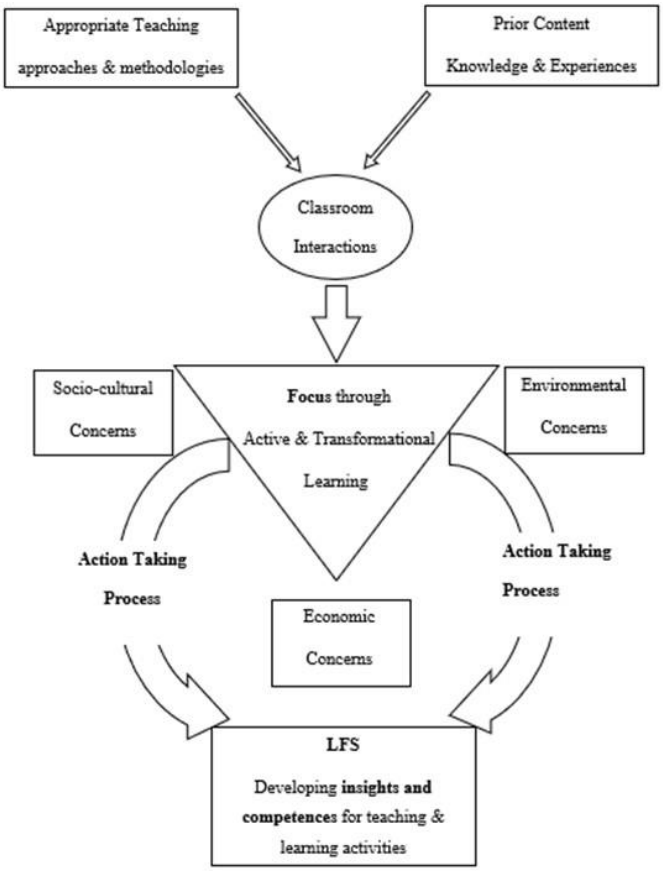

Figure 4: A model of the LFS

10.0 Recommendations for Further Research

We strongly recommend that further research may be undertaken considering more than two cycles approach in a similar study. This would no matter add more and greater insights and perspectives for the teachers, policy makers, curriculum writers and authorities who embark upon the LFS initiatives to develop proper understanding of LFS. We would also recommend that this type of research must also complement with research on the broader school community taking on board such as school management, parents, NGOs, civil society, and the local and central authorities. Findings born from such research would contribute greatly the present discourse that informs understanding of what is required to ensure proper address of LFS in the education systems in Mauritius and abroad.

11.0 Conclusion

This study was an attempt at exploring teachers' understanding and enhancement of LFS. It aimed to present the main findings of the participant-designed action research study regarding the research questions. The findings reported that teachers mainly view LFS as educating about the environmental aspect rather than considering its socio-cultural and economic aspects and

their inter-relationship. An elaborated understanding of the inter-relationship between the three aspects of sustainability was sadly lacking. Findings confirmed that there was a different and comparable understanding of LFS among primary school teachers and that their understanding greatly influenced their enhancement in their teaching practice. The study further found that enhancement of LFS improved teachers' practices and experiences by bringing new knowledge in their understanding of LFS. We did have enablers like the NCF which really addresses LFS but a lack of capacity building and mainstreaming of LFS were observed. Teachers by the end of the study showed gargantuan motivation through their understanding and enhancement for further implementation of LFS indicating that the action research process was an empowering one. LFS needed to be considered as more than merely a knowledge base. It must be viewed as inevitably transdisciplinary and even trans-perspectival in that it cannot be captured by a single discipline or by any single perspective. LFS must be considered as cross-boundary in nature that cannot be confined to the dominant structures and spaces that have shaped education for centuries now. LFS cannot be limited to only classrooms and schools. Learning in the context of sustainability requires hybridity and synergy between multiple actors in society and the blurring of formal, non-formal, and informal education

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