

Disaster Education: A critical analysis of the integration of Disaster Risk Reduction in Primary School Curriculum in Botswana

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Declaration

I declare that: "Disaster Education: A critical analysis of the integration of Disaster Risk Reduction in Primary School Curriculum in Botswana" is my own work, that all sources used or quoted have been indicated and acknowledged by means of complete references, and that this dissertation was not previously submitted by me or any other person for degree purposes at this or any other university.

Signature: _____

Date: _____

KEY WORDS: Disaster Education; Curriculum Integration; Disaster; Disaster Risk Reduction;

Abstract

Globally, countries have been faced with severe disasters that affect mainly children because their vulnerabilities are not addressed through DRR policies and practices. These disasters also affect their education in many ways that include disruption of the school calendar, damage to school infrastructure and inaccessible roads. Importance of integrating DRR into school curriculums include, helping children in identifying and responding to risks that are found in their community which will reduce their vulnerability and building resilience, deaths will be reduced as children will be better prepared regarding what to do in a disaster, and students can act as information disseminators to the whole community.

This study aimed at investigating the extent of DRR integration into the Botswana primary school curriculum. To investigate this, the research objectives guided the direction of the research and research questions were formulated and aligned to each of the research objectives. The mixed method approach was used which was a combination of qualitative and quantitative approach as well as four data collection tools, namely secondary data collection, structured and semi-structured questionnaires and observation. To help answer the questions, the four types of primary schools in Botswana were used, these being PYP schools, Government Schools, English Medium Schools and Cambridge Schools. Staff from the Curriculum Development Unit and Disaster Management Office were also took part.

The study highlighted the global policies that featured DRR education and two such policy were the now lapsed HFA, through its Priority for Action 3, Core indicator 2 resolved to use knowledge, innovation and education to build a culture of safety and resilience at all levels of society by integrating DRR into the curriculum, and its successor, the Sendai Framework for DRR 2015-2030. Botswana also came up with the

National Disaster Risk Reduction Strategy 2013-2018 which promotes the awareness of DRR at schools and communities known to be at risk.

The study also revealed that in integrating DRR into the curriculum vertical integration across the curriculum, where DRR themes and topics could be infused into different subjects could be most ideal for Botswana. The research found out that activities through experiential learning theory were the most suitable for DRR curriculum integration process. EL was found to link what students learn in class with what they do at home and in the community.

Botswana is a country that has a fair share of disasters but children in Botswana are given very little knowledge, skills and tools to prepare effectively for the disasters. The study revealed that children in Botswana remain vulnerable to hazards because the government has not given to the in-depth integration of DRR in the primary school in Botswana. Though the educators appreciated the importance of integrating DRR into the curriculum, they also highlighted the challenges that they encounter in this endeavour. The major challenges being, educators lack of knowledge and skills and an already bloated curriculum, should DRR education be introduced as a subject. Solutions to these challenges were also suggested as training/workshops for teachers in DRR education teaching and resource allocation.

The study concluded with some recommendation which largely emanated from respondents suggestions. These included that, Government should commit to DRR curriculum integration and teacher training to support the teaching of DRR education, DRR education and EL should be formalised into subsequence policy documents as well as in teacher-training, and use of infusion through vertical integration in DRR integration into the primary school as it is a familiar approach to Botswana education.

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Acronyms and Abbreviations

AU	African Union
BNDMP	Botswana National Disaster Management Plan
DMO	Disaster Management Office
DRC	Democratic Republic of Congo
DR	Disaster Risk
DRR	Disaster Risk Reduction
EL	Experiential Learning
HDI	Human Development Index
HFA	Hyogo Framework of Action
IDNDR	International Decade for Natural Disaster Reduction
ISDR	International Strategy for Disaster Reduction
MI	Multiple Intelligence
MDGs	Millennium Development Goals
NDMO	National Disaster Management Office
NDRMP	National Disaster Risk Management Plan
NGO	Non-Governmental Organisation
PYP	Primary Year Programme
SFDRR	Sendai Framework for Disaster Risk Reduction
UNDP	United Nations Development
UNISDR	United Nations International Strategy for Disaster Risk

CHAPTER 1 ORIENTATION AND PROBLEM STATEMENT

1.0 INTRODUCTION

In recent history, there has been an increase in the frequency and severity of disasters which pose a threat to lives and sustainable development efforts (Mitchell et al, 2009: 6). When disasters occur, children are the most affected and school attendance is usually disrupted (UNISDR, 2006-2007). It is estimated that 175 million children will be affected by disasters every year for the next decade (UNICEF, 2011:1). Pakistan and India, in 2005, witnessed the collapse of 6700 schools (Campbell & Yates, 2006:6) killing 17000 children due to an earthquake. In the Philippines, between 200 - 250 school children and their teachers were buried alive in a mudslide that covered their school (Babuguru, 2012:436; Campbell & Yates, 2006:6). Such major humanitarian issues dilute the achievements made by the now lapsed second goal of the Millennium Development Goals (MDGs), which seeks to achieve universal access to primary education (UNCRD, 2009).

Children are heavily affected by disasters and form a high proportion of deaths in disasters, because their vulnerabilities are not prioritised in the Disaster Risk Reduction policies and practices (Babuguru, 2012:436; Wisner, 2006:6). Children's rights, lives and needs are threatened with disasters (Sharpe, 2008:55). Their unique developmental, psychological and physiological attributes make them particularly vulnerable in coping with and surviving during a disaster (King, 2013:19). Disasters also affect the children's future developmental potential. Children do require different forms of physical, mental, social, and emotional support than do adults (Peek, 2008:23). After disasters, families may lose their livelihoods which may make children drop out of school. This then may result in girls going into early marriages and being trapped in a cycle of poverty (Fordham, 2012:424). It can then be argued that a lot of effort should be made in addressing children's vulnerabilities. One avenue for addressing children's vulnerabilities could lie in improving education on disaster risk.

Education plays an important role in reducing people's vulnerability, and in enhancing their resilience to extreme events as it enables one to be prepared and to contribute fruitfully to society (Luna, 2012:750). This notion supported Priority for Action 3, Core Indicator 2 of the lapsed Hyogo Framework for Action (2005-2015) which resolved to use knowledge, innovation and education to build a culture of safety and resilience at all levels of society. The Hyogo framework has been succeeded by the Sendai Framework, Priority for Action 1, Indicator 24 (I) (Kagawa & Selby, 2014:11) which seeks to "promote the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and informal education, as well as in civic education at all levels, as well as in professional education and training". This is supported by UNESCO (2011:3) which argued that "making disaster risk reduction part of the national primary and secondary school curricula fosters awareness and a better understanding of the immediate environment in which children and their families live and work".

Several cases of children using the knowledge they acquired from school to save lives during disasters have been highlighted. In December 2004 during the tsunami that struck a beach in Thailand, a British school girl, Tilly Smith, used the knowledge that she acquired during a geography lesson to recognize the signs of Tsunami and saved lives (Campbell & Yates, 2006:4; UNISDR, 2006:1; Randall & Burger, 2005:1). Approximately 3000 children from Kamaish Junior School escaped to safety during the Great East Japan earthquake of March 2011 by making use of what they learnt during their routine disaster education (Japan Journal, 2012:1). Children play an important role in the preparation of disasters (Evans & Oehler-Stinnett, 2006:34) as the education of a child has the potential to influence others in the home through sharing of information from school (King, 2013:23).

The above examples show the advantages of integrating disaster risk reduction in the school curriculum. Selby and Kagawa (2012:4) supports this notion by arguing that, "Education can be instrumental in building knowledge, skills, and attitude necessary to prepare for and cope with disasters as well as in helping learners and the community return to normal life". This is also supported by Wisner (2006:4) who believes that

education, knowledge and awareness are critical to building the ability to reduce losses from natural events when they do inevitably occur. It can then be argued that it is important for countries to integrate disaster risk reduction into the Primary School curriculum in order to reduce the children's vulnerability to disasters and Botswana (which is the focus of this study) is no exception.

1.1 DEFINITION OF TERMS

Some of the terms that will be focused on in this study are defined below.

Disaster is a result from the combination of hazard, vulnerability and inefficient capacity or measure to reduce the potential chance of risk (Kapoor, 2012:2). UNISDR (2009:10) argues that "Disasters are often a combination of the exposure to a hazard, the conditions of vulnerability that are present and insufficient capacity or measures to reduce or cope with the potential negative consequences."

Disaster Risk Reduction is defined by UNISDR (2011:7) as, "the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disaster, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment and improved preparedness for adverse effects." Kapoor (2012:174) defines disaster risk reduction as, "the conceptual framework of elements considered with the possibility to minimize vulnerability and disaster risks throughout a society to avoid or limit the adverse impacts of hazards within the broad context of sustainable development."

Curriculum is a structured plan outlining the modules and assessments opportunities that underlie the educational goals and objectives. In simple terms, curriculum has been defined as a means of achieving specific educational goals and objectives (Shao –Wen Su, 2012:154; Beauchamp, 1977:22)

Infusion is an approach whereby themes and topics are carried in existing subjects (Selby & Kagawa, 2014:61)

Vertical Integration is when learning outcomes through the academic grades/ standards are structured such that the student is enabled to handle more complex material as they mature (Selby & Kagawa, 2014:61; Brunner, 1960:13)

1.2 THE STUDY CONTEXT

Botswana is a country that has a fair share of disasters. The disasters that affect Botswana are both human induced and natural. Major disasters in Botswana include, “drought, HIV/AIDS, animal diseases such as foot and mouth, malaria, road accidents and wild land fires” NDMO (2013:10). Malaria risk is high (up to 80%) in areas along the Zambia/Zimbabwe border including Chobe, Ngamiland and Okavango districts (Chihanga et al, 2013:8). In 2013, floods destroyed crops and swept away livestock, this affected 842 families which represented 4210 persons (IFRC, 2013). Since 1981 Botswana has experienced recurrent drought (NDMO, 1996:4). In response to this the government, through its department of disaster management, has introduced a number of activities that include early warning systems and response to drought. (NDMO, 1996:27).

Regardless of these challenges, Botswana children are given very little knowledge, skills and tools to prepare effectively for these disasters. The curriculum does cover the themes and topics related to disasters, including road safety, HIV/AIDS, STIs, water borne diseases, first aid, and livestock diseases (Collegium, 2005:1). However, the delivery of these lessons lack emphasis on information on how to better prepare for disasters and to respond if any of the disasters were to occur in their community.

1.3 PROBLEM STATEMENT

As such, the problem under investigation is that Botswana government has not prioritised DRR in schools which puts vulnerable children at even greater risk. It is then against this background that this study will examine the integration of DRR in the primary education curriculum in the country.

This research will be guided by the research questions outlined below. Each question is aligned to an objective that will be employed to answer a specific question.

1.4 RESEARCH QUESTIONS

This research will endeavour to answer the following questions:

1. Has Botswana integrated DRR into the curriculum?
2. How does the experiential learning approach help to enhance children's understanding of DRR education?
3. Are Botswana DRR policies and strategies aligned to international DRR policies and strategies on the inclusion of DRR in the school curriculum?
4. How can integration of DRR be improved in Botswana primary school curriculum in Botswana?

1.5 RESEARCH OBJECTIVES

The objectives below will guide the direction of the research:

1. To explore whether Botswana has integrated DRR in primary school curriculum.
2. To discuss how experiential learning approach may enhance children's understanding of DRR education.
3. To explore how Botswana DRR policies and strategies are aligned to international DRR policies and strategies on the inclusion of DRR in the school curriculum.
4. To examine ways of improving the integration of DRR in the Botswana Primary School curriculum.

1.6 CENTRAL THEORETICAL STATEMENTS

The theories of learning that can be used to build children's capacity in DRR include behaviourist theories, cognitive psychology, constructivism, experiential learning and

situated learning theories (Simpson & Jackson, 2003:25; Ord, 2012:56). For the purposes of this research, the theory of experiential learning will be used. Kolb (1984:38) defines experiential learning as “a process whereby knowledge is created through transformation of experience”. It is a philosophy and methodology in which educators purposefully engage with students in direct experience and focused reflection, in order to increase knowledge, develop skills, and clarify values (Armstrong and Fukami, 2008:33). Experiential learning is also known as learning by doing, and is based on three assumptions (Ord, 2012:55) which are listed below:

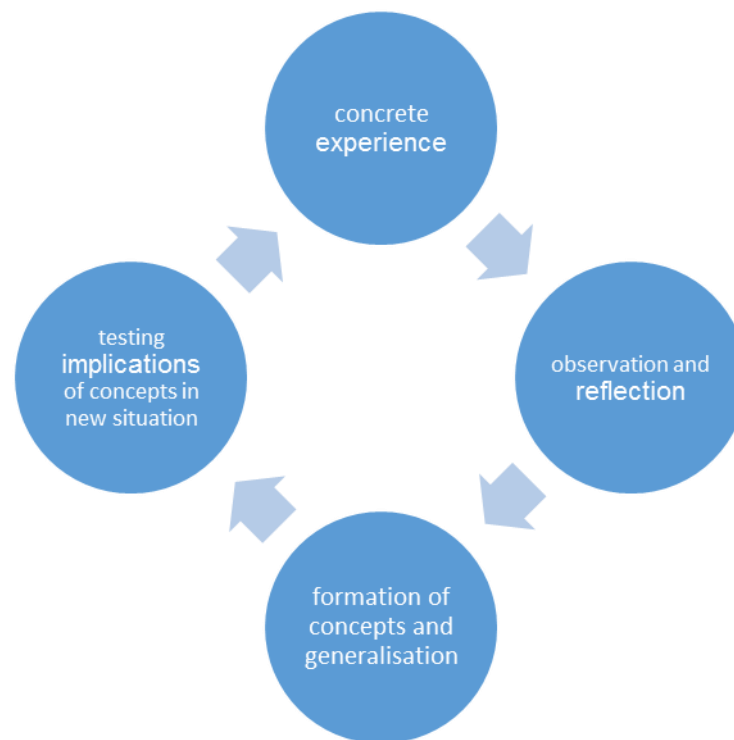
1. People learn best when they are personally involved in the learning experience
2. Knowledge has to be discovered by the individual if it is to have any significant meaning to them or make a difference in their behaviour.
3. A person's commitment to learning is highest when they are free to set their own learning objectives and are able to actively pursue them within given frameworks.

This goes on to authenticate the well-known maxim penned by Dewey (1938:56) which says, “There is an intimate and necessary relation between the process of actual experience and education”.

It can then be argued that experiential learning theory is best suited for this research as it uses experiences of the children in their everyday lives, thereby building children's capacity in DRR (Concern, 2011:14). It helps develop the whole child who can realistically assess his/her level of risk (Yee Ng et al., 2009:519) and promotes a more participatory learner-centred approach emphasising direct engagement, rich learning events, and the construction of meaning by learners (Sharpe, 2008:54). The knowledge gained then changes the children's behaviour (Yee Ng et al., 2009:513). Experiential learning touches on experience, reflecting, thinking and acting in a recursive process that is responsive to the learning situation and what is being learnt (Armstrong and Fukami, 2008:41)

An explanation of Lewin's experiential learning model in (Dewey 1938) as cited in Ord (2012:56), will be briefly discussed below.

Figure 1: Lewin's experiential learning model cited in Ord (2012:56)



The model is a four stage cycle of learning (Sharpe, 2008:26) whose elements help in the development of the DRR integrated curriculum as knowledge is created through the transformation of experience (Kolb, 1984:39).

Concrete Experience: Concrete experience focuses on tangible elements of the immediate environment. It can then be argued that, when a child grasps an experience, he/she has to use that experience to manage unforeseeable events, the experience become useless if the child does not do anything about it.

Reflective Observation: The tangible events then become the basis for reflective observation (Yee Ng et al., 2009:516). The child thinks about the experience and reflects on it, this then helps the child to come to an understanding of the reasons behind the happenings of some events in life. Reflective observation is an important process that helps children to describe a situation objectively and come to an understanding of why things happen (Kolb and Kolb, 2005:200).

Abstract Conceptualization: The reflections from stage two are assimilated and distilled into abstract concepts from which new implications for action are drawn (Armstrong & Fukani, 2008:45). Kolb (1984:38) concurs that the stage requires learners to distil their reflections into abstract concepts from which new implications for actions are drawn.

Active Experimentation: This stage actively tests the implication of concepts in the new situations to serve as guides in creating new experiences (Kolb & Kolb, 2005:201). It can then be argued that by using this theory the children will be able to apply the learnt experience to real life situations.

Experiential learning will be explored through what has already been written about DRR and its integration in the curriculum of schools. To facilitate this learning, a specific research methodology will be employed.

1.7 RESEARCH METHODOLOGY

1.7.1 Literature Review

Literature review is defined by Ridley (2012:1) as “a structured evaluation and classification of what reputable scholars have written on a topic”. Literature review provides the background and context for the research problem and explains the origins of the problem (Tlhoalele et al., 2007:561). It is what is already known about the topic, concepts and theories that have been applied already, research methods applied before controversies and clashes on the topic, and the key contributors (Bryman, 2012:8; Ridley, 2012:15; Villian and Vogt, 2011:654). It can be argued that a literature review helps in finding out what is already known about the study area, what contributions other researchers have made to the knowledge relevant to the intended study and the history of the topic under study. The challenge of doing a literature review will be sifting through the huge amounts of data, looking for what is relevant to the topic, and identifying important information which might be missed in the process.

For the purposes of this research, a literature review will give the past and current trends in DRR integration in school curriculum and the best practices. It will also provide the researcher with answers to the current problems relating to the topic and how related situations have been dealt with.

The first step will be to look at the concept of DRR education and the theories of learning from the literature available. This information will then be linked to DRR integration in the school curriculum in Botswana. In conclusion the study will propose how best DRR can be included in the primary school curriculum in Botswana.

The literature review will include the following secondary sources.

1. Botswana Disaster Management policy documents,
2. Botswana Primary School Syllabus,
3. Conference papers
4. Books
5. Internet sources
6. Academic Journals and
7. Research reports relating to the topic.

1.7.2 Research design/Approach

This research will follow a mixed method research approach which is a combination of qualitative and quantitative approach. Mixed method is defined by Du Plessis et al (2010:459) as a method that involves qualitative and quantitative being mixed in more than one stage of the study. Greene & Caracelli (1997:10) state by using mixed method the strength of one method will overcome the weaknesses of the other. Mixed method approach will be used so that the results of the study are well represented.

The quantitative aspect of the research approach will use the Likert scale questions. A Likert scale involves a series of statements that respondents may choose from in order to rate their responses to evaluative questions (Vogt, 1999:336; Teddle & Yu., 2007:99). The responses are ordered in such a way that one response is greater than the other. A

five-point scale will be used which ranges from “strongly disagree” to “strongly agree” (Stefanowski, 2013:2).

Apart from the Likert scale used in the quantitative aspect, the qualitative aspect will use open ended questions. This will give a qualitative insight into the status quo. The research will combine 30 educators from different schools in Gaborone. The schools will include government schools and private schools, these will be good representatives of the schools population. Five Curriculum coordinators, who were involved in the curriculum review of 2007, will be included because they will provide insightful data on the teaching of hazards and DR. Three disaster risk management specialists will be selected to provide the needed interpretation of the policies of disaster management in Botswana.

1.7.3 Population and sampling

Bryman (2012:187) defines population as the universe of units from which the sample is to be selected. Bless & Higson (2006:99) concurs that, “a population is a set of elements that the researcher focuses on and to which the results obtained by testing the samples should be generalized”. Besides being people, units can also be towns or organisations.

A sample then comes from the population. It is a segment of the population that is selected for investigation and it is usually applied where testing every single unit is impossible (Bryman, 2012:187). For the purposes of this research study, purposeful sampling will be used. Purposive sampling is defined as selecting units based on specific purposes associated with answering a research study question (Teddlé & Yu, 2007:54; Bryman, 2012:418). It is a type of sampling in which units are deliberately selected because of the important information they can provide, that cannot be provided by other units (Maxwell, 1997:23). It is easier to implement, even when problems of finance and time arise. It will be used for this research because the sample frame should include people who are familiar with curriculum development and DRR issues. The participants include educators, curriculum coordinators, and specialists in DRR issues

In addition to purposive sampling, the researcher will also use snowball sampling to select more respondents for the study. Snowball sampling is when a researcher makes initial contact with a small group of people who are relevant to the research topic and then uses them to establish contact with other individuals that might be relevant to the research (Bryman, 2012:202). The concept of disaster risk management is fairly new in Botswana, and very few people are familiar with its application. For the purposes of identifying the segment of the population that is familiar, or have studied disaster risk management, it will be important to use the three identified specialists from the Disaster Management Department in the Government of Botswana to further identify additional respondents to interview.

1.7.4 Instruments for data collection

The researcher will use a semi structured interview as a data collection method. A semi structured interview is defined as an interview that uses a questionnaire that would mould the respondent's frame of reference, whilst at the same time giving him/her the freedom to respond in whatever way he/she likes (Jarbandhan & Schutte, 2006:678). Semi structured interviews are of great value when the researcher has a clear vision of the desired knowledge and still creates room for exploration (Auriacomb, 2010:477). This type of data collection will be used because it gives room for exploration on the topic and getting more insights as the respondents give more information on the topic than what has been asked. The results will be analysed qualitatively.

The structured questionnaires will be used for quantitative data collection. Structured questionnaires use closed/prompted questions with predefined answers (Harris & Brown 2010:55). Possible responses are supplied in advance and the respondent indicates his/her choice on Likert Scale (Kendall, 2008:45). Analysis will be done in line with the central theoretical statement of the study which is that of experiential learning.

The research will also collect secondary data on the subject. De Vos et al., (2005:314) refers secondary analysis to the analysis of any written material that contains

information about the phenomenon that is being researched. This research will use secondary data from Disaster Management, Curriculum Unit and Ministry of Education and other reports from development agencies on the subject.

1.8 LIMITATIONS AND DELIMITATIONS

The condition that restricts the research is called limitation. Doing a research brings with it some challenges and it is important to find ways of counteracting the challenges at the research design stage (Mouton et al., 2006:579). The anticipated challenges in this research are as follows:

1.8.1 Resistance from the participants

Since the researcher is not a citizen of Botswana, the bureaucracy in the issuance of a research permit might impede the progress of the research. The researcher will apply for the research permit early before commencing data collection.

1.8.2 Financial and time limitations

The researcher works full time as a teacher, so she might encounter problems with getting time off from work in order to collect the data. The researcher will apply for leave of absence in order to conduct the research.

1.8.3 Language barrier

The researcher might encounter language barriers with a few participants who might not feel comfortable using English as the language of communication. The researcher will use the service of a volunteer interpreter when there is a need.

1.9 ETHICAL CONSIDERATION

Ethics are defined as a set of widely accepted moral principles that offer rules for, and behavioural expectations of the most correct conduct, experimental subjects and respondents, sponsors, other research assistants and students (De Vos et al., 2005:350). Participants in the research study will be treated with respect. The

information regarding the purpose of the study research will be availed to the participants so that they are fully aware of the significance of their contributions.

Confidentiality will be guaranteed and be sort first before engaging them in the research. No coercion of participants in the research will be done, their participation will be voluntary, based on the information given to them. Prospective research participants should be given as much information as might be needed to make an informed decision about whether or not they wish to participate in the study (Bryman, 2012:138). The right to withdraw at any time (Creswell, 2003:64) will be given to them as an option. In this study the researcher will not distort the information through the deliberate manipulation of data gathered. Deception occurs when researchers represent their work as something other than what it is (Bryman, 2012:142).

1.10 SIGNIFICANCE OF THE STUDY

Disaster Risk Reduction is what is being advocated for by a number of development agencies that include UNICEF, through its Disaster Risk Reduction and Education program (2012), Action Aid's Building a Culture of Safety and Resilience through Schools (2006) and ISDR's Disaster Risk Reduction Begins at School (2006-2007).

The findings of this study will help in making the government of Botswana aware of the benefits of incorporating Disaster Risk Reduction into the Primary education curriculum. The study will also bring out the social gains of targeting young children in DRR programs and how this will transform their lives and pass on the skills learnt to the next generation.

1.11 PROVISIONAL CHAPTER LAYOUT

The mini-dissertation will follow the following outline:

Chapter 1: Introduction and Problem Statement

This will introduce the topic and provide the background to the problem to be investigated. Research questions, Objectives, terminology fall under this chapter.

Chapter 2 and 3: Literature Review

This will include some educational theories and how they can be used in DRR education, the international perspective on DRR integration education, as well as the Botswana perspective. International and Botswana DRR policies will be explored. Arguments relating to the topic from other researchers will also be included.

Chapter 4: Research Methodology

This chapter will define the research methodology applied in this research as well as summarising research questions and objectives.

Chapter 5: Findings

Chapter 5 will present the findings from data collection and provide a discussion of the data in relation to what other researchers discovered in related researches.

Chapter 6: Critical Discussions

The last chapter will present the discussion of the findings.

Chapter 7: Conclusion and Recommendations

This chapter will present the conclusion and a few recommendations.

CHAPTER 2

2.0 INTRODUCTION

The previous chapter provided an overview of the orientation and problem statement to the study. It highlighted how children are heavily affected by disasters, as the disasters cause death, injuries, destruction of infrastructure which includes schools and disruption to school attendance. The role played by disaster risk reduction education in reducing the vulnerability of people and improving their resilience cannot be over emphasised. Several examples of children using their knowledge acquired to save lives during disasters were given in the previous chapter.

This chapter will contain the importance of integrating DRR into the curriculum, and examples of countries that have already integrated DRR in their curriculum will be discussed in order to save as best practices for Botswana. Reasons for exploring learning theories in DRR education, and the theoretical framework on disaster risk reduction education will be discussed looking at three theories, (experiential learning theory, theory of Multiple Intelligence and Self Theories) that can be used in DRR learning. Reasons to why experiential learning (EL) theory is the most suitable approach for this study are also discussed. The rationale for the application of EL will be discussed and how EL can be reinforced using the five dimensions of DRR learning. The chapter concludes by assessing how Botswana is faring in DRR integration into its primary school curriculum as well as how Botswana can use EL to improve current integration of DRR.

2.1 THE IMPORTANCE OF INTEGRATING DRR INTO SCHOOL CURRICULUMS

Disasters can bring widespread disruption and damage to both the child's home and services accessed by children like school and recreational facilities (Venton & Venton, 2012:5; Sharpe, 2009:2). This can have a greater psychological effect on children resulting in children needing protection from abuse, physical harm, psychological

distress, separation from family and recruitment into armed groups. (Ireland & Schoch 2013:4, UNESCO, 2010:33). The United Nations (UN) Convention on the Rights of the Child 1990 recognises that every child has both the inherent right to life (Article 6) and the right to education (Article 28). These rights may be compromised by the known, unknown and recurring hazards (Chang, et al 2010:329). Disasters also impact on education in different ways, these include the following (UNESCO, 2011:33; Tunner et al 2009:56; Basur & Samet 2002:193).

- a. Disruption of the school calendar as schools are used as evacuation centres. This reduces learning hours and lowers syllabus coverage leading to students' poor academic performance.
- b. Lack of access to school due to destroyed bridges, disruption in transportation system which may cause high absenteeism.
- c. Damage to school infrastructure may cause perennial shortage of qualified staff as they will shun being deployed to such areas. This shortage of staff will in turn affect enrolment, quality of education and overall performance of students.
- d. Homeless families maybe moved to temporary shelters which may be far away form education facilities. This may also lead to absenteeism due to distance,
- e. Children are moved to schools and areas that have not been affected by disasters, but this causes overcrowding of certain schools. This overcrowding strains teaching resources and hampers education efforts.
- f. Government, including the Ministry of Education is weakened as the resources allocated for educational purposes will be channelled towards recovery efforts. Inputs such as hiring of teachers, development of physical facilities and formulation and distribution of learning material are compromised. This hampers the effectiveness and efficiency of the overall learning process.

The integration of DRR into curriculum is important as there are several benefits to this. DRR can be integrated into education to help teach children how to identify and respond to risks in their community, thereby reducing vulnerability and building resilience in children (Wisner 2006:23, Shaw, 2012:232; Venton & Venton 2012:5). There will also be

a significant reduction of deaths and injuries due to better preparedness and increased capacity and knowledge regarding what to do in an emergency (Barakat et al, 2010:21; Wisner 2006:23). DRR education can be instrumental in building knowledge, skills and attitudes necessary to prepare for, cope with and adapt to disasters (Paton & Jackson, 2002:78, Shaw, 2012:232; Mangiane, et al., 2013:130). School attendance and learning is increased, leading to longer life term earnings especially for girls (Venton & Venton 2012:12; Campbell & Yates, 2006:10). Children will have a greater sense of confidence and security, and will feel empowered and aware of activities that contribute to a reduced psychosocial impact of disasters (Bild & Ibrahim, 2013:14; Tunner et al, 2009:57). Students also act as important information disseminators to everyone in the community relating to DRR and response (Campbell & Yates, 2006:10, Basur & Samet, 2002:194). The benefits of integrating DRR into education system can also be illustrated upon a review of selected case study countries.

2.2 COUNTRIES THAT SERVE AS BEST PRACTICES FOR DRR CURRICULUM INTEGRATION

Disaster Risk Reduction in School Curriculum: Case Studies from Thirty Countries by Selby & Kagawa by (2012) studied how 30 countries integrate DRR using different learning approaches. A selection of country case studies including Japan, Madagascar, Cuba, and Georgia are discussed as best practice examples for Botswana to consider.

2.2.1 Japan

DRR education in Japan is renowned for its emphasis on disaster preparedness. A wealth of DRR education material has been produced by different stakeholders (Wisner 2006:15). DRR related topics and themes appear in a few subjects (like social studies and science) in primary school. In the lower primary school it emphasises on local specific disasters and response initiatives and upper primary covers mechanisms of volcanic activities and earthquakes (Selby & Kagawa 2012:138).

The Japanese education system offers DRR education through infusion into existing subjects (Social Studies, Science and Health Education) and a period of integrated

study where the teacher is encouraged to use curriculum space to offer disaster issues and topics relevant to students in a particular locality. Field trips which fall under field experiential approach to learning, are used in doing hazard mapping and fire drills. The experiential learning method of using puppets to pass on DRR messages for young students and playing DRR related games are also employed to create awareness of DRR. DRR experiential learning and linking school and community has been found to be important and effective in Japan (Shaw & Yukihiro, 2014:1).

Antonowicz et al (2012: 6) has found that Japan's integration of DRR into their school curriculum has empowered students to identify and address a variety of forms of risks and disasters.

2.2.1.1 Teacher Professional Development

Japan's MEXT trains supervisors and key personnel who then go on to train teachers in their own locality (Chinoi, 2007:53). Teacher reference materials has been developed and distributed by MEXT and the Cabinet including learning support material for the students (Shaw & Yukihiro, 2014:3).

2.2.2 Madagascar

Madagascar uses the infusion approach where DRR is included in a range of subjects across the curriculum, especially in grade 4 and 5 where the student handbook offers explanations and advise on what to do when confronted by a hazard (USAID/OFDA, 2012:41; Selby & Kagawa 2012:122). Grade 6 treats DRR through Science and Technology subject where it is covered in the topic, management of water (MoNE & MOHA, 2006:2; Selby & Kagawa 2012:124).

Madagascar emphasises a lot on environmental integration into all disciplines, and it is this emphasis on environmental awareness that has informed DRR curriculum development (MoNE & MOHA, 2006:2). It uses active participatory learning which is guided by experiential learning (Selby & Kagawa 2012:121). Simulation exercises, role playing and drills are used to establish the students' level of understanding. This has been of benefit to the students in Madagascar as DRR education has managed to

reduce vulnerability and built resilience in children (UNISDR, 2007:15). Children are also acting as agents of change by disseminating DRR information to everyone in the community.

2.2.2.1 Teacher Professional Development

Madagascar has DRR related teacher training for grades 4 through to 7 teachers which runs for three days and is conducted by members of the education cluster (MoNE/MoHA, 2006:44)

2.2.3 Cuba

Hurricanes are Cuba's most significant disaster. In response Cuba has established a strong national curriculum covering response to hurricanes and disaster preparedness (Campbell & Yates 2006:7; Wisner, 2006:14). Cuba's disaster teaching materials are produced by Cuba Red Cross. These materials contain safety messages that are reinforced at home by what parents learn and practice through disaster drills at their workplaces (Selby & Kagawa, 2012:157). Cuba uses diverse teaching methods such as work camps, risk mapping and child to child teaching to operationalize DRR in school curriculum (Wisner 2006:13).

Students in the third and fifth grades of primary school have topics in civil defence included in their curriculum. DRR is infused in environmental education curriculum with a lot of emphasis on protection of the environment through role playing and drama guided by experiential learning. This has empowered the students to be aware of activities that contribute to better preparedness and reduced vulnerability. Cuba's achievements in DRR integration in school curriculum has been extremely effective judging by the low numbers in hurricane related deaths (Thompson, 2007:14).

2.2.3.1 Teacher Professional Development

Teachers receive guidance from Ministry of Education on pedagogical approaches (Selby & Kagawa, 2012:157).

2.2.4 Georgia

Georgia's DRR integration into school curriculum began in September 2011 (Bild & Ibrahim, 2013:14). Students were consulted on how the curriculum could be made interesting. Much emphasis was placed by students on the importance of providing interactive activities to aid the learning process (Selby & Kagawa, 2012:65).

As such Georgia has introduced two special initiatives which are, the addition of DRR themes to mandatory Civil Protection and Safety courses for grades 4 and 8, and Head of Class Hour programme for grades 5 to 9 (Beukes et al 2012:61). The head of hour programme includes a range of practical activities that include hazard mapping in the school and environmental campaigns (UNICEF, 2011:69). The importance of Head of Hour program is that children are empowered to disseminate DRR messages across the community they live in (Selby & Kagawa, 2012:67)). It also incorporates not only discussions but a range of practical activities such as excursions, role play, hazard mapping and developing school disaster preparation plan, giving them the opportunity to learn by doing, activities that are experiential in nature (Shreve & Kelman, 2014:221). DRR education in Georgia is guided by experiential learning approach. UNICEF (2011:7) acknowledges that head of class hour approach, with its emphasis on interaction, action and practice appears to be succeeding in ways not achieved within core subjects, thereby playing a significant role in disseminating DRR messages across the community.

2.2.4.1 Teacher Professional Development

Teachers receive training through a seven hour workshop delivered by experts from the National Curriculum Centre and Emergency Management Department (UNICEF, 2011:8). The training involves a lot of practical exercises and assistance in using the Interactive Methods Guide (Selby & Kagawa, 2012:67)

There are many theories that explain students' disaster learning however, Experiential Learning theory is dominant in most of the countries that integrate DRR into the primary school curriculum as shown by the examples above. However, in order to explore the importance of EL in guiding the integration of DRR into Botswana curriculum two more theories of learning will be discussed. These are the multiple intelligence theory by Gardner, and the self- theories by Dweck.

2.3 DISASTER RISK REDUCTION INTEGRATION INTO CURRICULUM: THEORETICAL FRAMEWORK

The three theories mentioned below will be discussed in order to highlight the choice of experiential learning as the best suited for this research.

2.3.1. The theory of multiple intelligences (MI)

Gardner & Hatch (1989:5) argues that every person's level of intelligence consists of nine distinct intelligences which include, logical mathematical, linguistic, spatial, musical, and interpersonal. This theory proposes that a good curriculum offers a wide scope and choice for teachers to teach the important points, whilst allowing students leeway to discover for themselves. Thus it is argued that a combination of foundation principles and student exploration could contribute to successful DRR education (Gardner & Hatch 1989:5; Haier & Jung, 2007:331). The theory of MI sees intelligence as dominated by a number of abilities and one needs the nine intelligences to fit the criteria (Sharpe & Kelman 2011:331). Multiple intelligences, as it pertains to the disaster context are summarised in Table 1 below:

Table 1: Examples of Multiple Intelligences in Disaster context (Sharpe & Kelman 2011:331)

Multiple intelligences	Disaster-related examples
Linguistic intelligence – language based intelligence	Pupils with this type of intelligence are happy reading, synthesising and presenting materials, which is useful for getting students to write educational material. Example: pupils can write a newspaper article on how to prepare for disasters.
Logical-Mathematical intelligence	Pupils manipulate data easily. Example: calculate distance between hazards.
Musical-Rhythmic intelligence	Is the capacity for children to think in music, recognising and manipulating aural patterns. Example: a rap song that help others know what to do in an emergency.
Bodily-Kinaesthetic intelligence	This involves activities where one's body or body parts can be used to solve problem, such as through dance and theatre. Example: demonstrations through flood risk reduction dance and appropriate action for a thunderstorm.
Spatial intelligence	This is ability to represent the spatial world internally in one's mind. Example: hazard mapping exercises, running participatory mapping exercises for DRR.
Naturalistic intelligence	This is the ability of students to discriminate among living entities namely plants and animals, and sensitivity to other features of the natural world such as clouds and rocks. Example: planting trees and grass on steep slopes around the school can prevent landslides or sedimentation flow to water sources which may cause water contamination.
Intrapersonal intelligence	Shows an understating of oneself. Pupils with this kind of intelligence know their identity and place in the community,

	know what they can and cannot achieve, and know how to seek help. Example: Students can form a club where they can share DRR knowledge and knowledge about their community.
Interpersonal intelligence	Is the ability to understand other people which is important for those trying to inspire others. Example: present at school assembly the hazards that they have identified in school and how to deal with them.

A person with MI is believed to be able to solve problems in life for: for example when to evacuate, offer service that is valued in a culture by highlighting the importance of traditional knowledge in a community and create solutions to problems which involve gathering new knowledge (Greenhawk, 1997:63; Hoerr, 2004:45). The MI curriculum is advantageous in many ways. Specifically a curriculum based on multiple intelligence allows students to be in control of their own preparedness and they are able to understand and identify vulnerabilities and hazards in their own communities using their own unique abilities (Earley & Mosakowski, 2004:140). With this approach pupils are able to deal with disasters without the help from the older members of the community because they have acquired the skills necessary to handle the disaster problems (Cassidy, 2004:423). Additionally the approach allows teachers to undergo training and observing how children learn in the classroom (Earley & Mosakowski, 2004:140). This allows them to be flexible to student needs and preferred method of learning (Cassidy, 2004:125; Gagne, 1984:381).

MI has been applied in many different country contexts with relative success (Sharpe & Kelman, 2011:331; Khalaf-Ibnian & Hadban, 2013:151). However, there are critiques that question the efficacy of the method. Foremost of these critiques is that there is insufficient evidence to support the theory that several different intelligences exist. Studies by Gardner & Hatch (1989:8) state that it is not possible to validate the existence of MI (Waterhouse, 2006:248; Klein, 1997:378). This is because it is not practical to cater for large classes of students by giving them their individual tasks

according to their level of intelligence (as people have diverse talents and it will also be problematic for evaluation as some skills are easier to execute than others, such as mathematics skills versus interpersonal skills). Instead, the theory of general intelligence propagates as the correct theory of intelligence as it has been effectively proven and tested as compared to MI (White, 2004:54; Waterhouse, 2006:249). General intelligence is what we use every day, which includes our ability to decide, solve problems and reason. Eisner (2004:33) highlights another critique, by stating that using MI makes it difficult to know how pupils are doing because they are taught using different curriculum and assessment methods other than standardised tests, as such the ability to make comparisons across students, is compromised (Eisner, 2004:33). This becomes a challenge when students have to be assessed on their DRR skills, it means the teacher has to give an assessment per individual needs. Some of the activities for DRR education need group work, which may prove difficult to coordinate as well.

Another theory that can also be used in DRR curriculum integration is The Self Theories.

2.3.2 The Self-theories

The main proponent of the self- theory is Carol Dweck. The self-theories are divided into two groups, which are, the entity theory and incremental theory (Sharpe & Kelman, 2011:333).

2.3.2.1 The Entity theory:

This is also known as the theory of fixed intelligence. This theory has the perspective that when students believe they have a certain amount of intelligence or knowledge of a subject the knowledge is final and nothing more can be added to it (Blackwell et al, 2007:24). The students believe their abilities are fixed and they reject valuable learning opportunities if it is going to expose their shortcomings (Dweck, 1999:23). When it comes to disasters the students believe that the disasters are too big or beyond their control and believe it is the duty of elders in the community or government to protect them.

The weaknesses of fixed intelligence as given by Blackwell et al (2007:249) is that it does not give the students leeway to expose and remedy their weaknesses because any weakness expose a permanent lack of ability. Moore & Shaughnessy (2012:174) concurs that it leaves students with a few options of reacting to setbacks, because they lose interest as they lose confidence.

The second group of the self-theories is the incremental theory.

2.3.2.2 The incremental theory:

This is also known as the theory of malleable intelligence (Dweck, 1999:23). Pupils believe their intelligence is not a fixed trait but something that can be cultivated through learning (Dweck, 1999:23). These students believe with hard work and effort they can become more talented and increase their intellectual abilities. They focus on the idea that everyone can improve knowledge and intellect over time. Dweck (1999:25) termed this 'the growth intelligence'. Moore & Shaughnessy (2012:175) believe the students with incremental intelligence take charge of any situation and work to overcome the setbacks, it also leads students to want to master new tasks, acquire new skills and the will to take risks and make mistakes.

The incremental theory can be applied by both the teachers and students as a way to better understand and deal with disasters. Sharpe & Kelman (2011:333) and Cohen et al, (1999:1303) concurs that students cannot move to a level of disaster intelligence if they believe in their vulnerability, avoid taking responsibility and believe they are powerless to act. In contrast, those who have developed to a level of disaster intelligence through incremental theory believe disaster risk reduction measures and the knowledge thereof are within their grasp and will improve their level of disaster resilience.

The innate advantage of the incremental theory is that educators and parents can then further promote the students' self-esteem and self-concept which will result in an increase of pupil's achievement (Cohen et al, 1999:1304). This will empower students to make personal decisions for their safety when a disaster happens.

The disadvantage of the incremental theory is that the acquiring of new skills is time dependent. Since students learn skills over time, this may work against them when it comes to skills in DRR that need mastering as a matter of urgency. For instance it will be difficult to learn new behaviour within a disaster context, such as, how to purify water to prevent cholera.

The third theory that will be looked at in this study is The Experiential Learning Theory. This theory will be discussed in more depth than the previous two as this is the theory that will guide the study. Reasons for this preference will also be alluded to.

2.3.3 The experiential learning theory (EL)

Research has proved that human beings information intake can be processed in the following percentages as per Table 2 (Kayes, 2002:132; Sharpe, 2009:21).

Table 2: Rating of information intake (Adapted from Sharpe, 2009:21)

Percentage	Activity
5%	Of a lecture
10%	Of what is read
20%	Of what is gleaned from audio visual sources
30%	From demonstrations
50%	From discussions with peers
75%	Through practice by doing such as learning to drive
90%	From teaching others through peer education

Learning through practice and teaching others through peer education are rated as the best for information retention. The two activities form the basis of the EL to be discussed in the section below.

Kolb (1984:38) defines experiential learning as “a process whereby knowledge is created through transformation of experience”. It is a philosophy and a methodology by which educators purposefully engage with students in direct experience and focused reflection. This is in order to increase knowledge, develop skills, and clarify values

(Armstrong and Fukami, 2008:33). Experiential learning is also known as learning by doing (Sharlanova, 2004:36), and is based on three assumptions (Ord, 2012:55) which are listed below:

1. People learn best when they are personally involved in the learning experience
2. Knowledge has to be discovered by the individual if it is to have any significant meaning to them or make a difference in their behaviour.
3. A person's commitment to learning is highest when they are free to set their own learning objective and are able to actively pursue them within given frameworks.

This goes on to authenticate the well-known maxim penned by John Dewey (1938:56) which says, "*There is an intimate and necessary relation between the process of actual experience and education*".

Experiential learning (EL) theory is presented by Kolb (1984:38) and Baker et al (2002:88) as a holistic perspective, combining experience, perception, recognition and behaviour. Alam & Collins (2010:57) and Cox et al (2010:5) argues that, "experiential learning is important in disaster management as learning results from felt or close range interpretation of disaster and development crises". EL situates experience at the core of the learning process and has the potential to motivate students to action (Shaw, 2012:239; Dewy, 1938:20; Kolb, 1984:39). It is theorised that learning from experience provides the foundation of the stimulus for learning, that learning is a socially and culturally constructed process influenced by the socio-emotional context in which it occurs, and that students actively construct their own learning experiences (Doud et al, 1993:67; Warner & McGill 1989:115). The experiences may include events that the student has experienced in his/her life, current life events and those arising from activities that the student participate in at school. It is argued that experience can deviate from being direct individual experience to socially interactive. Sharlanova (2004: 37) and Cox et al (2010:5) concurs that students need to analyse their and others experiences by reflecting, evaluating and reconstructing it in order to draw meaning. The aim of the experiential learning approach is to promote a participatory student-

centred approach, emphasising on direct management, the construction of meaning by the learner and rich learning events as well as making students learn from their mistakes, consequences and achievements (Sharlanova, 2004:36; Doud et al, 1993:67; Shaw, 2012:239)).

Experiential learning theory uses experiences of the children in their everyday lives, thereby building children's capacity in DRR (Concern, 2011:14). For example a child may learn that an iron is not to be touched after burning their fingers. It helps develop the whole child who can realistically assess his/her level of risk and the knowledge that is gained can lead to behaviour change (Yee Ng et al., 2009:519). Experiential learning touches on experience, reflecting, thinking and acting in a recursive process that is responsive to the learning situation and what is being learnt (Armstrong and Fukami, 2008:41; Cox et al, 2010:5). It is argued that, practising crouch, drop and roll for fire, and drop, cover and hold drill for earthquakes can be some of the practical classroom activities. Students can present the drills to the whole school in order to understand what makes effective DRR education. This then exposes the critiques of experiential learning (Sharpe, 2011:330).

The EL theory is a model for building a learning experience that takes students through a cycle of learning (Gore & Zeichner, 1991:120). The model helps teachers design lessons that are experiential, interactive and that develop critical thinkers (Risner, 2001:5). It is guided by a four stage learning cycle, (concrete experience, observation and reflection, abstract conceptualisation, and active experimentation (see figure 2), whose elements help in the development of the DRR integrated curriculum as knowledge is created through the transformation of experience (Kolb, 1984:39; Sharpe, 2008:26). McLeod (2010:12) also believes that, effective learning occurs when the following four steps take place:

1. The learner has concrete experience;
2. The learner reflects upon their new experience
3. The learner analysis their reflection, observations and create their own conclusion;

4. The learner uses these conclusions to test future situations;
After 4th step the process repeats itself for every new experience.

Figure 2: An explanation of Lewin's experiential learning model cited in Ord (2012:56), will be briefly discussed below.

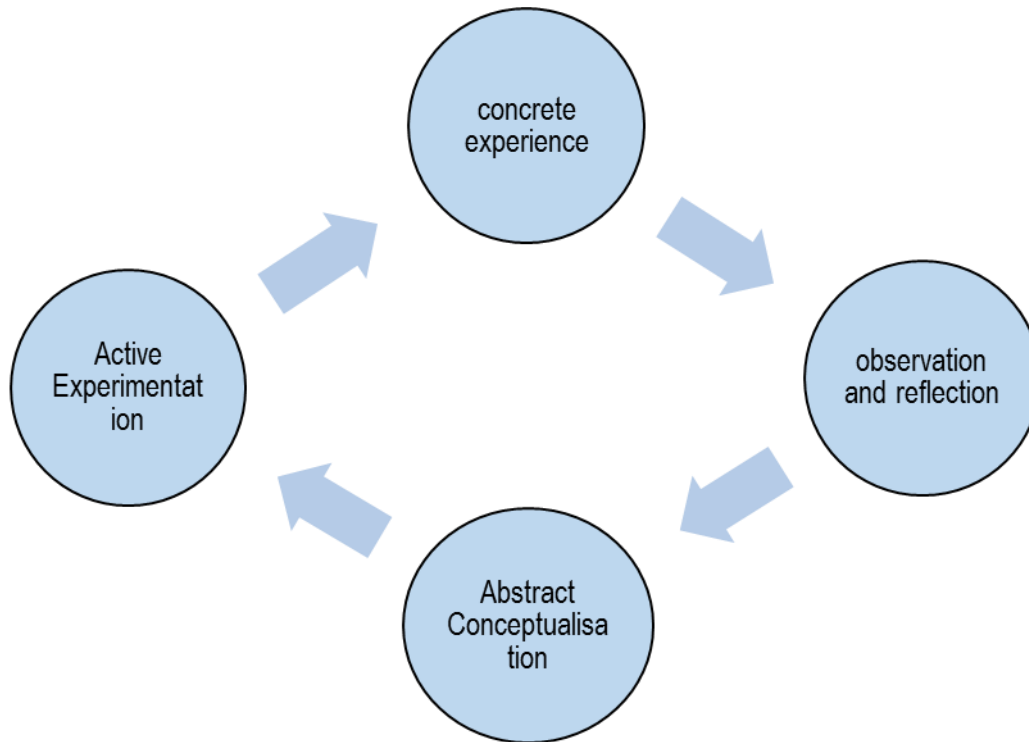


Figure 2: Experiential learning model: Source: Ord (2012:56)

The model represents the order in which learning takes place (Sharlanova, 2004:38; Lewis & William, 1994:18). The cycle can be entered at any point and should be seen as a continuously evolving spiral (De Mers 2010:6; Gentry, 1990:10). These stages will be briefly expanded upon.

2.3.3.1 Concrete Experience:

The student is an active participant when there is engagement in a particular situation and then the pupil observes its effect (Ronan & Johnston, 2001:76; Sharlanova, 2004:38) Concrete experience focuses on tangible elements of the immediate environment. When a student grasps an experience, he/she has to use that experience

to manage unforeseeable events. The experience become useless if the student does not do anything about it.

Concrete experience involves all students in an activity that is active and interactive (Anderson et al 2004:188). The first exposure to the new concept (in a classroom lesson, it is termed the introduction) may seem unrelated to the learning objective (McLeod, 2010:18; Svinicki, 1987:141). This is how students are introduced to new concepts. Later it ties into the learning objective. Students address learning objectives from a personal involvement with a human situation (Risner, 2001:5). After this the students discuss and report their experiences to the whole class. Sharing the experience is the key component of sharing the learning (Gore & Zeichner, 1991:124). Lastly the students put the knowledge or skill to work in a practical application (Bolan, 2003:11; Risner, 2001:5).

When students get together to share hazard knowledge in their environment and the effects of disaster, it helps bring the students closer to reality. The students may share their newly acquired skills with others at assembly, at home and in the community, thereby helping in awareness raising. These tangible events then become the basis for reflective observations (Kayes et al, 2005b:91; Yee Ng et al, 2009:516).

2.3.3.2 Reflective Observation:

Student thinks about the experience and reflects on it, this then helps the student to come to an understanding of the reasons behind the happenings of some events in life (Shaw et al, 2004:40). Reflective observation is an important process that helps students to describe a situation objectively and come to an understanding of why things happen (Kolb and Kolb, 2005:200). During that process of reflection students have to be impartial in order to see the implications and connections, and to appreciate different points of view and look for the meaning of things (Lewis & William, 1994:19). Students address learning objectives from observation rather than action (Ronan & Johnston, 2010:76). They learn by feeling specific experiences (De Mers, 2010:7). Reflective observation relies on internal processing which give rise to conceptual interpretation which is termed abstract conceptualization (Triandis, 2006:23)

2.3.3.3 Abstract Conceptualization

Abstract conceptualization relies on conceptual interpretation and symbolic representation of the experience (Ng et al, 2009:513). The reflections from Reflective Observation are assimilated and distilled into abstract concepts from which new implications for action are drawn (Armstrong et al, 2008:45; Lewis & William, 1994:102; Kolb 1984:38). Students build simple theories from their understanding of concepts such as hazard knowledge or what causes a volcano, this will then guide their future actions. Students are more interested in reading about the concept, exploring and analysing models, they also prefer getting information from their teachers and contemplate new information. Such students could serve as catalysts to come up with a school DRR policy as they are likely to engage in critical thinking.

This stage is problematic for primary school students as it calls for students to read and distil complex information. Young students learn best when they are practically involved than when they have to read and analyse complex written content (Bolan, 2003:15; Bread & Wilson, 2002:89). Abstract conceptualisation can only work well if they are to immediately transform the information into action, which then becomes active experimentation.

2.3.3.4. Active Experimentation

This stage actively tests the implication of concepts in the new situations to serve as guides in creating new experiences (Kolb & Kolb, 2005:201; Gentry, 1990:15). By using this theory the students will be able to apply the learnt experience to real life situations.

Active experimentation is more than learning by doing (Svinicki, 1987:145). Students approach learning objectives by influencing people and events through action or changing the situation (Hansman, 2001: 43; Bolan, 2003:11). When students share their knowledge of hazard and disasters with friends, this empowers them and helps to save lives when the disaster happens because everyone knows what to do. The students also have an opportunity to extend beyond the immediate learning objectives by trying the new knowledge or skills in another application or environment (Alley & Jansak, 2001:

5). This can be through community clubs where they share information on disaster preparedness and mitigation.

2.3.4 Best Practices for EL

An example where experiential learning in a disaster context has been used is in Bangladesh, where communities that have experienced cyclones have learnt a variety of locally based practices to protect themselves against further cyclones, demonstrating remarkable levels of coping in context of extreme environmental change. (Alam & Collins 2010: 60; Yamori, 2009:95). An additional example of EL can be found with emergency services, throughout the world that hone their responses to fires, diseases epidemics, terrorist attacks and a myriad of major incidents based on their analysis and reactions to previous events or simulation exercises (Petal & Zadkhah 2008:133). This supports Shaw (2012:240)'s notion that learning is about meaningful experiences in everyday life that lead to a change in an individual's knowledge and behaviour.

2.3.4.1 Critiques of Experiential learning

Rogers (1996:108) points out that learning includes goals, purposes, intentions and decision making. It is not clear where these elements fit into the learning cycle. Brookfield (1990:50) and Bread & Wilson (2002:89) weigh in by saying, EL is solely based on the way learners rate themselves and does not rate learning styles preferences through standards or behaviour and only gives relative strengths within the individual learner, not in relation to others. This is regardless of the many factors that influence learning, such as institutional and social aspects of learning.

EL promotes a largely individualised perspective on the learning process as such the teacher will require to prepare more in terms of content and give more time for processing as well as patience as the four stages are time consuming and resource intensive(Moon, 2004:76; Rogers, 1996:110).

These critics are outweighed by the advantages of using the EL theory hence the need to use it within this study context.

2.4 THE RATIONALE FOR THE APPLICATION OF EL WITHIN THIS STUDY CONTEXT

EL aims to promote a participatory learner centred approach emphasising on direct management and construction of meaning by students as well as involving the direct experience of students, their feelings and emotions while increasing skills and knowledge (Shaw, 2012:239; Doud et al 1998:67)

Several studies point to the usefulness of using experiential learning in DRR education. These studies include a study of 400 students in New Zealand who were involved in an EL based hazard education program. At the end of the program evidence showed that the students demonstrated more stable risk perception, reduce disaster related fears and a much greater awareness of important hazards (Roman & Johnston, 2003:1012). Additionally they displayed relative protective behaviour as compared to the students who had not experienced hazard education programs (Carlino, et al 2008:230; Bilgi, 2008:18).

EL uses students' everyday experiences that resonate with experiential learning. A curriculum that uses EL approach provides knowledge about hazards as well as involving students in identifying the hazards especially in their local environment (Yamori, 2009:91; Ronan & Johnston, 2001:89). For example, students in Maun district Botswana, which is prone to malaria could theorize in class about malaria and then go into the local environment to identify breeding areas for mosquitoes that exacerbate the malaria problem. This is termed field experiential learning (Yamori, 2009; 91; Gentry, 1990:11).

In Ghanzi, a district in Botswana that is prone to foot and mouth disease, students could do the field experiential learning by inspecting the fence that demarcates the villages from the game reserve to ascertain how buffaloes break the fence to be able to interact with the cattle from the villages thereby spreading the disease. This kind of learning according to Wisner (2006:10) reinforces basic listening skills, writing, reporting and mapping. This kind of information can then be integrated into the study of Agriculture, Science and Social Studies. This supports Lewis & William, (1994:108) and Bilgi, (2008:190) assertions that DRR education seeks to build knowledge and understanding

of the causes, nature and effects of hazards and is grounded in and reaffirmed by active engagement.

The Convention on the Rights of the Child 1989, affirms that education should be directed towards the development of the child's fullest potential (Article 29) and that the child has the right to receive and express ideas and information through multiple media (Article 13). To support this, students can be involved in surrogate experiential learning where DRR education is integrated through board games, role plays and, drama (Yamori, 2009:92; DeMers, 2010:8). When students take part in lessons before, during and after a drill, it helps them to contextualise and place the drill in a sequence of learning events so that it is not an abstract experience (Lewis & William, 1994:110; Rajabiford & William, 2010:68). It is argued that EL approach is important in DRR education as it links what the students do in class, with what they do at home and in their community. Hence EL is a perfect approach when used with the five essential dimensions of DRR learning.

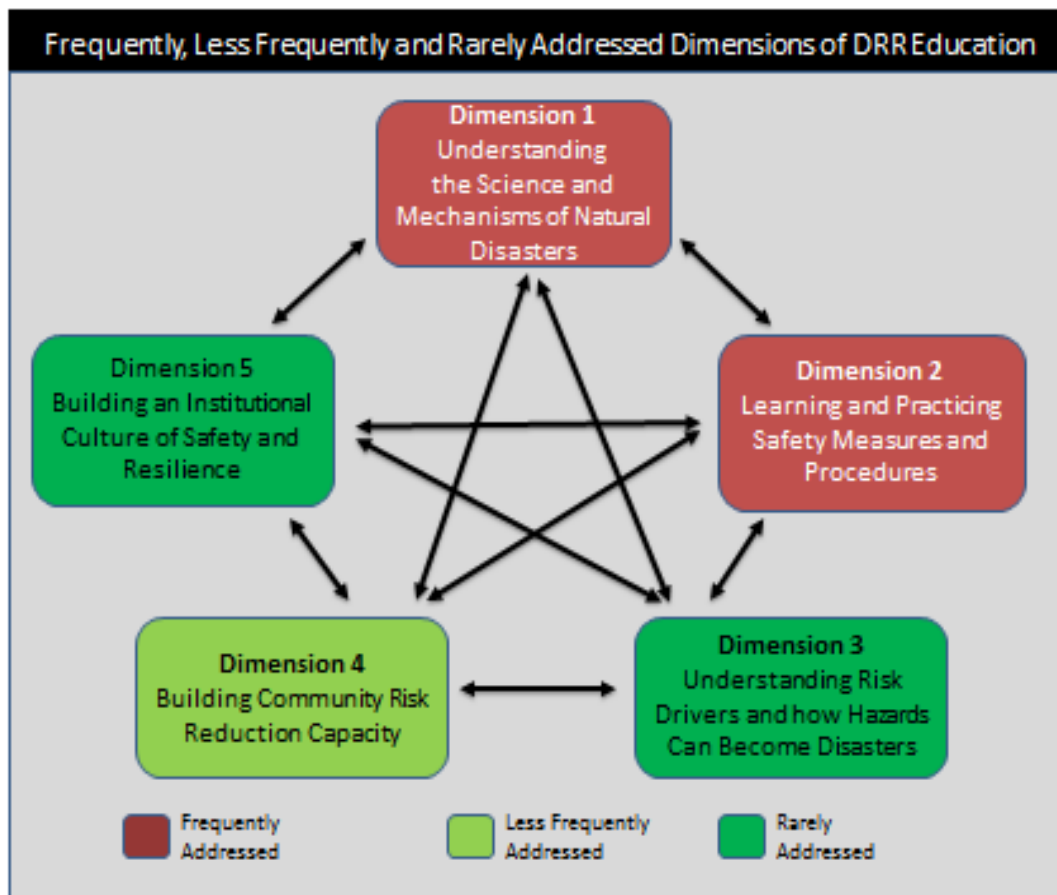
2.5 FIVE ESSENTIAL DIMENSIONS OF DRR LEARNING AND EL

As indicated earlier in a discussion on the importance of DRR education (section 2.1), a number of examples around the world are beginning to reveal the power of DRR integrated into the school curriculum (Petal & Zadkhah, 2008:132; Anderson, 2005:163) such as students who have used their disaster knowledge to save lives and the number of countries that have integrated DRR into the curricula. The five dimensions of disaster risk reduction education are important as they allow for a full and systematic treatment of DRR in the curriculum while encouraging DRR learning in both the school and the community (Selby & Kagawa 2014:10). The dimensions encourage learning through the application of experiential learning, which makes it suited to use in the study context. The five dimensions are represented by the diagram below as taken from Selby & Kagawa (2014:11) and Russel et al (2010:198).

The first two dimensions concern disaster preparedness, the third focuses on vulnerability and the fourth and fifth dimensions are concerned with building resilience (Russel et al, 2010:198). The fourth and fifth dimensions aim to develop student

understanding of the related and potentially complementary notions of adaptation in the face of hazards and mitigation of factors exacerbating disaster risk (Selby & Kagawa, 2014:24).

Figure 3: The 5 Dimensions of DRR Education



Source: Selby& Kagawa 2014:11

2.5.1 Dimension 1: Understanding the Science and Mechanism of Natural Disaster

This dimension is rooted in the physical and natural science and gives a detailed analysis of the science behind the occurrence of disasters, such as cyclones, tsunamis and volcanic eruptions, how they happen, develop and occur (Selby & Kagawa 2014:24;

Benadusi, 2014:175). It is important that students understand the science and mechanisms of those disasters that happen in their local, national and regional environments. In the study of disaster science students could cover activities such as: (Anderson, 2005:173).

1. Why and how natural phenomena of disaster potential happen
2. Where they occur, their frequency and power
3. Trends and patterns in their occurrence

The first dimension resonates with Concrete Experience in EL. Students physically engage with their environment to find tangible elements of the environment that will give them answers to why disasters happen. As they engage with their environment the students are able to find answers to their question.

As the students get answers from their engagement with the environment, they are then able to use the results to manage disaster events. The experience becomes an asset for students to use in life.

2.5.2 Dimension 2: Learning and Practicing Safety Measures and Procedures

This dimension focuses on instruction and practice in safety measures and procedures in the event of hazard, at school, at home or out in the community (Bartlett, 2008:510). This will entail: (Selby & Kagawa, 2014:25)

1. Familiarization with hazards, early warning signs and signals;
2. Instructions in evacuation and sheltering procedures;
3. Emergency drills and exercises;
4. Familiarization with basic first aid and health and safety measures;
5. Guidance on staying safe before, during and after a hazard;

This dimension put students in close proximity and familiarity with the real disasters. As they do the sheltering, evacuation and drills exercises, these activities follow a sequence which when mastered are easier to follow during a disaster, the experiences do not become abstract experience but familiar in times of disasters (Bartlett, 2008:510). The activities resonate with Concrete Experience stage of the EL cycle.

The mastering of the drills, evacuation and sheltering exercises empowers students to save their lives and those of their families and community.

2.5.3 Dimension 3: Understanding Risk Drivers and How Hazards Can Become Disasters

It encourages students to act and be proactive in mitigating risks through a thorough examination of the elements at work in the fundamental disaster risk formula:

$$\text{Disaster Risk} = \frac{\text{Natural Hazard} \times \text{Vulnerability}}{\text{Capacity of Social System}} \quad (\text{Selby \& Kagawa 2014:25})$$

The risk of disasters multiplies with the intensity of the hazard but the level of risk is also exacerbated by prevailing conditions and levels of physical, social, economic and environment vulnerability in any population (Hanser, 2009:55). Some of the vulnerabilities and their causes that students can gain an understanding of are listed in the Table 4 below: (Djalante et al, 2012:780)

Table 3: Vulnerabilities and their drivers

Risks	Drivers
Social risk	Illiteracy and lack of education, health security, lack of social cohesion and the tenuous hold on security of marginalisation and oppressed groups.
Economic risk	Linked to poverty and inequality
Environmental risk	Natural resource depletion, a degraded ecosystem as a result of biodiversity loss, deforestation, reduced access to clean air and safe water

The above vulnerabilities and their drivers will entail; (Djalante et al, 2012:780; Mitchell & Turner, 2009: 28)

1. Students examining risk drivers both locally and nationally
2. Students mapping the local vulnerability landscape through participation, even leadership in community based investigative and awareness raising projects is an essential element of this dimension

Students reflect on the results of their investigation of vulnerability and hazards assessment. They use careful evaluation of all the risk drivers to find the implications of the identified hazards to the community, this in turn will help the students to appreciate the different point of views and understand the results of the evaluation. This resonates with the Reflective Observation stage of EL theory.

By identifying hazards in their community students are able to come up with mitigation measures. If they have leadership positions in the community that coordinate DRR issues, the students will value the importance of reducing the risk drivers above.

2.5.4 Dimension 4: (Building Community Risk Reduction Capacity)

The formula stated in Dimension 3 above, demonstrates that disaster risk can be reduced by increasing the capacity of a society to protect itself against hazards. From an education perspective this could entail:

1. Engaging students to share lessons learnt from school in processes of resilience building with their peers.
2. Students engage in out of school learning activities such as involving a community vulnerability mapping and assessment.
3. Bringing students and adults together to jointly engage in resilience action planning and implementation. This can be done by encouraging students to share the skills learnt in school with the community (Plan International 2010: 7; Smith, 2013:97).

This dimension resonates with the Active Experimentation Stage of EL where students approach learning objectives by influencing other people such as those in their community. By interrogating the conditions that driver up risk, there is bound to be an achievements in resilience building (Mitchell & Turner, 2009: 34)

Since dimension 3 interrogates human- caused drivers that exacerbate hazard (Smith, 2013:97). Dimension 4 then helps students to hone the skills learnt into action in the form of building community capacity. The powerful knowledge that students have acquired from the three dimensions can then be shared with the whole community in order to lower the risk.

2.5.5 Dimension 5: Building an Institutional Culture of Safety and Resilience

DRR in education has structural components such as, school buildings and facilities, non-structural elements such as policies, disaster drills and procedures (Shaw et al 2011:212). It places an emphasis on blending the structural and non-structural elements so that the school becomes a DRR learning hub oriented towards building a culture of safety and resilience for the entire community (Mitchell & Turner, 2009: 34).

This could entail:

1. Giving learners a voice in School DRR policy development;
2. Letting students manage and maintain a school and community hazard bulletin board;
3. Instituting school and community DRR council with student membership;
4. Students can engage with technical personnel from the town council on the structural safety of the school,

(ASEAN-ISDR Technical Cooperation, 2011:5; Selby & Kagawa, 2014:74)

This dimension resonates with the Abstract Conceptualization stage of EL cycle as students draw up new implication for action to include in the DRR policy. This they do by analysing their reflections and observations to create their own conclusions which will then give rise to their contribution in the DRR policy (McLeod, 2010:65).

By engaging students in the structural and non-structural component of the school DRR, they in turn can claim ownership and make sure the policy is followed to the letter.

Dimensions 1 and 2 are the most frequently used in the schools. The reason can be argued to be because some of the information is already covered in the subjects taught

in schools, which include Geography, physics and history. The diagram above indicates that dimensions 3, 4, and 5 are rarely used, which is attributed to the fact that it involves the wider community that is the local, national and global communities and the policies. If the school involves the national and global community, this may pose problems of coordinating and may overload the curriculum. It is however argued that these are equally important dimensions that give students a hands-on experience in all facets of their school's DRR education initiative and can be successful with cooperation of all stakeholders who can contribute to disaster reduction.

The implementation of the five DRR education dimensions can greatly contribute to education that is holistic, integrative, interdisciplinary (involving all subjects) and also trans-disciplinary (Selby & Kagawa, 2014:25; Mitchel & Tunner, et al 2009:63). Thus Botswana can benefit greatly from improving its DRR integration by adopting these five dimensions of DRR education. The next section aims to create a context of the current status of DRR in Botswana's primary school curriculum.

2.6 THE CURRENT STATE OF DRR INTEGRATION INTO BOTSWANA PRIMARY CURRICULUM

Botswana's national curriculum has not yet integrated DRR into the pedagogy, students assessment and teacher professional development across levels from primary to tertiary (Sinkanda & Maripe 2013:5). However, HIV/AIDS has received wide coverage in the education curriculum from primary through to informal institutions. In this regard it is argued that Botswana national curriculum has in the past successfully integrated an issue of national risk within the curriculum. However there is no clear emphasis placed on the teaching of the hazards such as floods, malaria and droughts. The wide coverage that HIV/AIDS receives is because the Botswana National Policy on HIV/AIDS 1993 under the Presidential directive CAB: 35/93 mandates Ministry of Education to integrate HIV/AIDS education into all levels and institutions of education starting at primary level, extending to tertiary level, teacher training, universities and informal institutions. This is in line with one of Botswana's Vision 2016's seven Pillars, that of an Educated and informed national populace (Statistics Botswana 2014:9).

Currently the two objectives of The National Disaster Risk Reduction Strategy 2013-2018 touch on the increasing awareness and knowledge of DRR methods and opportunities, and contributing towards the inclusion of DRR into policy, projects and programmes (NDMO, 2013:9). The policy recognises that the integration of DRR into the school curriculum may bring the skills and awareness that children need to be able to cope better in disaster situations. However due to the lack of emphasis on DRR integration into school curriculum formulation, children do not have knowledge of DRR (Sinkanda & Maripe 2013:5).

2.7 HOW BOTSWANA CAN USE THE EXPERIENTIAL LEARNING THEORY

Petal & Izadkhah (2008:102) define curriculum integration as “an approach that makes use of specially developed units, modules or chapters concentrating on DRR”. Botswana can integrate DRR in education using either vertical or horizontal integration. Horizontal integration is done across the curriculum and vertical is through the grade levels (Selby & Kagawa 2014:63). Vertical integration (figure 4 below) determines curriculum location for DRR content and curriculum progression (Bruner, 1960:13)

Curriculum progression using vertical integration is not new to Botswana as most topics, themes and concepts are infused, taught and reinforced at different stages of development through vertical integration. Learning outcomes through the academic standards are structured such that the student is enabled to handle more complex material as he/she matures. A number of activities such as role playing, drama and music are done which are synonymous with EL. Therefore vertical integration will suit DRR integration in Botswana. An example of where Botswana used vertical integration through the infusion of themes and topics into different subjects is with the concept of HIV/AIDS. The basic concepts of HIV/AIDS are infused in subjects such as Science, Social Studies and Religious and Moral Education. This is taught from primary through to tertiary varying the content as standards progress. Below is an example of vertical integration using the concept of vulnerability:

Table 4: Suggested Vertical Integration of DRR in Primary School in Botswana
(Selby & Kagawa 2014:69)

Vertical Integration of DRR into the Curriculum	
Ages 5years six months to 8 years	<p>Safe and dangerous spots at school and community;</p> <p>Dangers from flood water, road accidents, HIV/AIDS and fire;</p> <p>Basic safety habits to avoid danger;</p> <p>Visiting traffic school</p>
9 years -12 years	<p>School / community mapping on safe and dangerous spots;</p> <p>Past natural disaster impacts in the community;</p> <p>Past natural disasters impacts nationally;</p> <p>Concept of vulnerability;</p> <p>Environmental degradation and pollution;</p>

The goal of disaster related education is to change people's behaviour which then links back to the desired outcome from experiential learning (Nathe & Comerio 1999:19; Ronan et al 2001:103). When pupils of ages 5-8 are made to identify safe and dangerous spots in the school, are made to understand the dangers of flood water using ponds, and basic safety habits which may include avoiding sharp objects, climbing trees and road safety this is all learning by doing as per the EL theory.

Age 9-12 can take part in fire drills and how to evacuate buildings after a fire alarm. Students also engage in school and community mapping of safe and dangerous spots in their environment. They discuss the past and present disasters in the country such as the floods in Maun and foot and mouth in the northern regions of the country as they

threaten food security. Students are made active participants as they take part in such activities all these are experiential learning activities. Complimentary activities that engage pupils in learning by doing, experiencing and then after reflection, acting can hold promise for DRR education (Sharpe 2011:336).

2.8 EXISTING MECHANISM THAT CAN AID DRR INTEGRATION IN BOTSWANA

Disaster resilient communities rely heavily upon the success of DRR education (Petal & Izadkhah, 2008:1). As such, to ensure that DRR messages reach every home and communities informal and formal education must be integrated through schools. Children enjoy doing co-curricular activities and it is imperative that schools utilize the opportunity to emphasise on DRR education (Shaw & Yukihiro, 2014:12). Co-curricular activities will include, cultural and performing arts such as dance, music and street theatre; using posters in sharing DRR messages; projects that bring students into contact with local community and local government. These according to Shaw (2012:15) and Petal & Izadkhah (2008:1) help to develop pupils' problem solving and analytic skills; as well as generating parent and mass media interest through competition awards and commendation.

Botswana has an active teacher-parent association in nearly every school, through these fora displays of children's art work depicting risk and capacity maps can be done. An opportunity to have disaster drills such as fire drills, early warning and stimulation drill can be done during these meeting. After school clubs in the community can also aid in developing leadership and interest among children about DRR.

2.9 CONCLUSION

The above chapter addressed the effects of disasters and how integrating DRR into the curriculum can help in reducing vulnerability and resilience in children, as well nurturing a range of capabilities and skills to help students actively contribute in preparing, preventing and mitigating disasters. The chapter has shown that many countries have

benefitted from DRR curriculum integration as it often leads to the creation of a culture of safety in the broader society.

This analysis also revealed that countries apply different learning theories to facilitate DRR integration into the curriculum. Specifically EL, MI and Self Theories are employed to facilitate DRR learning, each with its inherent benefits and draw backs. However, the discussion revealed that of these three theories of learning, EL holds the most benefits to Botswana. This is because EL was found to facilitate the engagement of students in direct experience with their environment and focused reflection thereby building students' capacity on DRR.

The chapter also addressed the importance of the five dimensions of DRR learning which were found to permit the systematic treatment of DRR in the curriculum. The five dimensions were discussed and it was revealed that when students analyse the science behind the occurrence of disasters, they will be able to practice the safety measures and procedures in the event of hazard. It was also revealed that when students have a thorough understanding of the elements at work in the disaster risk formula they will be able to act in mitigating risks. By understanding the risk formula students can help increase the capacity of a community to protect itself against hazards and build a culture of safety and resilience for the entire community. The linking of the five dimensions with the corresponding stages of the EL cycle provided the theoretical benefit this has for DRR education. The marriage between EL and the five dimensions of DRR education supported through vertical integration of the themes and topics may give rise to the importance of using the two in the integration of DRR in Botswana curriculum.

CHAPTER: 3 LITERATURE REVIEW ON GLOBAL POLICIES AND STRATEGIES

3.1 INTRODUCTION

The previous chapter provided an overview of the importance of integrating DRR into school curricula, and examples of countries that have already integrated DRR in their curriculum were discussed in order to serve as best practices for Botswana. Reasons for exploring learning theories in DRR education, and the theoretical framework on disaster risk reduction education were discussed looking at three theories, (experiential learning theory, theory of Multiple Intelligence and Self Theories) that can be used in DRR learning. Reasons to why experiential learning (EL) theory is the most suitable approach for this study, the rationale for the application of EL and how EL can be reinforced using the five dimensions of DRR learning was also explored. The chapter concluded by assessing how Botswana is faring in DRR integration into its primary school curriculum as well as how Botswana can use EL to improve current integration of DRR.

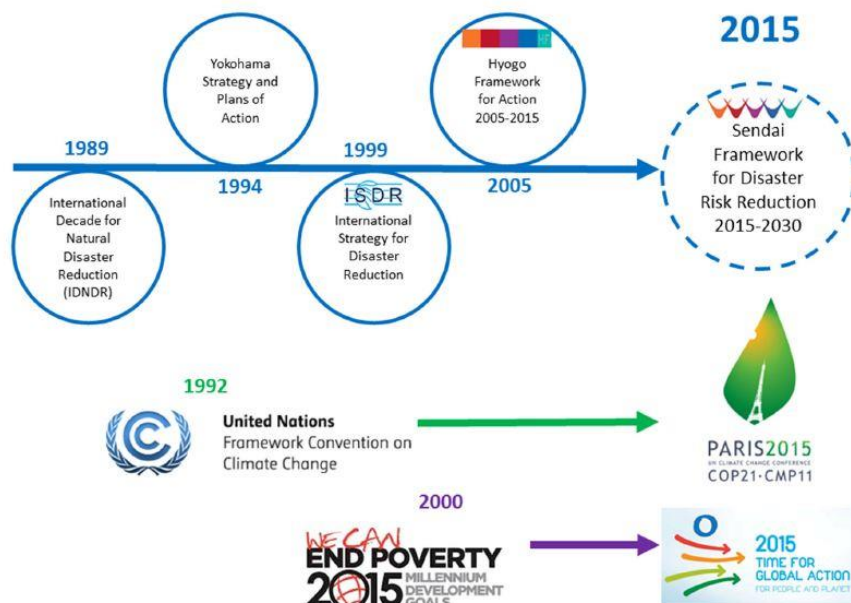
This chapter will deal with the historical development of international DRR policies and whether DRR education featured prominently in these policies. The integration of DRR education into the International Decade for Natural Disaster Reduction (IDNDR), The Yokohama Strategy and Plan of Action, the Hyogo Framework for Action (HFA), the Sendai Framework for Disaster Risk Reduction (SFDRR) and the SADC policy will be explored looking at those objectives that specifically focus on education and their implication to Botswana. Botswana's policies and strategies as well as its compliance with HFA will be explored. The present level of integration of DRR in the Botswana primary level curriculum will also be discussed.

3.2 INTEGRATION OF DRR EDUCATION INTO SPECIFIC INTERNATIONAL POLICIES

Policy development in DRR education was led by United Nations, with the recognition of "the importance of reducing the impact of natural disasters for all people and in

particular for developing countries” (Altsi, 2015:164). This recognition led to the declaration of the 1990s as the IDNDR (International Decade for Disaster Risk Reduction) in which the international community were compelled by the UN to foster international co-operation in the field of natural disaster reduction (UNISDR, 2012:2). Following the IDNDR of 1990s the International Strategy for Disaster Reduction (ISDR) was established in 2000 (Altsi, 2015:165). The second World Conference in Kobe, Hyogo Japan 2005 adopted the HFA 2005-2015. As part of its founding mandate the ISDR aimed to establish a global policy for DRR. This goal was realised by the Second World Conference on Disaster Reduction held in Kobe, Hyogo Japan Around the same time of the HFA two further global policy process were initiated in parallel to HFA process, these were the climate change agreements and Millennium Development Goals (MDGs) (Bacon, 2012:167; Ashton, 2007:3). These three policy areas are intricately related as they all draw on scientific knowledge and influence human wellbeing directly and indirectly (Kamidohzono, et al 2015; Altsi, 2015:165). The diagram below shows some of the international policies that helped to shape disaster risk reduction practice:

Figure 4: Global Policies



Source: Maskrey, ISDR 2015.

The section to follow will briefly analyse the relative contribution of key policies such as the International Decade for DRR, the Yokohama Strategy and Plan of Action, the HFA 2005-2015, SADC policy on DRR and the Sendai Framework for DRR 2015-2030 in promoting the integration of DRR into education curriculum. This allows the researcher to gain a deeper understanding of the original rationale behind integrating DRR into curriculums and what would constitute integration as per global policy. The International Decade for Disaster Risk Reduction will serve as a point of departure for this discussion.

3.2.1 The International Decade for Disaster Reduction

The aim of the IDNDR was to reduce through concerted international action, especially in developing countries, loss of life, poverty, social and economic disruption caused by natural disasters (IDNDR, 1989:161). One of the objectives closely related to education, that was put out to be achieved was *“To develop measures for the assessment, prediction, prevention and mitigation of natural disasters through programs of technical assistance and technology transfer, demonstration projects and education and training, tailored to specific disasters and locations and evaluate the effectiveness of those programs”* (IDNDR, 1999:33). The IDNDR also elaborated on policy measure that were to be taken at national level relating to education by encouraging countries *“To enhance community preparedness through education training and other means”* (IDNDR, 1989:162). Additionally, the IDNDR Programme Forum of 1999 addressed major concerns in disaster risk management related to education which led the Forum in advocating for the successor to IDNDR to integrate education for disaster reduction in programs of the successor arrangement to IDNDR and foster regional, nationally and internationally cooperation, exchanges of resources and good practice (IDNDR, 1999:33).

From these examples it is clear that the importance of integrating DRR into education, and using it as a tool to reduce disaster risk has been part of international disaster management policy theory since its genesis. However, there were some shortcomings in

practical policy formulation for DRR/education integration. An example of this is the Yokohama Strategy and Plan of Action for a Safer World.

3.2.2 The Yokohama Strategy and Plan of Action

One of the main outcomes of the IDNDR was the Yokohama Strategy for a Safer World and its Plan of Action, adopted in 1994 at the World Conference on Natural Disaster Reduction held in Yokohama, Japan (UNISDR, 2007:1). Guidelines for action on prevention, preparedness and mitigation of disasters were set by the Yokohama Strategy (Shaw & Oikawa, 2014:23). The guidelines were based on a set of ten principles that stressed the importance of risk assessment, disaster prevention and preparedness, the capacity to prevent, reduce and mitigate disasters, and early warning (UNISDR, 2007:1; WCDRR, 1994:1).

Among the ten principles of the Yokohama Strategy and Plan of Action, there is not a single principle that placed an emphasis on DRR integration into curriculum. The only principle that mentions something close to education is principle 5 that advocates for 'the information, knowledge and some of the technology necessary to reduce effects of natural disaster to be available at low cost and applied' (WCDRR, 1994:2). The implications of not emphasising on DRR integration into the curriculum meant that children were left out in measures that teach them better preparedness and increased capacity and knowledge regarding what to do in an emergency as well as how to identify and respond to risks in their communities (Wisner, 2006:23; Barakat et al, 2010:21). This is evident with the 2005 earthquake in Pakistan where more than 16,000 children died in schools that collapsed, with 175 million children worldwide likely to be affected yearly by disaster alone (UNISDR, 2006:1; Venton & Venton, 2012:5). Although the IDNDR recognised in theory that DRR/education should be integrated, the document that should have given life to this theory missed the mark in realising it. This meant that member states did not have any reason to prioritise DRR/education integration – meaning that progress to safe schools environment, disaster aware learners and communities characterised by culture of safety was somewhat stifled.

The IDNDR Programme Forum of 1999 identified that the major concerns of the integration of disaster risk management related into education had not occurred during the decade (Sassa et al 1996:500). Hence it was advocated at the Programme Forum that education for disaster reduction must be integrated in programme and policies of the successor arrangement to the IDNDR (IDNDR, 1999:33). The successor to IDNDR was the UNISDR who was responsible for the formulation of the pre-eminent global policy on DRR, the Hyogo Framework of Action 2005.2015.

3.2.3 The Hyogo Framework of Action 2005 - 2015

The Hyogo Framework of Action (HFA) 2005-2015 was adopted in 2005 by 168 member states, to build resilient nations and communities through substantial reduction in disaster losses by 2015 (UNISDR 2011:2; SADC, 2013:3). It was the primary global framework for DRR to give critical guidance to all nations in their efforts to reduce risk. As such 5 key indicators were formulated to guide nations towards a more disaster resilient society. These included:

1. Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

Integration of DRR into education curriculum was guided by Priority 3 which called upon different stakeholders including jurisdictions and communities to, “use knowledge, innovation and education to build a culture of safety and resilience at all levels” (UNISDR 2007:8; GFDRR, 2010:10). This was to be implemented by integration of DRR knowledge in relevant sections of school curriculum, including local risk assessment and disaster preparedness programs in schools and institutions of higher learning, and implementing programs and activities in schools, that teach learners how to minimize the effects of hazards (Field, 2012:509; Tran, 2009:25).

The mid-term HFA review 2009-2011 made some findings which included that, the idea of integrating DRR in the school curriculum was pursued with great enthusiasm in the past decade, however, there was very little evidence in literature to suggest that it was done within the framework of strategic educational planning at national level (UNISDR, 2011:26). Very little progress in the field of education for DRR was made in the first year of HFA and evidence on the ground did not show much towards the promotion of inclusion of DRR knowledge in relevant sections of school curriculum at all levels by 2015 (UNISDR, 2011:26; Murray, 2011:45; Holmes, 2009:12). Much of the shortcomings in achieving the goals of integrating DRR into the education was attributed to the complexity of integrating new material like DRR into the curriculum as it requires a systematic approach, sustained action and a strong political will from the governments. These were found to be lacking in many countries and regions (Carby, 2011:39; Bodenhamer, 2011:15). For instance in Southern Africa, a number of initiatives were started but several countries indicated that the integration of DRR into school curriculum must be donor driven and not fully owned by governments (Roberts, 2012:521; Field, 2012:510),

A list of countries that indicated a 'YES' or 'NO' as answer to the question "Is DRR included in the national education curriculum?" as reported in the 2009-2011 HFA Progress Report are listed below (UNISDR, 2014:89-91; Preventive web, 2011). The table aims to show that there are very few countries that have implemented measures to integrate DRR into school curriculum near the end of the HFA period.

Table 5: Progress Report 2009-2011, Priority 3 indicator 2 for selected countries

Country	Indicator
Bangladesh	Yes
India	No
Georgia	Yes
Japan	Yes
Thailand	No
Algeria	Yes

Botswana	No
Comoros	Yes
Kenya	No
Senegal	No
Brazil	No
Chile	Yes
Jamaica	Yes
Norway	Yes
Switzerland	No
Finland	Yes
Bulgaria	Yes
Colombia	No

There is very slow progress in integrating DRR and education in the SADC region. This shows that the member states do not adhere to the global and regional policies that govern DRR education integration. For a region that experiences huge losses of lives and destruction to property whenever disaster strikes, it is imperative that the member states adhere to policies that empower the young generation in minimizing the effects of hazards. The HFA has been replaced by the Sendai Framework for Action (SFDRR) 2015-2030.

3.2.4 The Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction (SFDRR 2015-2030) was developed in consultation with several, regional, national and inter-governmental agencies as well as working with UN agencies and scientists to develop targets and indicators for SRDRR (Altsi, 2015:165). The SRDRR was born from the need to ensure DRR policy reflects the complexity of disaster reduction in the 21st century (Kamidohzono, et al 2015:63; Altsi, 2015:165). The SFDRR is a policy framework that represents a step in the direction of global policy coherence with reference to development and disaster risk reduction (UNISDR, 2015:7). The aim for SFDRR for the

next 15 years is “The substantial reduction of disaster risks and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries”. This will be achieved through the implementation of the following four priorities of action (UNISDR, 2015:7):

1. Understanding disaster risk;
2. Strengthening disaster risk governance;
3. Investing in disaster risk reduction for resilience;
4. Enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery, rehabilitation and reconstruction;

The first priority for action for the Sendai Framework supports DRR education and knowledge as it propagates “Understanding disaster risk” (UNISDR 2015:4). To achieve this, there are activities that have to be followed which include:

1. Emphasis on building knowledge at all levels of society through sharing experiences, lessons learned, good practice and training and education on DRR, including;
2. The use of existing training and education mechanisms and peer learning and promoting the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and non-formal education;
3. Promotion in civic education at all levels, as well as in professional education and training (UNISDR, 2015:11);

The above activities show that DRR education is being taken seriously at the international level. This means all countries that are signatories to the SFDRR, including Botswana, will have to comply.

The SFDDR is building on the HFA and as such regional bodies such as Regional Platform for Asia, Regional Platform for Arab States and Regional Platform for Africa guide the governments in improving coordination and implementation of SFDRR activities. The Southern Africa perspective on DRR will be pursued through draft SADC

Strategy for DRR which Botswana is a signatory, in order to explore where the region stands in supporting the global efforts, this will guide the position taken by Botswana.

3.2.5 The SADC Policy and Status on DRR Education

The Southern Africa regional body, also known as Southern Africa Development Community (SADC), faces combined dangers of HIV/AIDS, weak economy and climate extremes which have led to increasing vulnerability of its population and fragility in the region (USAID/OFDA, 2012:6; Dingo & Tiwari, 2010:3). This also is exacerbated by minimal coping capacities as most Southern Africa countries have inadequate social protection policies to provide safety nets for the poor. The fragile economies of the countries in the region make it difficult for the countries to invest in DRR measures (Vyas-Doorgapersad & Lukamba, 2012:780; Dingo & Tiwari, 2010:3). Out of 15 countries in the SADC region, nine fall in the low Human Development Index (HDI), with Lesotho, Zambia and Malawi, Zimbabwe and DRC falling below the sub Saharan Africa HDI of 0.475 (Makuna, 2015:45; UNAIDS, 2013:25).

Regardless of the challenges above, the SADC region recognises that, 'disasters are a development problem' integrating DRR in development processes, that include education, is likely to contribute to the resilience of the SADC region to disasters (SADC, 2012: 7). However the region is formulated only limited policy and institutional frameworks for building capacity and disaster resilience (SADC, 2014:8). These limited policies and institutional frameworks have been augmented by additional problems such as irregular and inconsistency self-reporting by the member countries on HFA implementation especially priority 3 and limited DRR technical or institutional capacity on how to monitor adherence to HFA priorities (SADC, 2013:33; GFDRR & WB, 2010:34).

The 2013 Report assessing the extent to which DRR has been integrated and implemented in SADC region made the following finding (SADC, 2013:8)

1. Hazards trends are on the increase
2. Vulnerability to disasters are on the increase

3. Limited sustainability of resilience and capacity development efforts
4. Low, irregular and inconsistent self-reporting on HFA implementation
5. Progress on DRR integration but inadequate resource

The Mid-Term Review (2010) and the Global assessment report (2011) highlighted the limited progress in using knowledge, innovation and education to build a culture of resilience (SADC, 2013:3; Vyas-Doorgapersad & Lukamba, 2012:781). The fifteen SADC countries below show the level of integration in Education (GFDRR & WB, 2010:48; HFA MIDTERM Review 2009-2011).

TABLE 6: 15 SADC Countries Level of DRR Education Integration.

COUNTRY	ASSESSMENT
Namibia	Has not included DRR in the national curriculum. The Education Plan 2002-2015 is silent on DRR.
Zambia	Education Medium Term Plan does not have explicit DRR components.
South Africa	Assessment was not carried out due to difficulties with accessing sector policies
Tanzania	Has not included DRR in the national education curriculum.
Mozambique	Does have explicit DRR components in the curriculum, however, there is no systematic policy and institutional commitment.
Mauritius	Has attained institutional commitment and does include DRR in education but these achievements are neither comprehensive nor substantial.
Malawi	Institutional commitment has been achieved with aspects of DRR included in the primary school curriculum.
Lesotho	Institutional commitments have been attained but the achievements are not substantial. DRR integration into school curriculum for basic education is in progress though it

	is slow because of lack of expertise and financial resources.
Swaziland	Assessment was not carried out due to difficulties with accessing sector policies
Botswana	Some progress has been achieved but without systematic policy and institutional commitment. There is lack of sufficient capacity and resources at NDMO.
Angola	No assessment for both the HFA midterm progress report and for the Global Assessment Report and there was no reason given.
DRC	Assessment was not carried out due to difficulties with accessing sector policies.
Seychelles	Has not integrated DRR into education curriculum.
Madagascar	Substantial achievements have been attained in DRR integration into education curriculum, but there are limited key aspects such as financial resources and operational capacities.

Due to the risk aspect of SADC countries, it is imperative that DRR integration into school curriculum be made priority in policies and strategies of member countries. If the mother body, which is SADC, priorities and gives attention to DRR curriculum integration, then member countries will be compelled to adhere to those policies. Botswana as a member state of SADC has to follow the guidelines for DRR curriculum integration set by the SADC.

3.2.6 Policies and strategies that govern DRR in Botswana

The Botswana National Disaster Management Policy was established in 1996 through the president directive 27/96 (BNDMP, 1996:3). This was followed by the establishment of the National Disaster Risk Management Plan (NDRMP) in 2009, which was to provide a framework to implement DRR and emergency management involving all the sectors and institutions and for achieving the goals of sustainable development through ensuring

DRR implementation in the country (UNDP & NDMO 2009:4). The NDRMP also provides a framework which guides all sectors and stakeholders in preparing their DRR and Emergency Management Plans (BNDMP, 1996:5). The plan goes beyond the disaster management policy as it adopts a multi-sectorial and multi-level approach for disaster risk assessment and responses in line with HFA (UNDP & NDMO 2009:4). At regional level the NDRMP is guided by Africa Regional Strategy for DRR and the SADC Strategy for DRR (NEPAD, 2004:15).

The National Disaster Risk Reduction Strategy 2013-2018 is the first strategy that Botswana has come up with and aims to use it to guide and act as a framework for DRR implementation in the country (UNDP & NDMO, 2013:1). The strategy promotes the awareness of disaster risk reduction at schools and communities known to be at risk in line with the HFA priority 3 (UNDP & NDMO 2013:22). It is important to look at how Botswana has fared in its compliance with priority 3 especially indicator 2 which promotes the inclusion of DRR knowledge in relevant sections of school curriculum at all levels (UNISDR, 2005:9).

3.3 BOTSWANA DRR EDUCATION'S COMPLIANCE WITH HFA

Botswana is ranked as an upper middle income country by the final progress report 2014 meaning it is one of the countries that could manage to address some of the challenges brought about by disasters (UNISDR, 2014:12). The four progress reports for HFA were 2007-2009, 2009-2011, 2011- 2013 and the final progress report 2013-2014 (UNISDR, 2005:13). From these reports it is clear that DRR education is a fairly new concept to Botswana and a lot needs to be done in institutionalising the DRR integration process (UNISDR & AU, 2013:90). This could be the reason why two out of four HFA cycle reports were submitted by Botswana, namely the 2009-2011 and 2013-2015 reports (UNISDR, 2014:8).

Botswana had a ranking of zero (0) in the first progress report 2007-2009. Meaning the country did not submit the first progress report which could have shown how it is progressing in the implementation of the five priorities of action, especially in relation to

the priority 3 (Use knowledge, innovation and education to build a culture of safety and resilience at all levels) as set by the HFA. No reason was given for non-submission.

In the second progress report 2009-2011, Botswana's ranking was at one (1), which meant the country submitted its progress report. The report indicated the level of achievement to be two (2) and that some progress has been achieved but without systematic policy and or institutional commitment (Prevention web, 2011:6). This was in reference to the module offered by University of Botswana's social work department. However, DRR is not included in the primary school curriculum and this was attributed to lack of sufficient capacity and resources at National Disaster Management Office (Prevention Web, 2011:6).

The third progress report was for period 2011-2013 but Botswana did not submit any record. Botswana then submitted the final report 2013-2015. The final report on the implementation of HFA 2013-2015 was submitted and the level of progress achieved for Priority 3-Core Indicator 2 was 2 (NDMO,2015:14). The evaluation of the indicator was guided by a key question, "Is DRR included in the national education curriculum?" for Botswana this was a 'NO' (NDMO, 2015:14). Although DRR is new to Botswana and has not received much attention, DRR education integration can learn a lot from the country's experience on integrating another key development and health issue such as HIV/AIDS.

3.4 CONCLUSION

There is now increased international recognition of DRR integration into primary school curriculum, judging by the numbers of DRR policies, strategies and frameworks that have been produced. These include the IDNDR which had a theoretical commitment to DRR education integration but in practice this only started to be taken seriously in 2005. It can be argued that the fifteen year (1990-2005) delayed implementation of DRR education integration gave rise to the huge loss of lives and destruction to property prior to 2005. These policies culminated to the HFA 2005-2015 which advocated for the integration of DRR into education through its priority 3 indicator 2. However a number of countries did not practically implement the HFA and for southern African countries this

was attributed as indicated earlier, to limited DRR technical and institutional capacity of monitoring adherence to HFA priorities. The HFA gave rise to countries coming up with strategies that are guided by its five priorities. The most important priority for DRR integration into education being Priority 3 indicator 2, “to use knowledge, innovation and education to build a culture of safety at all levels by integrating DRR into the primary school curriculum.

To date, a number of continents have developed their own continental strategies. AU, a body that represents all African countries came up with the Africa Strategy for DRR, this guided the regional members like SADC in coming up with strategies for their member states. Botswana is a member of SADC and is guided by the draft SADC Strategy for DRR.

DRR education is a new concept in Botswana as such it has not been fully embraced. The National Disaster Risk Reduction Strategy 2013-2018 also includes an initiative in one of its strategic goals which calls for integration of DRR into the school curriculum. Although in its progress report on the implementation of HFA 2013-2015, Botswana indicated that DRR is not included in the primary school curriculum, some of the topics that deal with disasters are found in individual subjects like, Science, Social Studies and Agriculture. It can be argued that Botswana subtly integrates DRR into the primary school curriculum but lacks emphasis on mitigation, preparedness and prevention. The government of Botswana could learn a lot about explicitly integrating DRR issues into primary school curriculum from its previous success in integrating HIV/AIDS throughout the range of education curricula (primary, secondary and tertiary education) in the country.

CHAPTER 4: METHODOLOGY AND DATA COLLECTION METHODS

4.1 INTRODUCTION

The previous chapters have focused on the theoretical framework that guide the integration of DRR into the primary school curriculum and how EL can be used in integrating DRR into Botswana primary education curriculum. The policies, strategies and framework that guide the DRR education were also explored and how Botswana has managed to draw lessons from these policies and strategies to inform the development of its own.

The following chapter will focus on the research design used to explore the topic under study as well as processes used for data collection. The mixed method research approach which is a combination of qualitative and quantitative approach was explored in this chapter. The rational of using the mixed method in this research is expounded by including benefits of the method in achieving the research goals of the study.

Triangulation is also defined in this chapter and its importance in this research. Specifically, different types of triangulation method and the reasons for choosing methodological triangulation will be explored. The four data collection tools employed in this study namely, secondary data collection, structured questionnaire, semi-structured questionnaires, and observation are elaborated on.

The reliability and validity of the research study will be explored. The validity part of the research will be explored as it measures the truthfulness of the results. The reliability of the results will be measured through the two methods used which are quantitative and qualitative methods.

The chapter will also elaborate on challenges that were encountered in the course of data collections such as the issuance of research permits where three permits were needed before the researcher commenced with data collection. The scientific limitation of the research will be expounded on. The chapter will close with the ethical considerations that were taken into account in the roll out of the research project.

4.2 RESEARCH DESIGN

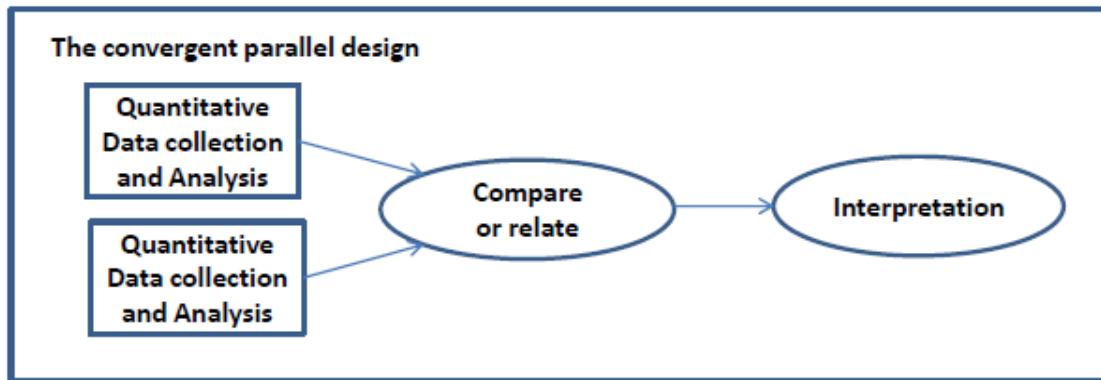
A research design is defined as the logic that links the data to be collected and the conclusion to be drawn to the initial questions of the study (Henning, 2004:56; Creswell, 2003:15). The selection of methods of data collection and analysis tools are of up most importance in ensuring research results that are accurate. It therefore becomes crucial to outline the research design selected for the specific study. Specifically, this research followed a mixed method research approach which is a combination of qualitative and quantitative research approach. This research design is described in more detail in the section that follows.

4.2.1 Mixed Method

Mixed method research as defined by Du Plessis et al (2010:456) is a method that involves qualitative and quantitative research methods being mixed in more than one stage of the study. Bless et al, (2013:16) concurs that mixed method is an approach that uses both quantitative and qualitative approaches in the same study in order to confirm or elaborate on each other. For instance this research used structured questionnaires which are quantitative in nature and observation which is qualitative in nature. The rationale for mixed method paradigms in research interventions (including this research study) is that the strength of one method overcomes the weakness of the other (Greene & Caracelli 1997:10; Creswell, 2003:13). Reinhardt and Cook emphasised this complementarity in the following quote “there is no reason for researchers to be constrained to either one of the traditional paradigms when they can have the best from both” (Johnson et al 2007:116). In this study the quantitative aspect of the research allowed the researcher to use Likert scale questions which involved a series of statements that the respondents choose from in order to rate their responses to evaluate questions (Vogt, 1999:336; Teddlie et al., 2007:99). This was supplemented with qualitative open ended questions which allowed participants to describe their own experiences of the subject in more details while providing the reasoning behind the numbers that came out from the Likert scale.

The mixed method design that was used in this study applied a convergent parallel design as depicted in figure 10 below. This means that the quantitative and qualitative approaches were implemented concurrently during the same phases of the research process (Bless et al., 2013:238; Creswell & Clark, 2011:69).

4.2.1.1 Figure 5 Convergent parallel design



An additional benefit of employing mixed method within the research context was that the researcher could include the use of broader and more complete range of research questions. This was due to the fact that the researcher was not confined to a single approach of asking research questions (Du Plessis et al., 2010:459; Creswell, 2003:20). The mixed method therefore allowed for a more depth understanding of the current state of DRR integration into school curriculum in Botswana. The use of qualitative and quantitative research methods (mixed method) also allowed for methodological triangulation to be used (Bryman, 2008:315; Creswell, 2003:12). Triangulation is the combination of different research methodologies to study the same phenomenon (Johnson et al., 2007:124; Bless et al., 2013:238). Through triangulation the researcher seeks convergence, collaboration and correspondence of data from the different methods (Creswell & Clark, 2011:62). There are four types of triangulation methods, which are, data triangulation, investigator triangulation, theory triangulation and methodological triangulation (Denzel 1978; 14). This research used methodological triangulation which required the use of different data collection methods. As indicated earlier, this research used structured questionnaires which are quantitative in nature and

observation which is qualitative in nature. The different data collection methods that were used in gathering data are expounded below.

4.3 DATA COLLECTION METHODS

A number of methods were employed in gathering the data for this research. The different methods included secondary data collection, structured questionnaires, semi structured questionnaires, and observation.

4.3.1 Secondary data collection

De Vos et al., (2004:314) refers to secondary data collection as an analysis of any written material that contains information about the phenomenon that is being researched. The definition is supported by Bless et al (2012:395) who argued that secondary data is data used in a specific study collected by a different researcher to address a different research problem. This data can be summaries of numbers, raw data that is already collected and treaties which can be thesis or articles.

The researcher collected secondary data from documentation centres such as Bocodol Library in Botswana and the University of Botswana Library where academic articles such as books were accessed. The internet provided an additional source of secondary data in the form of development agencies websites relating to DRR education and curriculum integration such as UNISDR. Policies and reports were also downloaded from the global agencies websites. These reports contained information from countries that serve as good examples in DRR education curriculum integration which were used (see section 2.2). This helped to establish best practice examples with which the level of integration in Botswana (the area under study) could be compared. Relevant reports from the media were also used and this was useful in order to get what the general society thinks in terms of disasters and education integration. Information from journals, policies and researches from development agencies helped to give an understanding of the level of DRR curriculum integration globally, the achievements and the challenges faced.

Structured questions from quantitative method and semi structured questions from qualitative method were also selected to collect data for the study.

4.3.2 Data Collection tool: Structured questions

Structured questionnaires use closed/prompted questions with predefined answers (Harris & Brown 2010:55; Bryman, 2012:246). Structured questions were presented with a set of fixed alternatives from which respondents had to choose the answer (Creswell & Clark, 2011:176; Bryman, 2012:246). Questions were asked to the respondents in the same way and sequence. One of the advantages of using structured questions is that the availability of answers might help those who might not be clear about what the question requires (Behr, 1983:152).

The structured questionnaires were used for quantitative data collection. Possible responses were supplied in advance and the respondents indicated their choices which were rated on Likert Scale (Kendall, 2008:45). Seventeen (17) closed questionnaires were administered to the educators. Respondents were putting a tick on the suitable answer (see Appendix 6.1 for structured questionnaires).

4.3.3 Data Collection tool: Semi Structured Questionnaires

A semi structured questionnaire technique uses questions that moulds the respondent's frame of reference, while at the same time giving the respondent the freedom to respond in whatever way she/he likes (Jarbandhan & Schutte, 2006:678; Auriacomb, 2010:477). The researcher used semi structured questionnaires with key people drawn from schools, curriculum development unit and department of disaster management. This helped in getting more information about the problem under study. By using the semi structured questionnaires the researcher also obtained comparative information pertaining to the level of disaster risk reduction integration into curriculum. This type of data collection was used because it gave room for exploration on the topic as the

respondents gave more information on the topic than that which was asked for, thereby satisfying the qualitative approach of data collection.

4.3.4 Key Informant Interviews

Key informant interviews were held with Curriculum Development Unit and Disaster Management Office parties. The researcher used a flexible interview guide that helped in following up on issues raised by respondents that were of particular interest to the research. By using semi structured questions for the interviews this gave a complete representation of the participants' views and accounts of disaster risk reduction integration into the Botswana curriculum. They were able to explain their views on the issue at hand (Greeff, 2005:296). 12 questions were compiled beforehand for Curriculum department and nine questions for disaster management office, this formed the vital part of this study. The difference in the quantity of questions for curriculum department and disaster management were informed by the amount of information that could realistically be provided by each department. There was a need to dig deeper into what informs the Botswana curriculum in order to understand the narrative behind DRR curriculum integration. It was to the discretion of the interviewer to adjust or depart from the set questions as well as changing the order of questioning as the situation demanded (Behr, 1983:152). The evidence gathered from the semi structured questions provided awareness into the level of DRR curriculum integration in Botswana. The respondents consented to the use of a voice recorder to document the interviews. (See Appendix 6.2 for interview guide)

By using the structured and semi-structured questionnaires it was possible to get responses that were unique to each respondent. Observation was an additional data collection method selected to compliment the questionnaires administered during the research process.

4.3.5 Population and Sampling

A sample is a unit within a larger population that a researcher selects to form the key focus of his/her inquiry (Bryman, 2012:187; Bless, 2006:99). Besides the elements being people, they can also be towns, animals and organisations that are selected for investigation, where testing every single unit is impossible (Bryman, 2012:187). This research used purposeful sampling which is defined as selecting units based on specific purposes associated with answering a research study question (Teddle & Yu, 2007:54; Maxwell, 1997:22). The units were deliberately selected because of the information they were to provide. To this end Educators, Curriculum Developers and Disaster Management Office formed the sample frame as they are familiar with the curriculum and the requirements of the Sendai Framework for DRR as it pertains to integrating DRR into the curriculum.

The sample combined 30 educators from six primary schools. The primary schools were four government primary schools that follow the government syllabus which provided 12 educators, three from each school. What informed the selection of the four government schools is the location. One school was selected from each region in Gaborone. The regions were Gaborone Central Region, Gaborone North East Region, Gaborone South Region and Gaborone South East Region. This was done to gain an insight on the prevalence of DRR education in the greater Gaborone area. Two private schools that follow the government syllabus but teach beyond the syllabus were also selected and provided three respondents from each school. This was done to give an insight on whether what they teach beyond the syllabus includes the integration of DRR. Two private schools that offer a curriculum driven by the International Baccalaureate Organisation Curriculum Framework called the Primary Years Programme (PYP) were chosen because they are also guided by the Botswana curriculum. This was chosen to check whether in PYP curriculum framework DRR is included. The last two were private schools that follow the Cambridge syllabus, some students from these two schools write the Botswana Primary Leaving Exam at Standard 7 which follows the government curriculum while the other students write Cambridge exam at standard 6.

One link person from the curriculum unit who deals with DRR education and one person from the National Disaster Management office who deals with education and awareness raising were interviewed. It was not possible to have more than one participant from these two departments as there is only one person responsible for DRR from each department.

The researcher also used snowball sampling to select the respondents for the study. Snowball sampling is when a researcher makes initial contact with a small group of people who are relevant to the research topic and then uses them to establish contact with other individuals that might be relevant to the research (Bryman, 2012:202). This sampling method was selected because not all disaster management link persons were known to the researcher when the research commenced. The researcher made the initial contact with one educator who then recommended other schools that could give relevant information pertaining to the area under study. Snowball sampling could not work with the Curriculum Development Unit and Disaster Management Office as the concept is fairly new in Botswana and the two people interviewed were better placed for that role.

Data collected from the data collection tools explored above was analysed using qualitative and quantitative approaches. These two methods will be discussed below.

4.4 DATA ANALYSIS

Data analysis is a process of systematically applying statistical or logical techniques to describe, illustrate, condense and evaluate data (Henning, 2004:100; Behr, 1983:151). Data analysis aims at making sense of text and image data (Creswell, 2003:190). The methods used for data analysis in this research are qualitative and quantitative data analysis methods. The main purpose of using the two data analysis methods is that qualitative data describes a situation which helps in gaining insight to a particular problem and quantitative data analysis measures the magnitude of a problem such as how widespread the practice is (Harris & Brown, 2010:61). While the quantitative method quantified data from structured questionnaires in numerical form for presentation

on graphs and tables the Qualitative method explained and interpreted the information given by educators when they responded to semi structured questions.

4.4.1 Qualitative data analysis

The qualitative method of data analysis is seen as a process of working with data, categorising the data, breaking it down into practicable units and illuminating key findings (Henning, 2004:101; Greene & Caracelli, 1997:10). The main interest in qualitative method of data analysis is the explanation, interpretation of the living experience of the respondents.

For the purposes of this research, narrative analysis was used which is the transcription of experiences and interviews (Teddle & Yu, 2007:71). Through the narrative analysis the researcher had to sort and reflect on the data, enhance and present it in a revised shape to the reader. Coding, which is the process of attaching labels to lines of texts so that the researcher can group and compare similar or related pieces of information was used (Bless, 2006:102; Greene & Caracelli, 1997:10).

4.4.2 Quantitative Data Analysis

Quantitative data analysis involves a technique by which researchers convert data to numerical forms and subject it to statistical analysis (Greeff, 2005:201; De Vos et al, 2004:314). In this research coding and quantification was used where data was converted into numerical form for easy data entry. The Likert scale was reduced from 5 categories to 3 categories according to the categories in the questionnaires which were three choices, Yes, No and Not Sure. The use of a 3 point Likert scale was adequate as the answer to the rating was followed up by a semi-structured questionnaires that required the respondent to explain him/herself.

Distribution of data was managed through the use of the frequency distribution table. The frequency distribution was used to count the number of responses to a question (Kendall, 2008:45; Auriacomb, 2010:478). The researcher evaluated the data for completeness and consistence, for instance a respondent may have chosen not to

respond to a question on age but answers it in another question (Harris & Brown, 2010:78).

4.5 RELIABILITY AND VALIDITY

A research study must be trustworthy, of good quality and the data collected must be reliable and valid. Bryman (2012:171) defines validity as the issue of whether an indicator or indicators that are devised to gauge a concept really measure that concept. This is supported by (Greeff, 2005:296; De Vos et al., 2005:251) who view validity as a means of determining whether the research truly measures that which it was envisioned to measure and the results of the research must be truthful. To achieve this, the researcher used the method of triangulation of data where a variety of data resources were used in the study (Patton, 1985:187). Data triangulation is referred to as the use of a variety of data resources in a study such as open ended questions, semi structured questionnaires and closed questions (Greene & Caracelli, 1997:14). The research instruments, (observation, questionnaires and interviews) that was chosen by the researcher facilitated the achievement of the research objective and led to greater validity.

Reliability is referred to as the consistency of a measure of a concept (Bryman, 2012:169) and Henning (2004:151) further expands the definition of reliability as the extent to which results are consistent over time as an accurate representation of the cases selected for the study. This means if someone is to replicate the research in similar conditions the result comes out the same. This will then prove that the research instrument used is reliable. The quality of quantitative method of data analysis is assessed through its reliability, validity and objectivity whereas that of qualitative method of data analysis is evaluated through its trustworthiness (Bless et al., 2013:221). As this research uses qualitative and quantitative research methods, the quality will be evaluated in terms of the two different methods (Patton, 1985:188). By engaging educators from different settings such as government school educators and private school educators who follow the government syllabus, this gave a truthful position of DRR education in a variety of education institutions in Botswana.

A number of challenges were met in the process of coming up with data that is credible and worthwhile. The challenges are expounded on in the next paragraphs.

4.6 LIMITATIONS ENCOUNTERED

A research intervention is bound to encounter challenges that could affect the collection and analysis of data. Some of the limitations that the researcher encountered will be explored below.

4.6.1 Research permit

The researcher, being a foreigner in Botswana needed research permits from various government departments in order to be allowed access to all places related to the topic under study. The researcher was not aware that the permit that was issued by the Office of President (under which the department of disaster management falls) was on its own not sufficient. It was only after two months when the researcher needed to have access to schools that there was then a need for a permit from Ministry of Education and Regional Office of Education. This delayed the process of data collection by two months.

4.6.2 The scientific limits of the study

The results of this study cannot be generalised to all countries as the study only focuses on Botswana. However, some of the general lessons on what to take into account in curriculum development such as the pedagogy, vertical and horizontal integration and the five dimensions of learning might be adopted by other countries in the SADC region

4.7 ETHICAL CONSIDERATIONS

Ethics are defined as a set of widely accepted moral principles that offer rules for, and behavioural expectations of the most correct conduct, experimental subjects and respondents, sponsors, other research and students (De Vos et al., 2005:350). Participants in the research were treated with respect. The information regarding the

purpose of the research was availed to the participants so that they were fully aware of the significance of their contributions.

Confidentiality was guaranteed and was sought first before engaging them in the research interviews. There was no coercion of participants in the research, their participation was voluntary. Prospective research participants were given as much information as possible to enable them to make an informed decision about whether or not they could participate in the study. The researcher avoided the intentional misinterpretation of data gathered as it is a violation of ethical research principles.

4.8 CONCLUSION

The chapter addressed issues pertaining to the research design adopted. The mixed method research design was utilised to ensure that the data collected is adequate to be representative of both the study and area under study. The mixed method research was selected by the researcher as the most appropriate design as it provided the researcher with the complimentary benefits of using both qualitative and quantitative research tools. The quantitative aspect of the mixed method research used the Likert scale. The Likert scale used a 3 point scale involving a series of statements from which the respondents chose the best answer that suited them. The qualitative aspect supplemented the Likert scale by involving open ended questions that allowed the respondents to explain their experiences fully.

A number of data collection tools were employed and they included structured questionnaires that used the closed questions. These questionnaires were rated on the Likert scale. The semi structured interview questionnaires were applied during interviews with Curriculum Department and Disaster Management Office as well as on questionnaires with educators. The information gathered using the semi structured questionnaires gave comprehensive information on the status of DRR in the Botswana curriculum.

Purposeful sampling was used to select the participants who could help in answering the research question. Respondents selected came from the schools, curriculum

development unit and disaster management department. Snowball sampling was also utilised to gain access to additional participants who could provide relevant information pertaining to the area under study.

The method of triangulation of data was used in the study and this led to greater validity. The engagement of educators from different primary schools in answering questions on the Botswana curriculum gave a truthful position of DRR in the curriculum without any bias.

A number of challenges were encountered by the researcher during the collection of data. These include the scientific limits of the study which showed that the research results cannot be generalised to all countries as it focused on Botswana. The issuance of research permits was problematic as there were different departments involved in the research, which is Ministry of Education and Department of Disaster Management. The following chapter will present and analyse the data for the study.

CHAPTER 5: FINDINGS

5.0 INTRODUCTION

The preceding chapter focused on the methodology and data collection methods that were used in the study. The key data collection instruments that were used were semi-structured questionnaires, open ended questions, structured questions and Interviews. These data collection instruments were used with the educators from the ten schools in the greater Gaborone area and the two key informants from the Disaster Management Office and Curriculum Development Unit.

The ten schools included two primary schools that follow the International Baccalaureate approach, two primary schools that follow the Cambridge syllabus, two primary schools that follow the government syllabus but teach beyond the syllabus, and four government primary schools that follow specifically the government syllabus. The four government schools came from the education clusters in the greater Gaborone area namely north, central, east and west. From these ten schools a total number of 30 respondents participated in the data collection exercise. Data was also collected from the two interviews with the Botswana Disaster Management Office and Curriculum Development Unit.

This chapter presents the data and data analysis on the integration of DRR into the Botswana education curriculum. The results from the field study presented in this section were collected between August 2015 and December 2015. The data presented in this chapter was analysed and interpreted using both qualitative and quantitative methods, thereby utilising the mixed method approach as discussed in chapter 4.

The data is presented in two sections, the data gathered from educators and secondly, information gathered from the two interviews with the Botswana disaster management office and curriculum development unit. The research questions that the analysis will seek to answer are listed below:

1. Has Botswana integrated DRR into the curriculum?

2. How does the experiential learning approach help to enhance children's understanding of DRR education?
3. Are Botswana DRR policies and strategies aligned to international policies on the inclusion of DRR in the school curriculum?
4. How can integration of DRR be improved in the primary school curriculum in Botswana?

5.1 RESULTS FROM QUESTIONNAIRES WITH EDUCATORS

5.1.1 Coding

Through the data coding process different data categories were identified. This was done by looking at the common patterns and themes from the data. The coding of data was done by placing quantitative and qualitative responses from educators into different categories.

The discussion below will follow the participants' responses in each code and will be guided by the literature reviewed in Chapter 2 and 3.

Table 7: Codes and Categories

Questionnaires Category	Codes Emanating from Data
<ul style="list-style-type: none"> • Do you know the meaning of the word disaster (Yes, No or Not Sure) • If YES give a brief definition of the term disaster. • Do disasters happen in Botswana? (Yes, No or Not Sure) • Which are the disasters that inflict Botswana? • Do you understand the term DRR? (Yes, No or Not Sure) • Please define DRR 	Educators understanding of Disasters and DRR
<ul style="list-style-type: none"> • Have you taught students about disasters? (Yes, 	

<p>No or Not Sure)</p> <ul style="list-style-type: none"> • If your answer is “Yes”, under which subject did you teach about disasters? • Do you think it is important to teach students about DRR in the primary school in Botswana? (Yes, No or Not Sure) • If your answer is “Yes”, Why do you think it is important? • Which learning areas do you think can cover DRR? • What are the current challenges in teaching DRR in schools? • How can the teaching of DRR be improved? • Are you familiar with the five dimensions of DRR learning? (Yes, No or Not Sure) • If your answer is “Yes”, which are the dimensions? • Which methods do you think are most suitable for teaching DRR in primary schools? 	<p>Disasters and DRR curriculum integration (see section 2.1 on importance of teaching DRR)</p> <p>Dimensions (see section 2.4)</p> <p>Vertical Integration (see section 2.7)</p>
<ul style="list-style-type: none"> • What have you done with students when practising safety and procedures? • Do you think the children know what to do in case of a disaster? (Yes, No or Not Sure) • Do you know about disaster drills? (Yes, No or Not Sure) • Has your school ever conducted disaster drills? (Yes, No or Not Sure) • Do you think your school could be seriously affected by disasters one day? (Yes, No or Not Sure) 	<p>Teaching DRR through EL (see section 2.2.3)</p>

<ul style="list-style-type: none"> Do you think student and teachers will know what to do if a disaster strikes your school? (Yes, No or Not Sure) 	
<ul style="list-style-type: none"> Have you ever attended a DRR teaching workshop? (Yes, No or No Sure) If YES what was the focus of the training? 	Teacher professional development. (see section 2.2)
<ul style="list-style-type: none"> Do you know the policies that stipulates the integration of DRR into the curriculum in Botswana? (Yes, No or Not sure) If YES name the document. Do you think Botswana needs such a policy? (Yes or Not Sure) Motivate your answer? 	Botswana DRR policies (see section 3.2)
<ul style="list-style-type: none"> Which departments should work together to develop a suitable DRR curriculum in Botswana? 	Stakeholders for DRR curriculum integration

5.2 EDUCATORS UNDERSTANDING OF DISASTERS AND DRR

The following questions in this category sought to interrogate educators' understanding of disasters and DRR.

- Do you know the meaning of the word disaster (Yes, No or Not Sure)
- If YES give a brief definition of the term disaster.
- Do you understand the term DRR? (Yes, No or Not Sure)
- Please define DRR
- Do disasters happen in Botswana? (Yes, No or Not Sure)
- Which are the disasters that inflict Botswana?

5.2.1 Defining disaster

Disaster is defined by Kapoor (2012:2) as, “A result of the combination of hazard, vulnerability and inefficient capacity or measure to reduce the potential chance of risk.” This supports the definition of disaster as penned by UNISDR (2009:9) which argues that “Disasters are often a combination of the exposure to a hazard, the conditions of vulnerability that are present and insufficient capacity or measures to reduce or cope with the potential negative consequences.” In addition, Wisner et al (2012:30) defines disaster as “a situation involving a natural hazard which has consequences in terms of danger, livelihoods/economic disruption and/or casualties that are too great for the affected area and people to deal with properly on their own.” Many definitions have been written on the meaning of disaster but they all point to the same issues, that there is disruption of life and that disasters occur when the effects on the communities are too great for the communities to cope using their own resources.

As a point of departure educators were asked if they understood the meaning of the word disaster (see table 9). This was a simple yes, no or not sure question. In this instance, the majority of educators indicated that they knew the meaning of disaster except two. The two teachers came from the government and Cambridge curriculum schools, as shown in the table below.

Table 8: Meaning of disaster

QI	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	11	6	5	6	28
NO	0	0	1	0	1
Not Sure	1	0	0	0	1
Total	12	6	6	6	30

The question was further pursued by asking respondents to define the term disaster. Some of the definitions from respondents are as listed below.

5.2.1.1 Definition of Disaster from Educators

1. *“A situation that creates distress to the public and it usually leaves behind chaotic environment”.*
2. *“An extreme deviation from the normal which may be caused by natural and manmade events”.*
3. *“A calamity of natural or man-made proportion affecting the environment and or immediate human community”*
4. *“A natural catastrophe that causes great damage to property or loss of life”*

The definitions, given by the educators above, mostly mention destruction to loss of life and damage to the environment. Although words such as hazards, vulnerability and insufficient capacity to cope are not featuring prominently in the educators' definitions of the word disaster, the majority of the educators appeared to have grasped a basic understanding of the definition of the word disaster.

The question that followed sought to clarify the educators understanding of the term DRR.

5.2.2 Defining DRR

Disaster Risk Reduction as defined by UNISDR 2009:10) is, “the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disaster, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment and improved preparedness for adverse effects.” This definition relates well with Kapoor (2012:174) who defined disaster risk reduction as, “the conceptual framework of elements considered with the possibility to minimise vulnerability and disaster risks throughout a society to avoid or limit the adverse impacts of hazards within the broad context of sustainable development”. In other words disaster risk reduction is the process of identifying what the risks are and assessing them in order to be able to formulate strategies or implementing interventions to reduce the risk posed by the disaster.

The table below shows the level of understanding of respondents of the term disaster risk reduction.

Table 9: Defining DRR

Q2	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	8	6	2	4	20
NO	1	0	3	0	4
Not Sure	3	0	1	2	6
Total	12	6	6	6	30

The majority of the respondents (see table 10) indicated that they knew the meaning of the term DRR, with four (4) indicated that they did not know the meaning and six (6) were not sure of the meaning. The statistics shows that all the respondents from Primary Year Program Schools (PYP) indicated they knew the meaning of the term. Government schools had eight (8) respondents who indicated knowing the meaning. The Cambridge curriculum schools had only two (2) three who knew the meaning. The English Medium Schools had four (4) respondents who indicated they knew the meaning.

The responses from the PYP Schools could be attributed to the educators being familiar with the terms as disasters are part of the PYP curriculum. The responses from Cambridge schools showed a lack of understanding of the term. Detailed responses by educators on what they thought DRR was said to mean are elaborated on below.

5.2.2.1 Definition of DRR from Educators

Listed below are some of the definitions given by respondents. Four respondents from the Government Schools, two respondents from Cambridge Schools and two respondents from English Medium Schools did not give the meaning of the term. From some the responses received the following details were given:

1. *“Reducing the risk or occurrence of a disaster by putting in place preventive measures”.*

2. *“Those measures put in place to limit, prevent the severe impact of disasters”.*
3. *“Measures taken to reduce the onset/long term effects of perceived disasters”.*
4. *“Put action into place to prevent future disasters”*
5. *“Taking precautions to avoid disasters or contain a situation when it happens”.*
6. *“It is a systematic approach to identifying, assessing and reducing the risks of a disaster”.*

From the responses, it is clear that educators showed some understanding of the term DRR. However educators from PYP Schools presented a better understanding of the term DRR. This is an indication of the advantages the schools have through the teaching of disasters that is covered by their syllabus. The understanding of such terms like DRR could make the PYP schools more receptive to the idea of DRR curriculum integration as they already are exposed to the advantages.

Respondents were also asked to explain whether disasters happen in Botswana. The table below (see Table 10) show the distribution of the respondents.

5.2.3 Existence of disasters in Botswana

Table 10: Botswana disasters

Q3	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	9	6	5	3	23
NO	1	0	1	0	2
Not Sure	2	0	0	3	5
Total	12	6	6	6	30

The majority of the respondents acknowledged that disasters do happen in Botswana, with two (2) respondents indicated that disasters do not happen in Botswana while five (5) were not sure. From these seven (7) respondents who were not sure and who indicated that disasters do not happen in Botswana, three (3) came from the Government Schools and three (3) came from the English Medium Schools and one from Cambridge Schools. The majority of positive replies indicated that there is some

level of awareness of Botswana's disaster history amongst educators. However, because large scale disasters do not happen frequently, young educators may not be aware or sure that disasters happen.

5.2.4 Knowledge of disasters that impact Botswana

It was important to question whether the respondents were familiar with the disasters that impact Botswana in order to have an understanding of what they identify as common disasters.

Table 11 Botswana Disaster Profile

Q4	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	10	6	5	3	24
NO	1	0	0	1	2
Not Sure	1	0	1	2	4
Total	12	6	6	6	30

The majority of the respondents indicated that they knew the disasters that affect Botswana. This is an encouraging number which indicates that the educators knew Botswana's disaster profile (See 1.1 Research Context page 3). Of the remaining Six (6), two (2) indicated that they do not know the disasters that affect Botswana and four (4) indicated that they are not sure. One respondent from the Government schools who was not sure that disaster happen in Botswana went on to acknowledge knowing the disasters that impact Botswana, indicating that there might be confusion from the said respondent. Respondents from PYP all indicated that they know disasters that affect Botswana. Their responses went on to confirm that the schools have some knowledge of disasters. Only one respondent from the Cambridge schools was not sure of the disasters that affect Botswana. English Medium schools had only three (3) who knew the disasters that affect Botswana, indications of a weak curriculum.

5.2.4.1 List of disasters

The primary question was further interrogated when respondents were asked to list the disasters that they think could happen in Botswana. Disasters that could affect Botswana as listed by educators is summarised in Table 12.

Table 12: List of disasters

Government Schools	PYP Schools	Cambridge Schools	English Medium Schools
<i>Floods.</i> <i>Fires in homes.</i> <i>Floods in the North and veld fires.</i> <i>Malaria and drought.</i> <i>Heavy storms.</i> <i>Water shortage, floods and accidents.</i>	<i>Water shortage and drought.</i> <i>Epidemics such as malaria.</i> <i>Accidents, malaria and drought.</i> <i>Famine, veld fires.</i> <i>Heat wave</i>	<i>Road accident and wild fires.</i> <i>Veld fires and water shortage.</i> <i>Suicide.</i> <i>Floods.</i>	<i>Drought.</i> <i>Road accidents.</i> <i>Water shortage.</i>

Six respondents left that section blank as they had indicated earlier that they were not sure disasters happen in Botswana. The twenty-three (23) respondents who indicated the existence of disasters in Botswana showed that there was some level of disaster knowledge amongst the educators. The disasters that featured prominently in the list included floods, road accidents, veld fires, water shortage, malaria and drought. The disasters identified by educators correlate with the disaster profile of Botswana identified in Section 1.1 Research Context page 3.

There were twenty-eight (28) educators out of thirty (30) who indicated their understanding of the term disaster and twenty (20) out of thirty (30) who understood the term DRR. In percentage terms, this is 93% and 67% respectively. This is an

encouraging number that understands basic principles of disaster risk management (DRM) and DRR principles. Although some of the definitions given were not technically correct, this is understandable as there has been no integration of technical terminology in the current curriculum. Understanding basic terminology and rational behind disaster and DRR can be used as a platform for enhancing educators and the communities understanding about hazards around them, how to assess their vulnerability and enable them to put mechanisms in place to cope in the event a disaster occurs.

Amongst the schools responses, the PYP schools fared better in defining the concepts. This shows that PYP schools have already increased the basic level of DRM knowledge by integrating DRR into the primary school curriculum. The PYP definitions could be used as points of reference in the process of DRR integration. The most encouraging indication for DRR curriculum integration was the educator's knowledge of Botswana's risk profile which could probably make it easier for educators to work out lessons about each disaster.

It was paramount to explore further whether there was any DRR in the current primary school teaching. The following section will question whether DRR is integrated into the Botswana primary school education.

5.3 DISASTER RISK REDUCTION IN PRIMARY TEACHING

This question sought to interrogate the presence of DRR in the current primary school teaching. The question was guided by the Sendai Framework of Action (see section 3.2.4) and the Botswana Disaster Management Strategy which promotes the integration of disaster risk reduction in schools in Botswana. (See section 3.2.6). Teachers were required to indicate whether or not they have taught DRR in their schools. This line of questions was pursued regardless of Botswana indicating in its HFA final evaluation that there was no DRR integration into the curriculum (see section 3.3). The section was guided by the following key questions:

1. Have you taught students about disasters? (Yes, No or Not Sure)
2. If your answer is "Yes", under which subject did you teach about disasters?

3. Do you think it important to teach students about DRR in the primary school in Botswana? (Yes, No or Not Sure)
4. If your answer is “Yes”, why do you think it is important?
5. Which learning areas do you think can cover DRR?
6. What are the current challenges in teaching DRR in schools?
7. How can the teaching of DRR be improved?
8. Are you familiar with the five dimensions of DRR learning? (Yes, No or Not Sure)
9. If your answer is “Yes”, which are the dimensions?
10. Which activities do you think are most suitable for teaching DRR in primary schools?

5.3.1. Teaching students about DRR

The responses from educators on whether they had taught students about DRR are indicated on the table 13 below.

Table 13: The teaching of DRR

Q5	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
	7	6	4	3	20
NO	4	0	1	3	8
Not Sure	1	0	1	0	2
Total	12	6	6	6	30

From the above information, the majority of the respondents indicated that they have taught DRR, eight (8) indicated that they have not taught DRR while two (2) indicated that they were not sure. The educators from PYP schools all indicated that they have taught DRR. One of the respondents from the PYP schools indicated a unit within the Standard 6 syllabus dealing specifically with Natural disaster. Seven respondents out of

the twelve from government school also indicated they have taught DRR. Four (4) for Cambridge Schools and three (3) for English Medium School indicated teaching DRR.

The indications from the above statistics are that some government schools, Cambridge schools and English Medium schools teach disaster related themes even though there is no real integration yet. Educators have been innovative by themselves which is good for the future of DRR education as there is already commitment and interest from them to teach DRR, the educators just need more formalised guidance.

5.3.2 Learning areas that cover DRR teaching

For the teachers who indicated that they have indeed taught DRR, they were further asked to indicate the subjects that included disasters and DRR themes and topics. Below are the listed subjects.

Table 14: Learning areas

Government Schools	PYP Schools	Cambridge Schools	English Medium Schools
<i>Not disaster but safety but safety in Environmental science.</i> <i>Three (3) indicated DRR is not in syllabus.</i> <i>Social studies.</i> <i>Science</i> <i>Guidance and Counselling</i>	<i>Science and Social Studies</i> <i>PYP unit on Natural disasters</i>	<i>Creative and Performing Arts</i> <i>Health in Science</i> <i>English Science</i>	<i>Science, Standard 6 topic on weather, the science behind hurricane, cyclones and tornados.</i> <i>Earthquake, famine and volcanos</i> <i>Social studies and Science, weather topic</i>

Science and Social Studies had sixteen educators indicating them as the carrier of disaster and DRR topics. One of the respondents from PYP schools indicated that their Standard 6 Geography has a unit on natural disasters while one respondent from English Medium School indicated a Standard 6 topic on weather, the subtopics being the science behind cyclones, hurricane, and tornados. Knowing about the science behind such hazards encourages the exploration of the five dimensions of DRR learning, which helps the students in disaster preparedness, vulnerability and building resilience (see section 2.4).

It was also imperative to find out whether the respondents knew the importance of teaching DRR. The following question explores this narrative.

5.3.3 Importance of teaching DRR

Section 2.1 listed the importance of integration DRR into the curriculum as:

- Helps teach students how to identify and respond to risks in their community, thereby reducing vulnerability and building resilience in children.
- There will be a significant reduction of deaths and injuries due to better preparedness and increased capacity and knowledge regarding what to do in an emergency
- School attendance and learning is increased leading to longer life term earnings.
- Children will have a greater sense of security and confidence and will feel empowered and aware of activities that contribute to a reduced psychosocial impact of disasters and,
- Students in the classroom can also act as important information disseminators to everyone in the community relating to DRR and response

The table below shows the educators who know the importance of DRR teaching.

Table 15: Knowledge of Importance of Teaching DRR

Q6	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	12	6	6	6	30

NO	0	0	0	0	0
Not Sure	0	0	0	0	0
Total	12	6	6	6	30

All the respondents acknowledged the importance of teaching DRR to students. It can be argued that recognition of the importance of teaching DRR will make it easier for DRR curriculum integration as the educators who are the implementers of the curriculum already appreciate the importance of DRR education.

The question was further probed by requesting respondents to indicate reasons teaching DRR was important. Some of the responses relating to the importance of teaching DRR are given below:

1. *"Disasters happen unexpectedly and it's important for students to know"*
2. *"So that children are able to keep themselves and others to survive"*
3. *"To help students be aware of measures to take to reduce disaster"*
4. *"Learning about disasters may save lives so it is important to teach students about disasters."*
5. *"It's important for students to know safety precaution in order to survive the disaster."*
6. *"It helps them to manage disasters in their environment."*

Judging from the responses, indications point to a rich appreciation of the importance of DRR integration. Some of the important contributions are from respondent number three (3) Cambridge school, who indicated that *if students are taught about DRR they teach others*, and respondent number twelve (12) from the government school who indicated that, *it is important to teach students about DRR so that they are aware of measures to take to reduce disasters*. General responses included that DRR integration is key to saving lives and empowering students to be prepared.

In as much as the educators value the integration of DRR into the curriculum, it was important to interrogate the challenges they face with integrating DRR into the Botswana primary school curriculum.

5.3.4 Challenges in teaching DRR

The challenges that the educators faced in the teaching of DRR were listed and are as follows:

1. *"No direct institutional objective as per current syllabus. Again even the little that is in the syllabus is done with no emphasis. I think the problem is that teacher/educators have not seen the need since no fatal disasters have happened in Botswana."*
2. *"Shortage of materials, shortage of information on the matter, congested syllabus objectives, inadequate training on the subject for teachers."*
3. *"Because as it stands and to my knowledge there is no part of the curriculum that guides about teaching DRR and that will be too much for the curriculum."*
4. *"Mostly fictitious and not relevant to children as the disasters covered are not in Botswana disaster profile."*
5. *"Some of the disasters are not relevant to Botswana."*
6. *"Unavailability of a government policy document."*

Seven (7) educators did not respond; these are three (3) from government schools, two (2) from English Medium Schools and two (2) from Cambridge Schools. Most of the teachers acknowledged major challenges as lack of knowledge among educators on DRR education, lack of resources, lack of policies and direct institutional objectives that guide the current syllabus. Six (6) educators indicated that it was not part of the curriculum. Lack of skilled personnel to train the teachers was also identified as a barrier to integration. The lack of skills authenticates the need to give training to educators on the teaching of DRR (as is done by countries like Japan, Cuba and Georgia (see section 2.2). Some teachers felt that if DRR was to be introduced it would not be given much attention by teachers if the components of the module are not examinable. This notion was raised because government schools concentrate on examinable subjects to produce better results.

This was further interrogated by asking respondents how best the teaching of DRR could be improved. Responses included.

5.3.5 How to improve the teaching of DRR

Respondents indicated solutions to the problems that were listed above as follows.

1. *“First it must be part of the Botswana curriculum and not just infused but consciously be included as part of the curriculum. Secondly, it is important to note that as a topic it should be examinable/ tested to instil seriousness in its teaching and learning.”*
2. *“By putting in place clear guidelines on how to teach it and under what subject.”*
3. *“Include in the syllabus and train teachers.”*
4. *“Should be infused into every subject like HIV/AIDS. Make rigorous campaigns before or after a disaster.”*
5. *“All subjects must incorporate concepts of DRR like was done with HIV/AIDS introducing a subject might not work because of lack of time.”*

Seven educators did not respond, these are three (3) from Cambridge Schools, one (1) from PYP schools and four (4) from Government Schools. The rest of the respondents indicated different solutions to improving DRR teaching. Of the twenty (20) who gave solutions four (4) educators indicated using infusion of DRR themes and topics into existing subjects, like what was done with HIV/AIDS in Botswana. This would be an optimal way of promoting integration (see section 2.7). Infusion is a method of selecting basic concepts of DRR and integrating them in related topics in different subjects. As the current Botswana curriculum is overburdened with many subjects it is not suitable for an additional subject of DRR. This problem was also confirmed by some respondents (section 5.3.4). As such, the most suitable scenario would be to infuse DRR into the curriculum (see section 5.3.4, section 5.9.3 and section 5.9.6 responses on the congested curriculum).

Respondents also indicated that, to overcome the challenges of lack of skills in DRR teaching, the solution lay in better training modalities alluded to for Japan, Cuba, and Georgia which could serve as examples for Botswana (Section 2.2)

It was also important to also explore the methods of teaching that were thought to be most suitable for DRR teaching.

5.3.6 Activities suitable for DRR teaching

Educators listed the activities that they deemed important for DRR teaching. This was guided by Experiential Learning Theory which uses experiences of the children in their everyday lives (see section 2.2.3). Some of the activities used under EL include drills, role playing, hazards identification, community mapping, basic safety habits (see section 2.7). Respondents alluded to the following activities:

1. *"Frequent drills and visits from people who are experts in DRR."*
2. *"Demonstration, role play and audio visual learning."*
3. *"Pupils need to be exposed to visual information on the type of disasters, strategies of dealing and responding to them. They should visit fire department and be taught how to deal with fire."*
4. *"Practical application e.g. fire drills etc."*
5. *"Discussions, demonstrations picture presentation and practical work on disasters."*
6. *"Fire drills, propound songs and poems about disaster which is part of the curriculum. Educator workshops."*
7. *"Visual and physical experiences. In standard 6, we did mock earthquake, epidemic and shut down. Kids loved it (see EL)"*
8. *"Hands on practical work."*
9. *"Practical work, fire drills and role playing."*

Again the seven (7) respondents who did not contribute on the previous question also did not contribute on this question. However, drills, role plays and practical work which are some of the methods listed by the respondents resonated with EL. This shows that indirectly the respondents are acquainted with EL though they might not use the terms EL. Since the educators are aware of these activities this might make it easier for DRR teaching as EL activities would not be completely new to them. However, it would also be important to formalise EL into subsequence policy documents as well as in teacher training as they might not be familiar with all EL methods available to them.

EL works well when combined with the five dimensions of DRR learning. The following question will explore educators' understanding of the five dimensions of DRR learning.

5.3.7 Five dimension of DRR learning

It was important to interrogate whether the educators were familiar with the five dimensions of DRR education which are important in DRR education when used with the EL approach. Below is a list of the dimension:

Dimension 1: Understanding the science and mechanisms of Natural Disasters,

Dimension 2: Learning and Practising Safety Measures and Procedures,

Dimension 3: Understanding Risk drivers and how hazards can become disasters,

Dimension 4: Building Community Risk Reduction Capacity, and

Dimension 5: Building an Institutional culture of Safety and Resilience (Selby & Kagawa, 2014:11).

Table 16 below shows the responses.

Table 16: Familiarity with the 5 dimension of DRR education

Q9	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	0	0	1	1	2
NO	11	6	4	4	25
Not Sure	1	0	1	1	3
Total	12	6	6	6	30

The results on the table show that twenty-eight (28) teachers did not know the five dimensions of DRR teaching. The two educators who affirmed that they knew the five dimensions went on to list them below.

The majority respondents indicated that they had no idea of the five dimension of DRR learning except one from Cambridge schools.

1. *“Understanding risk drivers, becoming safety wise, building community risk reduction capacity.”*

The response from the Cambridge schools given above has largely formulated the correct two dimensions which are the understanding of the science and mechanisms of natural disasters and building an institutional culture of safety and resilience. More significant than the positive responses is the large number of negative responses. The low level of understanding of the dimensions of DRR education could be indicative of a curriculum that is shallow (or not fully integrated) in its teaching of disasters (see analysis in section 5.3.4) and the disasters that affect Botswana. Knowledge seems to stay at the level of basic conceptualisation and hazard knowledge only and does not go deeper into aspects of disaster risk management and risk reduction. (See section 2.6).

5.4 STUDENT DISASTER KNOWLEDGE THROUGH EL

The fourth category from the codes was that of Student disaster knowledge through EL. This was in line with the five dimension of DRR Learning (see section 2.4). The purpose of this category was to check whether DRR was being taught through EL. The following questions were used to interrogate this line of thinking.

- What have you done with students when practising safety procedures and measures?
- Do you think the children know what to do in case of a disaster? (Yes, No or Not Sure)
- Do you know about drills in disaster? (Yes, No or Not Sure)
- Has your school ever conducted a disaster drill? (Yes, No or Not Sure)
- If YES, how often do you conduct the drills?
- Do you think your school could be seriously affected by disasters one day? (Yes, No or Not Sure)
- Do you think student and teachers will know what to do if a disaster strikes your school? (Yes, No or Not Sure)

5.4.1 DRR teaching through EL

The respondents indicated a range of activities for which they practice safety procedures and measures. Below are the activities that the different schools teach the students

1. *“Demonstrating good safety patterns when travelling on school trips.”*
2. *“Road safety demonstrations and handling hazardous substances.”*
1. *“Fire drill, bomb threat drill, inquiries into natural disasters.”*
2. *“Disasters, safety and health.”*
1. *“Fire drills.”*
2. *“Practice safety measures.”*
1. *“Guidance and counselling on drug and alcohol.”*
2. *“Drop and roll for fire.”*

Road safety featured prominently in the government schools. Five of the nine educators from government schools who responded mentioned road safety practice that student are taught through the health and safety topic. Proper handling of chemicals and storage of hazardous substances are also some the activities students are taught. For the PYP Schools, students are exposed to fire and bomb drills as well as disaster drills which are part of the PYP curriculum. Of the four (4) educators who respondent from the Cambridge school, there is no uniformity of the hazards drills that they teach students, each teacher mentioned a different activity. The activities mentioned by the four (4) educators from Cambridge School are, fire drills, practice safety measures, walk not run in school, and use of protective clothing. These responses from Cambridge Schools show a lack of guidance in DRR safety measures and procedures.

Out of the six (6) educators from English Medium Schools, four (4) indicated the fire drill and evacuation, which shows there could be a system in place to practise these in the English Medium Schools. The other two (2) mentioned chemical handling and alcohol and drug abuse counselling taught through Guidance and Counselling teaching.

From the above responses, indications are that the government schools do practice safety measures and procedures through road safety, the PYP schools has a cross section of drills, and the English Medium Schools do fire drill and evacuation as their

main activities. It is only the Cambridge schools that do not seem to follow any guidelines. As there seem to be a background knowledge and experience from the schools in conducting EL orientated drills it could aid policy developers in coming up with all hazard drills to include in the DRR curriculum.

5.4.2 Student preparedness in case of a disaster

Respondents were asked whether their students would know what to do in case of a hazard. The table below shows the distribution of the responses

Table 17: Student hazard knowledge

Q12	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	7	6	2	5	20
NO	2	0	2	0	4
Not Sure	3	0	2	1	6
Total	12	6	6	6	30

The majority of the respondents mentioned that their students would know how to protect themselves in case of a disaster. From the responses that were given in the previous section 5.4.2, together with the above acknowledgement of students preparedness, this shows there is some level of DRR teaching. When it comes to DRR integration into the curriculum, this will make it easier as there is some background knowledge already existing. Even though there is no official integration of DRR in the curriculum, the community could already benefit from their children's disaster preparedness knowledge. This benefit could be amplified if clear policy, guidance and activities exist.

5.4.3 Disaster drills in schools

How often the schools practise disaster drills are listed on table 19 below:

Table 18: School that have conducted disaster drill

Q 13	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	0	6	2	5	13
NO	11	0	3	0	14
Not Sure	1	0	1	1	3
Total	12	6	6	6	30

The results from the above table indicate that the government schools had never practised disaster drill. As DRR is not covered in the Botswana primary school curriculum indications from the results are not surprising. However, since in the activities suitable for DRR teaching section, the government school educators cited, demonstrations, role plays and audio visual learning (section 5.3.6), it might be easier for the process of DRR curriculum integration to introduce drills (section 2.2.2). The PYP schools and English Medium School indicated that they have conducted disaster drills. This could help the process of DRR curriculum integration by using these schools to demonstrate the drills during workshops for government teachers. Cambridge schools had only two respondents who indicated conducting disaster drills while the other four did not respond.

The following question sought to ascertain whether educators think their schools will one day be affected by disasters.

5.4.4 Whether disasters will affect schools

It was important to explore the issue of disasters affecting schools, to find out whether the educators think their schools would one day be affected by disasters. The table below show the responses from educators.

Table 19: The effect of disasters on schools

Q14	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	9	6	1	2	18
NO	1	0	2	3	6
Not Sure	2	0	3	1	6
Total	12	6	6	6	30

The table above shows that only nine (9) out of twelve respondents from government schools thought their schools would be affected by disasters one day, all respondents from PYP believe their schools would be affected, one (1) respondent from Cambridge schools believed their school would be affected while two (2) from English Medium schools also agreed. These are the same educators that listed overwhelmingly that they understood the disasters that affect Botswana. Following the response to the question about disasters that affect Botswana, one would assume that there could be an overwhelming response of acknowledging that disaster might one day affect their schools. While most educators understood what disasters are and the disaster profile of Botswana, almost half of the educators do not make a link between disasters and how they can affect schools. This is in spite of the fact that, most educators indicated drought as one of the disasters that affect Botswana and they are already exposed to its effect through water rationing.

This anomaly might be symptomatic of the shallow level of DRR integration currently. So educators might know the different types of hazards but do not necessarily understand the interaction of hazards with social vulnerability. The exception to the rule was PYP schools who showed a great depth of understanding when it comes to DRR. Their knowledge of hazard could be used to train educators from other schools in hazard and vulnerability mapping, in preparation for the same activities in DRR education curriculum.

It was important to interrogate the question further by asking respondents why they think disasters might happen. Below are the responses

1. *“Disasters are getting more frequent for example bomb threats”*
2. *“Some disasters are caused by natural things.”*
3. *“Current conditions put schools at risk of national phenomenon such as drought, veld fires and lightning, exposed electric wires”*
4. *“Unmannered students like experimenting with electric plugs or open fire. The school garden is not protected with net shade and can be destroyed by heat wave.”*

Varied reasons of why the schools might be affected by disasters were given. From the responses it was clear that some of the educators knew what hazards are in their school localities and hence would be able to put measures to mitigate the effects of a disaster. Some of the hazards mentioned included, exposed electric wires, fires, bomb threats and droughts. With this kind of hazard knowledge from the educators it could be easier to plan activities to include in DRR education during the planning phase of DRR curriculum integration.

It was important for respondents to explain whether the students and their teachers would know what to do if disaster strikes the school.

5.4.5 Students and teacher knowledge when disaster strikes

Table 20: Student and Teachers DRR knowledge

Q15	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	5	4	1	3	13
NO	3	0	3	1	7
Not Sure	4	2	2	2	10
Total	12	6	6	6	30

Thirteen (13) educators from a group of thirty (30) indicated that students and teachers would know what to do if disaster strikes. From these thirteen, five (5) were from government schools, four (4) from PYP schools, and one (1) from Cambridge while

three (3) came from the English medium schools. The wide margin of those who would know what to do and those who would not know how to protect themselves in case of a disaster showed the shallowness of the DRR curriculum currently. Drills seem to be done in the schools but their effectiveness is questionable considering the huge gap between those educators and students who would know what do should a disaster strike. This exposes the need for DRR curriculum integration to include disaster drills that build on each other in which efficacy can be measured in building disaster knowledge amongst students.

The reasons why such a huge number would not be better prepared to deal with the disasters are listed below:

5.4.6.1 Respondents motivated their answers as follows

1. *“Awareness is not enough.”*
2. *“Students and teachers lack knowledge*
3. *“They would not know because they are not well informed’*
4. *“Lack of knowledge.”*
5. *“There is a health and safety policy in school which everyone is aware of.”*
6. *“They have practiced drills.”*
7. *“Teachers and students will survive because technology also empowers them.”*

There was general consensus amongst educators from the government schools that suggest a lack of knowledge in DRR would lead to teachers and students not knowing what to do in case of a disaster. Educators from PYP indicated that students would know because of the drills that they have learnt. Educators from the Cambridge Schools cited a lack of DRR education in the curriculum as a contributory factor to educators and students not knowing what to do. This lack of knowledge could lead to disruption of the school calendar, damage to school infrastructure, homelessness and lack of access to roads leading to schools, should a disaster happen (see section 2.1 and 5.8.2). This authenticates the need to integrate DRR into the Botswana curriculum in order to save lives and property. PYP schools could be used to share as much information as is needed for the successful integration of DRR into the curriculum since the schools

showed a good record in the teaching of DRR. Without DRR education, a disaster in Botswana would be catastrophic.

5.5 TEACHER PROFESSIONAL DEVELOPMENT

This category sought to interrogate the support that is given to teachers in terms of workshops on teaching DRR in order to empower them with the necessary skills to teach DRR. This was in line with the support given to teachers from countries that serve as good examples of DRR teaching (see section 2.2). The questions below sought to investigate whether the educators had attended any DRR teaching workshop and to clarify what the workshop entailed.

1. *Have you ever attended a DRR teaching workshop? (Yes, No or No Sure)*
2. *If YES what was the focus of the training?*

5.5.1 Number of educators who have attended DRR workshops

Table 22: DRR workshop attendance

Q16	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	0	1	0	0	1
NO	11	5	6	6	28
Not Sure	1	0	0	0	1
Total	12	6	6	6	30

Only one respondent from the PYP schools acknowledged attending a workshop on fire in homes and in schools. The rest of the respondents indicated that they had not attended a DRR workshop. As can be seen from the results above, Botswana currently has a total lack of teacher professional development support pertaining to DRR. Providing training to teachers on DRR education would be important in Botswana's efforts to integrate DRR into the primary school curriculum as it would give teachers

confidence to teaching the subject. It would also be essential as training may result in increased hazard knowledge which not only changes the teacher and students' risk behaviour but filters down to the community thereby increasing the whole community resilience.

5.6 BOTSWANA DRR POLICIES

DRR is a fairly new concept to Botswana. The National Disaster Risk Reduction Strategy (see 3.2.6) promotes the teaching of DRR at schools and complies with priority 3 indicator 2 of the HFA which stated that DRR should be included into the school curriculum. This category sought to determine whether educators were aware of the policies that guide the integration of DRR into the curriculum. The questions below guided the responses:

1. Do you know the policies that stipulate the integration of DRR into the curriculum in Botswana? (Yes, No or Not sure)
2. If YES name the document.
3. Do you think Botswana needs such a policy? (Yes or Not Sure)
4. Motivate your answer?

Respondents were asked to indicate whether they know the policies that guide the integration of DRR into the curriculum. Table 24 below show the responses.

Table 22: Knowledge of the policies that guide DRR integration into curriculum

Q 18	Government Schools	PYP	Cambridge Schools	English Medium Schools	Units
YES	0	0	1	0	1
NO	10	4	2	5	24
Not Sure	2	2	3	1	5
Total	12	6	6	6	30

Only one respondent gave Health and Safety as the policy (which was not correct), with twenty-four (24) respondents indicated that they did not know the policy. Five (5)

respondents indicated that they were not sure. The results from the table above show that most respondents lack knowledge of the DRR policies in Botswana. The question was further explored by asking teachers to name specific policy documents.

5.6.1 Naming the policy document

Only one respondent from the Cambridge School attempted to give the name of the policy but sighted Health and Safety policy which was not the correct policy. The results from table 24 and the subsequent follow up question are indicative of the lack of policy direction that would aid the integration of DRR into the primary school curriculum. Consequently, the formulations of such a policy should be prioritised by key stakeholders in Botswana's disaster management and education sector.

It was important to find out from the respondents whether they thought Botswana needed such a policy. Below are the reasons supporting the need to have a policy on DRR curriculum integration in Botswana' primary schools:

5.6.2 Reasons why Botswana needs a Policy

There was unanimous agreement from all the respondents that Botswana needed such a policy. Some of the reasons advanced by these respondents included:

1. *"DRR is important hence the need for a document that guides on how to include it in the curriculum."*
2. *"Policy drives people to search and pursue results. It would also guide people to have direction in DRR issues."*
3. *"To trigger the disaster awareness."*
4. *"No explanation on need for a policy."*
5. *"There is a need for stakeholders to lobby for a policy so that the Ministry of Education can put more emphasis in schools to educate students on minimising the impact of disasters in the community."*
6. *If people are aware there is a binding policy document policy they will be guided.*

The arguments advanced by the educators of the need for a policy are valid as policies are a guiding framework to the integration of DRR into the primary school curriculum (see section 3.2.6). This is important in as much as that having a policy gives direction

to all stakeholders on how to proceed with integrating DRR. Drafting a DRR integration policy would be simplified in the context of Botswana as the National Disaster Risk Reduction Strategy spells out the need for integration and promotes the need for awareness of DRR at school and in the communities known to be at risk (see paragraph 2 section 3.2.6). Respondents were also asked to name the stakeholders that are important in the drafting of the DRR curriculum integration.

5.7 STAKEHOLDERS FOR DRR CURRICULUM INTEGRATION

Respondents were requested to indicate the stakeholders that they thought were crucial in the integration of DRR into the Botswana primary school curriculum. The NDRMP provided a framework which guides all sectors and stakeholders in preparing their DRR plans (see section 3.2.6). The question below guided the questioning:

1. Which departments should work together to develop a suitable DRR curriculum in Botswana?

5.7.1 List of DRR stakeholders

1. *“All government departments and private institutions are needed as stakeholders.”*
2. *“National Disaster Management, Disaster Relief Fund.”*
3. *“Social studies, Environmental Science, PE, Science, Lab assistants.”*
4. *“All the departments should be involved.”*

Most respondents cited Ministry of Education and Department of Disaster Management as the major stakeholders. Ministry of Environment and Tourism, Police, Army and Ministry of Health were also cited. Four respondents did not attempt to answer the question, which could be attributed to the lack of understanding of the various stakeholders' responsibilities who could work together.

Multiple stakeholders' involvement is important to disaster initiatives because they would need to cooperate in cases of a disaster impact. Therefore disaster policies should be aligned to include multiple role players and clarify their roles and responsibilities to avoid conflict. The responses from the educators indicated that they have an idea of the importance of stakeholders in DRR curriculum integration. The most appropriate answer

came from those respondents who indicated all government departments. However, answers could have been more comprehensive if responses added private companies, NGOs and international organisation like UNDP in Botswana as stakeholders that could provide crucial input. All these stakeholders are important in the drafting of the DRR education policy and the process of DRR curriculum integration.

5.8 INTERVIEW WITH DISASTER MANAGEMENT OFFICE

5.8.1 Brief overview of the DMO work

The respondent gave a brief background to their work as involving public awareness raising on various disasters that affect the country. The responsibilities also included capacity building, training different stakeholders and communities as well as district disaster committees because the district committees are the ones who are at the operational level of management. The respondent indicated that the stakeholders were trained on basic introduction to disaster management, key disaster terminologies, how to contact disaster risk management plans as well as risk assessment.

5.8.2 Disasters and Schooling

It was also important to establish whether Botswana experienced any disasters and the mechanisms that they employed to make sure school programmes are not disrupted. The respondent explained that droughts, flooding and veld fires as the most prevalent disasters that affect Botswana. An example of how floods in Satau, Chobe Area and Tubu, in Okavango area were managed was given. In Tubu the affected students and educators from the local school were relocated to the Village Development Complex to enable schooling to continue. Families of those school going children were also relocated to villages nearer the complex. In Satau, the disaster team initially had thought of closing the school because as it was cut off from the main road, but decided against the idea as they realised there was no immediate danger.

5.8.3 DRR integration in the Botswana Curriculum

With the guidance of HFA and Botswana's National DRR Strategy Document, the respondent was asked about the state of DRR education in Botswana Primary Schools. The respondent acknowledged that not much had been done but some inroads had been made in two years before November 2015. Previously communication with the curriculum department had been through letters. However the Department of Disaster Management and Curriculum Development Unit had managed to meet once in July 2015 to discuss the Sendai Framework for DRR 2015-2030 (see 3.2.4). The respondent also indicated that Curriculum Department Unit requested a presentation on what DRR was, the disasters that affect the country, and how this information could be brought down to the level of the students. The respondent further indicated that the Curriculum Development Unit had also raised a concern on whether they would not burden the curriculum with an addition of DRR education (the same concern raised by educators see 5.3.4). The respondent indicated that the discussions were ongoing and considerations were on either having a standalone subject or a module. The respondent further indicated that the discussion between the Department of Disaster Management and Curriculum Unit also raised an important factor which was that of training of teachers. An issue was also raised by educators (see 5.5).

5.8.4 Mechanism to ensure DRR is integrated in the Curriculum.

Since there was no integration as yet, the department of Disaster Management was working with the Curriculum Development Unit to ensure integration was done.

5.8.5 Stakeholders in integrating DRR into the curriculum

The respondent indicated that besides Ministry of Education, there was also the UNDP which helped the department whenever there were workshops to be conducted. As indicated by educators in section 5.8, stakeholders could also include all government ministries.

5.8.6 Capacity Challenges

The respondent from the Department of Disaster Management indicated that there was lack of skilled manpower as very few people were trained or qualified in DRR. This derails the progress of DRR curriculum integration. An issue raised by respondents from schools (section 5.3.4).

5.8.7 The future of DRR Curriculum Integration

The respondent indicated that there was a lot of potential in DRR curriculum integration into the primary school curriculum as it will empower students to identify the risks around them and act on them. The two universities that are offering disaster management make it possible for primary schools teachers to gain interaction with the study of disasters and DRR.

5.9 INTERVIEW WITH CURRICULUM DEVELOPMENT UNIT

The Curriculum Development Unit was chosen as it is the custodian of the curriculum in Botswana and implements any changes to the curriculum. It was of paramount importance to interview the person responsible for DRR to get an insight on the level of DRR curriculum integration.

The respondent's duties at Curriculum Development Unit included being a social science officer as well as representing the curriculum department in the National Disaster Management Committee. The respondent indicated that the National Disaster Management Committee was the umbrella committee made of heads of government units and permanent secretaries. The respondent also represented the curriculum department as a strategic committee member driving issues of DRR. The strategic committee was also a group of directors from different ministries.

5.9.1 The state of DRR integration into the Botswana Primary School Curriculum

The second question sought to interrogate the state of DRR integration in the primary school in Botswana. The respondent indicated that DRR was a new concept to Botswana and the first time the department of curriculum heard about it was after the presentation on the Sendai Framework of Action by Disaster Management Office in July 2015. No one in the Ministry and the regional offices knew about DRR. The respondent indicated that since they were transforming the education system, the department would request the Disaster Management Office to give presentations on the Sendai Framework of Action especially those aspects that emphasise on DRR education.

5.9.2 The importance of DRR curriculum integration

The third question explored whether the respondent viewed integrating DRR into the primary school curriculum as worthwhile. The respondent indicated that since DRR was a proactive action, the citizens could be made aware of things that endanger their lives and could prepare in advance. The respondent further indicated that those in disaster prone countries were well prepared for disasters but in Botswana the citizens lacked knowledge and took things lightly. A case in point was the heat wave that Botswana was experiencing yet there was very little information on what people could do to protect themselves. The respondent also explained that the warnings of a heat wave were given but nothing was done to empower people. The respondent gave examples of people resisting to be moved when there were floods in the Okavango Delta and people running chaotically when there was an earth tremor in 2014 because they did not know what to do. The respondent further indicated that with veld fires, people run in wrong directions causing death and injury, hence the importance to integrate DRR into the curriculum.

5.9.3 Subject, themes and topics relating to DRR primary school curriculum

The fourth question sought to ascertain the subjects, themes and topics relating to DRR that should appear in the primary school curriculum. The respondent's views were that it would be best to have DRR cut across the curriculum. The respondent acknowledged

that there are topics that dealt with floods, drought and veld fires (section 1.1) that were already in the curriculum but were not emphasised on in relation to DRR.

5.9.4 Approaches for DRR curriculum integration

On the approaches of integration that Botswana primary schools should use on DRR curriculum integration, the respondent thought vertical integration would be best (Section 2.7) since it starts from pre-primary and the concepts build up and expand as one goes up the education ladder. This is the same method that Botswana used when integrating HIV/AIDS into the curriculum. On experiential learning, the respondent indicated that it was an unfamiliar approach to the department?

5.9.5 Views on shared management system

The respondent's views on shared management system in DRR education, between Disaster Management Office as policy makers and Curriculum Development as implementers were that, Disaster Management Office (D.M.O) were the custodians of issues relating to disaster management but when it came to the curriculum, the Curriculum Development Unit banked on DMO to assist them to integrate the concepts into the curriculum. The respondent further stated that DMO is a critical stakeholder to the Curriculum Development Unit as the Curriculum Development Unit will need DMO from time to time to monitor whether there is satisfactory level of DRR integration.

5.9.6 Problems that can affect the integration of DRR into the curriculum

This question interrogated the problems that the respondent envisaged in the integration of DRR into the curriculum. The respondent indicated that Curriculum Department had its own challenges. The priority for Ministry of Education was to improve results and the primary school curriculum was already overburdened. Teachers were dealing with an already congested curriculum; the addition of new concepts would put more weight on the curriculum. The respondent felt that some of the subject contents that were non examinable were already compromised (Section 5.4) and the issue of DRR integration would become complex and difficult.

5.9.7 Challenges in aligning the education policy with global trends in DRR education

This question was to explore whether there would be challenges in aligning the education policy with global trends in DRR curriculum integration. The respondent felt that, global trends in DRR education needed to be followed because that was where Botswana would get the guiding framework in DRR curriculum integration. However, there would be a need to remove those components of DRR education that are not relevant to Botswana and concentrate on disaster that are most prevalent to Botswana.

5.10 COMPARISON OF THE DIFFERENT RESPONSES

It is important to compare the responses on similar questions advanced by the respondents from the Curriculum Development Unit, Disaster Management Office and Educators from the schools. Focus will be on how the questions were tackled by the different respondents. This will guide the researcher on whether the different departments are at the same level or differ on some of the issues.

The question on Botswana's disaster profile was posed to both the educators and the respondent from DMO. Both the respondents gave similar views on the disasters that affect Botswana. These being, floods, drought, veld fires and road accidents (Section 1.1; Section 5.2.3.1 and Section 5.9.2). This indicates that there is knowledge of the disasters that are prevalent in Botswana among the different respondents. However, DMO seems not to take health and safety issues as serious issues that affect Botswana, especially road safety as this seems to be an issue with the government schools.

Respondents from the both curriculum unit and educators explored the teaching of DRR to students. DMO could not contribute as there was no question relating to the teaching of DRR. Seven (7) respondents from government schools indicated that they taught about DRR, with four (4) indicating that DRR was not in the curriculum. The majority of respondents from the other three types of schools indicated they teach students about DRR. This is because the PYP School teaches a different syllabus while the other two, teach beyond the government syllabus. The responses from the Curriculum

Development Unit contradicted that given by educators. The respondent indicated that DRR was a totally new concept and the first the department heard about it was during the Sendai Framework of Action workshop presented by DMO (section 5.9.1). This indicates that even though there is no institutional framework from the Curriculum Development Unit the educators are finding their own way in teaching DRR. The knowledge that the educators have acquired in their quest to empower students in DRR issues put them in better position to understand DRR issues when the integration of DRR into the curriculum is implemented. The skills acquired by the PYP in their disaster curriculum would also help if the Curriculum Development Unit engages them for guidance.

On the state of DRR in the Botswana curriculum, the respondent from Curriculum Development Unit indicated that DRR was a new concept in Botswana and as such it is yet to be included into the curriculum (see section 5.9.1) sentiments echoed by the respondent from DMO who indicated that not much had been done in terms of DRR curriculum integration at primary school level (see section 5.9.3). Educators also weighed in by indicating that DRR is not in the curriculum as such they encounter difficulties in teaching it (see section 5.3.4). These sentiments by respondents are correct as the HFA Final Progress Report 2015 attests to this (Section 3.3).

It was also important to explore the value that the different respondents placed on DRR integration into the primary school curriculum in Botswana (see section 5.9.2 for Curriculum Development Unit response, section 5.8.3 for DMO and section 5.3.3 for Educators response). Responses from Educators included;

- To save lives
- To empower students to be prepared
- To be aware of measures to take to reduce disasters

These responses resonated with those from the Curriculum Development Unit who indicated that by integrating DRR into the Botswana primary curriculum the citizens would be made aware of things that endanger their lives and could prepare in advance. The DMO acknowledged that the department had not done much in terms of integrating

DRR into the curriculum, a mandate that was given DMO by the HFA 2005-2015, priority 3 Indicator 2, this indicated lack of importance placed on DRR curriculum integration by the department.

The question was also raised on the challenges that affect the teaching of DRR. The DMO responded to the capacity challenges (see section 5.8.6), the educators responded to challenges in teaching DRR (see section 5.3.4), while the Curriculum Development Unit responded to problems that can affect the integration of DRR into the curriculum (see section 5.9.6). To this end, educators touched profoundly on lack of skills development for teachers, congested syllabus, no direct institutional object in the current syllabus and lack of resource allocation as major impediments in DRR teaching. Respondent from DMO indicated that there was lack of skilled manpower as very few people were trained or qualified in DRR and this would derail the progress of DRR curriculum integration (see section 5.8.6). The respondent from Curriculum Development Unit expressed concerns about the curriculum being overburdened and the main focus for the department was to improve results (see section 5.9.6). The Curriculum Development Unit never indicated the need for staff development or training of teachers in DRR teaching an issue which was paramount if new concepts were to be included in the curriculum. It was the DMO respondent who indicated that Curriculum Development Unit requested for training of teachers in DRR teaching (see section 5.9.3). Indications from educators and Curriculum Development Unit were also that as long as DRR education was not examinable there would not be any seriousness in teaching it.

On improving the teaching of DRR and the subjects, themes and topics to be included, the respondent from the Curriculum Development Unit indicated the need to have DRR cut across the curriculum through vertical integration, with topics dealing with floods, drought and veld fires, topics that are already in the curriculum but not being emphasised on (see section 5.9.3 and 5.9.4). The DMO respondent expressed the need to either have a standalone subject or a module. The educators needed clear guidelines and a syllabus in place and also suggested infusion of DRR into all subjects (see section 5.3.5). Vertical integration through the infusion of themes and topic in DRR was the

recommended method that could suite the integration of DRR into the Botswana primary school curriculum (see section 5.3.4).

The stakeholders in DRR integration were listed by educators and DMO. DMO indicated Ministry of Education and UNDP as their stakeholders. The educators also indicated DMO as well as all government departments. It was important for these respondents to indicate all private companies, NGOs and International organisations.

On policies, educators indicated the importance of having a policy as a guiding tool in DRR integration and that policies drive people to pursue and reach results. The Curriculum Development Unit indicated that it would be difficult to align the education policy to global trends in DRR education as this will require Botswana to select those concepts that are relevant to the disaster profile of Botswana. Although DMO did not answer a direct question to this end, the respondent does reflect that not much has been done, and key role players such as the UN and universities could play an important role in improving integration efforts once such policies are in place. Different stakeholders could also be key to the policy formulation.

5.11 CONCLUSION

The analysis was guided by the codes that emanated from the classification of data. These codes included, educators' understanding of disaster and DRR, disaster and DRR in the Curriculum, teaching DRR through EL, and Teacher Professional Development and Policies.

The information that emanated from the educators understanding of disasters and DRR was that the respondents understood the basic principles of DRM and DRR. Although the definitions given were not technically correct due to lack of DRR integration into the curriculum, educators had a good knowledge of Botswana's risk profile. The information that the educators already have will help them in implementing the DRR integrated curriculum as well as in formulating lessons for each disaster.

Although government schools lag behind in the teaching of DRR due to lack of DRR education in the curriculum, it was encouraging to note that the rest of the schools teach

DRR. These schools could help the government schools through DRR workshops. Educators appreciated the importance of integrating DRR into the curriculum, but highlighted the challenges that they encounter in this endeavour. The major challenges being, educators lack of knowledge and skills and an already bloated curriculum, should DRR education be introduced as a subject. The process of curriculum integration through vertical integration and infusing the themes and topics for DRR into every subject seemed to be the most ideal solution. Vertical integration and infusion are familiar concepts to all educators in Botswana as HIV/AIDS has been integrated in all subjects using the two concepts. Using these two concepts would aid in the DRR curriculum integration process and save on resources and time. The need to train educators to be competent in DRR education was also highlighted as an important step if DRR is to be successful.

Educators also proved to have some knowledge of EL through the activities that they suggested in DRR teaching, especial the educators from PYP schools whose contributions could aid the process of DRR curriculum integration. The EL activities listed by educators could also be formulated into policy documents and in teacher training. There is a rich knowledge of hazards and disaster drills from PYP schools. The process of DRR curriculum integration could be aided if these schools are taken on board to pass on the skills to other schools.

Indications were that Botswana had a total lack of teacher professional development support pertaining to DRR education, and this could impede the teaching of DRR as teachers lack skills and knowledge to implement a DRR curriculum at this stage. Providing teacher training and workshops on DRR education would be the key to successful implementation of the DRR curriculum.

As DRR is a fairly new concept to Botswana, all respondents were not aware of the policy document that stipulates the integration of DRR into the curriculum. Respondents did acknowledge the importance of such a policy which could help in the successful integration of DRR education into the curriculum.

There was general consensus amongst educators that a multitude of stakeholders should be responsible for the formulation of the DRR education policy as DRR involves all sectors (public, private and NGO) in Botswana.

The chapter to follow will focus on the conclusion and recommendations for the study. The conclusion will interrogate whether each of the objectives given in Chapter 1 were properly articulated. Recommendations will be made considering results from data analysis conducted.

CHAPTER 6: CRITICAL DISCUSSION AND RECOMMENDATIONS

6.0 INTRODUCTION

Chapter 4 focused on the methodology and data collection tools that were used in the study. The key data collection instruments that were used were semi-structured questionnaires, open ended questions, structured questions and observation. These data collection instruments were used with the educators from the ten schools in the greater Gaborone area.

The data collection instruments listed above were used in the investigation of whether there is integration of DRR in the Botswana primary school curriculum. This study was necessary as there was a realisation that children in Botswana remain vulnerable to hazards because the government has not given priority to the in-depth integration of DRR in the primary school curriculum.

Chapter Five presented the data analysis from the questionnaires and reports of the interviews contacted with the personnel from Disaster Management Office and Curriculum Development Unit. The questions were categorised into codes to allow for easy analysis. The codes were as follows:

1. Educators understanding of disaster and disaster risk reduction
2. Disasters and Disaster Risk in the Botswana curriculum,
3. Teaching DRR through EL
4. Teacher professional development
5. Botswana disaster risk policies
6. Stakeholders for Botswana DRR curriculum integration

The information that emanated from the coding process firstly indicated that teachers in Botswana have a base knowledge of disasters as they understood the basic principles of DRM and DRR. Although it was clear that government schools lagged behind in the teaching of DRR in its curriculum. Challenges for the teaching of DRR were highlighted and solutions to the challenges were suggested by all respondents. EL combined with the five dimensions of DRR education were explored as possible way of formulating

DRR activities as well as Vertical integration through infusion of DRR themes and topics were suggested methods of DRR curriculum integration in Botswana. It was also revealed that teacher professional development and training in DRR education were key to making DRR curriculum integration successful. Aligning DRR Policy with education was also suggested as an important element in DRR curriculum integration. Including multi-stakeholders in the DRR curriculum integration process was seen as key as they work together in cases of a disaster impact. The section to follow will elaborate on some of the findings mentioned here as a means to illuminate the specific conclusion and recommendations of the study.

6.1 CONCLUSIONS OF THE RESEARCH

This chapter will align the research questions formulated for the study with the conclusions that were derived from the literature review and data analysis process with the view of providing findings and recommendation for the study. As a point of departure it is crucial to review the research objectives and questions outlined for the study.

The research objectives formulated for the study are as follows:

1. To explore whether Botswana has integrated DRR in primary school education.
2. To discuss how experiential learning approach may enhance children's capacity in DRR
3. To explore how DRR policies and practices in Botswana are aligned to international DRR policies and strategies.
4. To recommend ways of integrating disaster risk reduction in the curriculum in order to educate and raise DRR awareness in response to the Sendai Framework, Priority for Action 1, Indicator 24 (I).

Research questions were formulated and aligned to each of these objectives in order to answer a specific question. The research questions as provided in Chapter 1 are as follows:

1. Has Botswana integrated DRR into the curriculum?

2. How does the experiential learning approach help to enhance children's understanding of DRR education?
3. Are Botswana DRR policies and strategies aligned to international policies on the inclusion of DRR in the school curriculum?
4. How can integration of DRR be improved in the primary school curriculum in Botswana?

This section to follow will discuss each of the research questions and the applicable results that emanated from the research.

6.2 CONCLUSIONS RELATING TO RESEARCH QUESTIONS

6.2.1 Is DRR integrated into the Botswana curriculum?

There is increased recognition of the benefits of integrating DRR into primary school curriculum as indicated on Section 2.1. The analysis also revealed that teachers in Botswana acknowledge the importance of teaching DRR to students. However, literature revealed that Botswana has not integrated DRR into the Botswana curriculum and this was supported by the teachers, and CDU respondent. However, there are themes and topics that the teachers acknowledge teaching (section 5.3.2). This indicates that there is some level of DRR teaching in Botswana.

6.2.2 How does the experiential learning approach help to enhance children's understanding of DRR education?

The literature revealed that EL is a beneficial method of integrating DRR into the existing curriculum in section 2.3. A prominent reason for this was that EL facilitates the engagement of students in direct experience with their environment and focused reflection thereby building students' capacity on DRR. The analysis revealed that indirectly the educators in Botswana were acquainted with EL (though they do not use the term EL) and were aware of activities such as disaster drills, role plays and

demonstrations that form part of EL. The basic level of awareness of EL could make it easier for the formulation of DRR teaching activities in Botswana.

Literature also indicated that, linking of the five dimensions of DRR learning with the corresponding stages of EL cycle (which the respondents were not familiar with section 5.3.7) provided a theoretical benefit in DRR education. Botswana curriculum integration would benefit immensely from the marriage between EL and Five dimensions of DRR learning, as it is seen to contribute to an interdisciplinary, integration and holistic education that cover disaster management in depth. It would also be important for educators to receive training in these two facets of DRR education in order to add value to the quality of DRR in Botswana disaster curriculum.

6.2.3 Do Botswana's DRR policies and strategies conform to international policies on the integration of DRR in the school curriculum?

The literature revealed that, there is increased international recognition (judging by the number of DRR policies, strategies and frameworks that have been produced) of the need to integrate DRR education into primary school curriculum. DRR is a fairly new concept to Botswana and in line with the international trends, Botswana has a National Disaster Risk Reduction Strategy that promotes the teaching of DRR at schools. Botswana's strategy complied with the now lapsed priority 3 indicator 2 of the HFA which stated that DRR should be included into the school curriculum.

The analysis revealed that regardless of Botswana having DRR strategy in place, it has not fully embraced DRR education into curriculum integration as it needs to be aligned with the education policy, a point raised by curriculum development unit in section 5.9.7. The investigation revealed that the educators from all the schools were not aware of the policy that guides the integration of DRR in the school curriculum (section 5.6). These results are indicative of the lack of policy direction that would aid the integration of DRR into the primary school curriculum. Consequently the educators unanimously agreed on the importance of having the policies in place as the formulations of such a policies would guide the successful integration of DRR into the primary school curriculum.

6.2.4 How can integration of DRR be improved in the primary school curriculum in Botswana?

The study discovered that there was limited DRR curriculum integration in Botswana, which was the core of this study. The different respondents such as the PYP schools indicated they taught disaster education as it was within their syllabus, the English Medium Schools covered a topic on weather which looked at the science behind the occurrence of the different weather systems, but most of the government schools and Cambridge schools respondents indicated that DRR was not part of the curriculum.

Respondents from the Curriculum Development Unit indicated that DRR integration into the primary school curriculum could be employed using vertical integration. The concept of vertical integration is not new to Botswana (curriculum development unit suggested this in section 5.9.4) as Botswana previously used vertical integration through infusion of theme and topics in the integration of HIV/AIDS. Vertical integration calls for the teaching and reinforcement of topics at different stages of development, and learning outcomes through the academic standards are structured such that the student is enabled to handle more complex material as he/she matures. Since vertical integration is familiar to Botswana, using vertical integration would be a huge advantage to Botswana as educators would need minimal training.

6.2.4.1 Challenges to integration

Indications from educators and Curriculum Development Unit were that, the current Botswana curriculum is overburdened with many subjects and an additional subject of DRR education would therefore not be practical (section 5.3.4 and 5.9.6). Instead an infusion of DRR themes and topics into different subjects through vertical integration was suggested by educators and Curriculum Development Unit (section 5.3.5 and 5.9.4)

All respondents indicated that Botswana currently has a total lack of teacher professional development support pertaining to DRR education. Indications from Curriculum Development Unit, Disaster Management Office and educators, were that if teachers were given sufficient training in DRR education, they would be confident enough to teach the students, which may result in changes in the students' risk

behaviour. These behaviours could then filter down to the community thereby increasing the whole community resilience. This finding confirms the theory postulated in section 2.1.

6.2.5 What mechanism can be employed to enhance children's coping capacity and resilience to disaster risk in Botswana?

The data collected illustrated that for DRR messages to reach every home and community, informal and formal education through schools must be employed. This includes emphasising on DRR through activities such as disaster drills. The study found that drills are familiar to most respondents from the schools as they use them mostly in fire drills. The disaster drill activities could include, demonstrations, drama, dance and music, (as listed in section 5.3.6). These activities aid in developing a student's analytic skills and problem solving skills, which in turn could be used to improve communities overall level of resilience and disaster preparedness.

The literature study, found that the five dimensions helps us to know more about the science of disasters. It is argued that understanding the science of disasters help the students to comprehend and operationalize concept such as disaster preparedness, vulnerability and building resilience (section 2.4). However, data collected revealed that all educators in Botswana are not familiar with the five dimensions of DRR learning which are very important when used together with EL (section 5.3.7). This revealed that Botswana children's coping capacity and resilience to disaster is severely compromised as they are not exposed to knowledge relating to the science behind disasters.

6.3 FINDINGS RELATING TO THE CENTRAL THEORETICAL STATEMENT

The central theoretical statement was that for DRR integration in Botswana school curriculum to be successful, it should use theories of learning that help in building students' capacity in DRR such as EL.

The findings from the study acknowledge the importance of theories of learning in DRR education especially the EL which is propagated by Ord (2012:56). Literature in section

4.0 supports that students need to be purposefully engaged in direct experience and focused reflection, in order to increase knowledge, develop their skills and clarify values (Armstrong and Fukami, 2008:33).

The study found that EL theory would be an appropriate method of DRR integration in the curriculum as it uses the student's experiences in their everyday lives, thereby building their capacity in DRR. Results indicated that most respondents from the four types of schools are familiar with activities that resonate with EL (although they do not use the term EL) as the practical activities such as drama, demonstrations and role play that they teach students resonate with EL. (section 5.3.6).

6.4 RECOMMENDATIONS

The recommendations will focus on issues emanating from the findings and will focus on proposals aimed at the successful integration of DRR into the Botswana primary school curriculum as well as future research that may be undertaken.

6.4.1 Recommendations of the issues that emanated from the research

Government should commit to DRR curriculum integration and teacher training to support the teaching of DRR education.

Formalise DRR education, EL and the Five Dimensions of DRR education into subsequent policy documents as well as in teacher training.

Primary Year Programme Schools may partner with the government schools, Cambridge schools and English Medium Schools in teacher professional development in DRR education courses as well as DRR teaching resources mobilisation.

Use infusion through vertical integration to integrate DRR into the primary school curriculum as it is a familiar approach to Botswana education.

It is recommended that multiple-stakeholders should be involved in formulating an integrated DRR curriculum. These stakeholders should remain involved once the

curriculum and policy has been formulated and provide cooperation to ensure that adequate resources are allocated to implement the curriculum

6.4.2 Recommendations for future research

Develop an evaluation of the DRR integrated curriculum for its completeness in addressing vulnerability and resilience issues.

Formulate an appropriate DRR education student assessment which is both summative and formative in nature.

Develop a monitoring guide for the compliance of the schools in teaching DRR education.

Conduct a research project on DRR education areas for teacher professional development.

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APPENDIX A: INTERVIEW QUESTIONS WITH NATIONAL DEPARTMENT OF DISASTER MANAGEMENT

INTRODUCTION

My name is Sebia Mutasa, a graduate student with the Department of Disaster Studies at North West University in South Africa. Part of my studies require that I engage in a field of research covering my area of interest which is to analyse the integration of disaster risk reduction in the Primary School curriculum in Botswana.

I am kindly requesting your participation in this interview by answering a few questions, as detailed below. I give you my assurance that the information that will be gathered in this exercise is strictly for academic purposes and the confidentiality of the respondents will be respected.

Please allow me to use my recorder as this will enable me to follow through the interview without missing out on very important points arising from this interview.

INTERVIEW QUESTIONS

1. Would you kindly give me a brief introduction to your work?
2. How often has Botswana been experienced disasters since 2005, and what type of disasters has the country experienced?
3. What mechanisms did you employ to ensure schooling was not disrupted during flooding?
4. In your HFA progress report 2009-2011 you response to the question 'Is DRR included in the school curriculum" was a 'NO'. In your National DRR Strategy document 2013-2018 you promote the integration of DRR into the curriculum. How would you describe the state of DRR education in Botswana primary schools today?

5. What mechanisms are you employing to ensure that DRR themes and topics are now being integrated into the primary school education curriculum?
6. Who are your key stakeholders in this regard?
7. What is your department doing to support the education sector in integrating DRR into the curriculum?
8. What are the capacity challenges that your department faces in ensuring DRR is integrated into the curriculum?
9. How do you see the future of DRR education in Botswana?

THANK YOU FOR YOUR TIME

APPENDIX B: INTERVIEW QUESTIONS WITH CURRICULUM DEVELOPMENT UNIT

Introduction

My name is Sebia Mutasa, a graduate student with the Department of Disaster Studies at North West University in South Africa. Part of my studies requires that I engage in a field of research covering my area of interest which is to analyse the integration of disaster risk reduction in the Primary School curriculum in Botswana.

I am kindly requesting your participation in this interview by answering a few questions as detailed below. I give you my assurance that the information that will be gathered in this exercise is strictly for academic purposes and the confidentiality of the respondents will be respected.

Please allow me to use my recorder as this will enable me to follow through the interview without missing out on very important points arising from this interview.

1. Would you kindly give me a brief introduction to your work?
2. How would you describe the state of disaster risk reduction (DRR) Education in primary schools Botswana?
3. What are your views on integrating DRR into primary school curriculum, do you think it is worthwhile?
 - b. In one of the schools that I approached for my educator questionnaires, the Headmaster expressed his worries about what could happen if the school is affected by an earthquake, he wondered what the children would do to save themselves.
4. In which subjects and grades do themes and topics relating to DRR appear in the primary school curriculum?

5. Which approach of integration does Botswana primary schools use to teach DRR Education?
6. What are your views on experiential learning approach in teaching DRR education in the primary school in Botswana?
7. One of the National Disaster Management Strategy objectives is to integrate DRR into the curriculum. How far has your department gone in making sure DRR is integrated into the curriculum?
8. Is there a link person in every primary school responsible for DRR?
9. What are the responsibilities of the person?
10. How do you view shared management system in DRR Education, where National Disaster Management Office comes up with the policy and Min of Education becomes the implementers?
11. What challenges would the curriculum face if DRR education is to be integrated into the curriculum?
12. Globally, countries are warming up to the idea of integrating DRR into the curriculum. This is due to the disaster challenges that the world is facing. Do you envisage any problems with aligning your education policy with the global trends in DRR education? If your answer is yes, please elaborate.

THANK YOU FOR YOUR TIME

APPENDIX C: PERMIT TO CONDUCT A RESEARCH STUDY (MINISTRY OF EDUCATION)

TELEPHONE (027) 3655469
TELEX: 2944 THUTO BD
FAX: 3185167



REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION
AND SKILLS DEVELOPMENT
PRIVATE BAG 005
GABORONE

REFERENCE: DPRS 7/1/5 XXII (24)

08 October 2015

Ms Sebia Mutasa
PO Box 3076
Gaborone

Dear Madam

RE: PERMIT TO CONDUCT A RESEARCH STUDY

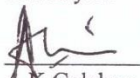
This serves to grant you permission to conduct your study in the sampled areas in Botswana to address the following research objectives/questions /topic:

A critical analysis of the integration of disaster risk reduction in Primary School curriculum in Botswana.

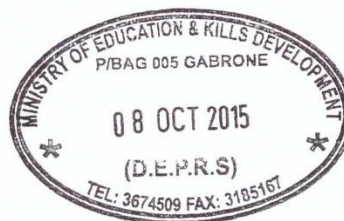
It is of paramount importance to seek **Assent** and **Consent** from the Regional Director of South East, Director of the Department of Curriculum Development and Evaluation, School Heads and teachers of Primary schools that you are going to collect data from. Administering of questionnaires/interviews to teachers should be done in the afternoon to avoid interference to their normal class lessons. We hope that you will conduct your study as stated in your proposal and that you will adhere to research ethics. Failure to comply with the above stated, will result in immediate termination of the research permit. The validity of the permit is from **8th October 2015 to 7th October 2016**.

You are requested to submit a copy of your final report of the study as stated in the Research Guidelines (para 4.5 - 4.6, 2007) to the Ministry of Education and Skills Development, in the Department of Educational Planning and Research Services, Botswana.

Thank you.


A.K. Galeboe

For/Permanent Secretary



APPENDIX D: RESEARCH PERMIT AUTHORISATION (OFFICE OF THE PRESIDENT)

TELEGRAMS: PULA
TELEPHONE: 3950800
TELEX: 2655 BD



OFFICE OF THE PRESIDENT
PRIVATE BAG 001
GABORONE

Ref: OP 5/59/8 XVI (3)

05 August, 2015

Ms Sebia Mutasa
P.O. Box 3076
Gaborone

Dear Sir,

RE: APPLICATION FOR RESEARCH PERMIT – MS SEBIA MUTASA

Reference is made to above subject matter.

You are herewith granted permission for research permit to conduct a study titled:
"Acritical Analysis of the integration of Disaster Risk Reduction in Primary School Curriculum in Botswana".

The permit is valid for a period of 4 months.

- i. Copies of any report/papers written as a result of the study are directly deposited with the Office of the President.
- ii. The permit does not give authority to enter any premises, private establishment or protected area. Permission for such entry should be negotiated with those concerned.
- iii. You conduct the project according to the particulars furnished in the approved application taking into account the above conditions.
- iv. Failure to comply with any of the above stipulated conditions will result in the immediate cancellation of the permit.

Thank you.

Yours faithfully,



F.J. Ramsay

For/PERMANENT SECRETARY TO THE PRESIDENT

Copied to: Director, Botswana National Library Services
Director, National Disaster Management