

INTEGRATION OF DISASTER RISK REDUCTION IN THE TEACHING OF PRIMARY SCHOOL CURRICULUM IN BOTSWANA: A CRITICAL ANALYSIS AND REFLECTION

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Abstract

The purpose of the study was to establish the extent to which disaster risk reduction (DRR) is integrated into the primary school curriculum. As part of the study, enabling and inhibiting to effective integration of DRR in the curriculum, strategies and activities that are used to enhance the integration process are discussed. A sample of 30 teachers and 2 education officials were selected to participate in the collection of quantitative and qualitative data respectively. Results of the study showed that robust staff training, ensuring that DRR is taught across curricular areas, availability of DRR integration implementation guidelines, and ensuring that DRR is examinable can be used as factors and strategies for enabling effective integration of DRR into the curriculum. The study also showed that factors such as lack of resources, lack of skills to manage disasters should they happen, lack of policies and direct institutional objectives that guide the current syllabus pose challenges to effective integration of DRR into the curriculum. It was recommended that the government and other stakeholders need to start robust training programmes and ensuring availability of resources as some of the urgent interventions for the integration process to succeed.

Keywords: Integration, disaster risk reduction, curriculum, teaching, benefits, challenges

1 Introduction

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). 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) 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) 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; 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). Children play an important role in the preparation of disasters (Evans & Oehler-Stinnett, 2006) as the education of a child has the potential to influence others in the home through sharing of information from school (King, 2013).

The above examples show the advantages of integrating disaster risk reduction in the school curriculum. Selby and Kagawa (2012) 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) 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.

The study is guided by the following research questions:

- How do teachers view the integration of DRR into the curriculum?
- What are the benefits of integrating DRR into the curriculum?
- What factors act as enablers for effective integration of curriculum into the curriculum?
- What factors act as barrier to effective integration of DRR into the curriculum?

2 Literature review

2.1 Concept clarification

Disaster is defined by Kapoor (2012) 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) 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) 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. Disaster Risk Reduction is defined by UNISDR (2011) 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) and also Makuna (2015) define 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." On the other hand, curriculum is defined as 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). This means that curriculum is what is taught and what students learn.

2.2 The importance of integrating DRR into the school curriculum

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, 2008:2). 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 from 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.

3 Theoretical framework

The current study is informed by the Lewin's experiential learning model cited in Ord (2012:56) as shown in Figure 1. 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.

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.

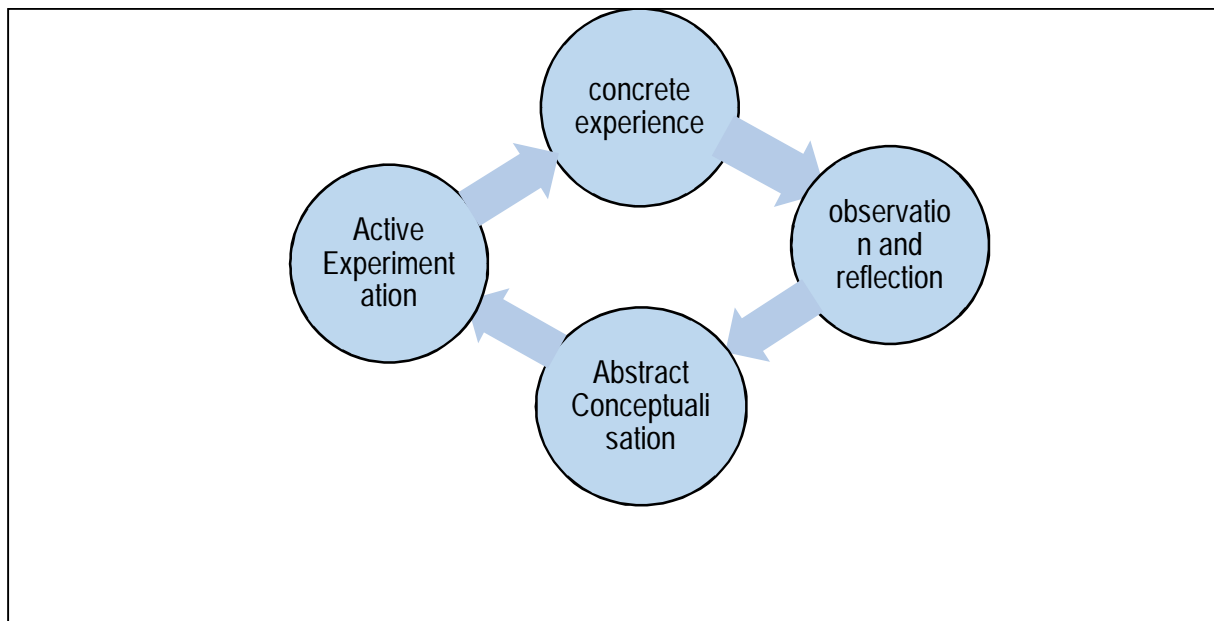


Figure 1: Experiential learning model: Source: Ord (2012:56)

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. 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).

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, 2014:40). 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 therefore relies on internal processing which give rise to conceptual interpretation which is termed abstract conceptualization.

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.

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.

4 Methodology

4.1 Research design

The current study employed a concurrent triangulation design which according to Du Plessis and Majam (2010:459) is also referred to as the parallel research design within the confines of the mixed methods approach. The use of both qualitative and quantitative research methods in the same study (mixed method) also allowed for methodological triangulation to be used (Bryman, 2012; Creswell, 2003). Triangulation is the combination of different research methodologies to study the same phenomenon (Johnson et al., 2007).

4.2 Instrumentation and sampling

Structured and semi-structured questionnaires were used for collecting quantitative data from a sample of 30 teachers selected from six primary schools. The researchers 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). 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. Purposive sampling was used to select two officials from the Curriculum Development Unit and Disaster Management to be interviewed as they were viewed as better placed to provide the required information.

4.3 Data analysis

Narrative analysis which is the transcription of experiences and interviews (Teddlé & Yu, 2007) was used for analysis of qualitative data. Through the narrative analysis the researchers sorted and reflected on the data, enhanced and presented it in a revised shape for better understanding by 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 (Bless, 2006:102; Greene & Caracelli, 1997) was used. Quantitative data was summarized and analysed using graphs and tables.

5 Analysis of results

Table 1: Understanding what a disaster is

	Government Schools %	PYP %	Cambridge Schools %	English Medium Schools %	Total %
YES	27	20	6	14	67
NO	3	0	10	0	13
Not Sure	10	0	4	6	20
Total	40	20	20	20	100

The majority of the respondents, that is, 67% (see Table 1) indicated that they knew the meaning of the term DRR, with 13% indicated that they did not know the meaning and 20% were not sure of the meaning. The statistics shows that most of the respondents indicated they knew the meaning of the term. Government schools had 27% respondents who indicated knowing the meaning. The Cambridge curriculum schools had only 6% who knew the meaning. The English Medium Schools had 14% of 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.

Table 2: Existence of disasters in Botswana

	Government Schools %	PYP %	Cambridge Schools %	English Medium Schools %	Total %
YES	30	20	17	10	77
NO	3	0	3	0	6
Not Sure	7	0	0	10	17
Total	40	20	20	20	100

Results in Table 2 show that the majority of the respondents (77%) acknowledged that disasters do happen in Botswana, with 6% of the respondents indicating that disasters do not happen in Botswana while 17% of the respondents not being sure. From these 17% respondents who were not sure and who indicated that disasters do not happen in Botswana, three 7% came from the Government Schools and 10% came from the English Medium Schools and one from Cambridge Schools. The majority of positive replies indicated that there is some high level of awareness of Botswana's disaster occurrences amongst educators. However, because large scale disasters do not happen frequently, young educators may not be aware or sure that disasters happen.

Table 3 Botswana Disaster Profile

	Government Schools %	PYP %	Cambridge Schools %	English Medium Schools %	Total %
YES	34	20	16	10	80
NO	3	0	0	3	6
Not Sure	3	0	4	7	14
Total	40	20	20	20	100

It is shown in Table 3 that the majority of the respondents (80%) indicated that they knew the disasters that affect Botswana. This is an encouraging number which indicates that the educators knew Botswana's disaster profile. Of the remaining 20%, 6% indicated that they do not know the disasters that affect Botswana while 14% indicated that they were not sure. 3% of the respondents from the Government schools were not sure that disasters happen in Botswana. 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 4% of the respondents from the Cambridge schools were not sure of the disasters that affect Botswana. English Medium schools had only 10% who knew the disasters that affect Botswana which shows that disasters and their reductions are not seriously covered in these schools' curriculum.

Table 4: Types of disasters in Botswana

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>Water shortage and drought. Epidemics such as malaria.</i>	<i>Road accident and wild fires.</i>	<i>Drought.</i>
<i>Malaria and drought.</i>	<i>Accidents, malaria and drought.</i>	<i>Veld fires and water shortage.</i>	<i>Road accidents.</i>
<i>Heavy storms.</i>	<i>Famine, veld fires.</i>	<i>Suicide.</i>	<i>Water shortage.</i>
<i>Water shortage, floods and accidents.</i>	<i>Heat wave</i>	<i>Floods.</i>	

Table 4 shows that disasters that featured prominently in the list in Botswana included floods, road accidents, veld fires, water shortage, malaria and drought. The disasters identified by educators correlate with the disaster profile of Botswana. Government and PYP schools identified more disasters than the remaining schools and most of the disasters they identified are more of natural disasters than man-made. On the road accidents (man-made disasters) feature more in English Medium schools and Cambridge schools than in other school types.

Table 5: Implementation of DRR in school curriculum

	Government Schools %	PYP %	Cambridge Schools %	English Medium Schools %	Total %
YES	25	20	12	10	67
NO	12	0	5	10	27
Not Sure	3	0	3	0	6
Total	40	20	20	20	100

Table 5 shows that the majority of the respondents (67%) indicated that they have taught or are teaching DRR as part of their curriculum, 27% indicated that they have not taught DRR while 6% indicated that they were not sure. All educators from PYP schools (who constituted 20% of the

sample) indicated that they have taught or are teaching DRR. 25% of respondents from government school indicated that they are teaching or have taught DRR. 12% from Cambridge Schools and 10% from English Medium School indicated teaching or having taught DRR. The results in Table 5 therefore indicate that some government schools, Cambridge schools and English Medium schools are implementing hence have integrated disaster related themes into their curricular.

Table 6: Learning areas that incorporate DRR

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

Results in Table 6 show that Science and Social Studies are the most popular learning areas in terms of where disaster and DRR topics are mostly found and taught. 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.

Table 7: Knowledge of Importance of Teaching DRR

	Government Schools %	PYP %	Cambridge Schools %	English Medium Schools %	Total %
YES	40	20	20	20	100
NO	0	0	0	0	0
Not Sure	0	0	0	0	0
Total	40	20	20	20	30

Table 7 shows that all the respondents (100%) acknowledged the importance of teaching DRR to students. It could be argued that having knowledge of the importance of teaching DRR makes it easier for DRR curriculum integration as the educators who are the implementers of the curriculum already appreciate the importance of DRR education and in some way shows positive attitudes.

5.1 Challenges in teaching DRR

From interviews conducted, respondents indicated the following as challenges the educators faced in the teaching of DRR were listed and are as follows:

- *“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.”*
- *“Shortage of materials, shortage of information on the matter, congested syllabus objectives, inadequate training on the subject for teachers.”*
- *“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.”*
- *“Mostly fictitious and not relevant to children as the disasters covered are not in Botswana disaster profile.”*
- *“Some of the disasters in textbooks and other learning materials are not relevant to Botswana.”*
- *“Unavailability of a government policy document.”*

The above results show that most of the teachers acknowledged major challenges that affect effective integration of DRR into the curriculum as lack of resources, lack of skills to manage disasters should they happen, lack of policies and direct institutional objectives that guide the current syllabus. Some educators indicated that DRR was not part of their 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. Some teachers felt that if DRR was to be effectively integrated into the curriculum and be given adequate attention by teachers all the components of the module needed to be examinable. This notion was raised because government schools especially concentrate on examinable subjects to produce better results.

5.2 How to improve the teaching of DRR

With regards to strategies that could be used to improve the integration of DRR into the curriculum, respondents indicated the following:

- *“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.”*
- *“By putting in place clear guidelines on how to teach it and under what subject.”*
- *“Include in the syllabus and train teachers.”*
- *“DRR should be infused into every subject like HIV/AIDS and rigorous campaigns to be made before or after a disaster.”*
- *“All subjects must incorporate concepts of DRR like was done with HIV/AIDS introducing a subject might not work because of lack of time.”*

- One respondent however felt DRR should not be integrated into the curriculum by indicating that, *“As the current Botswana curriculum is overburdened with many subjects it is not suitable for an additional subject of DRR”*.

From the above strategies, it is observed that it is possible to integrate DRR into the curriculum. Respondents also indicated that, to overcome the challenges of lack of skills in DRR teaching, the solution lay in better staff training modalities alluded to for Japan, Cuba, and Georgia which could serve as examples for Botswana.

5.3 Activities suitable for DRR teaching

For effective integration of DRR into the curriculum, respondents proposed a number of activities guided by Experiential Learning (EL) Theory which uses experiences of the children in their everyday lives. Some of the activities used under EL include drills, role playing, hazards identification, community mapping, basic safety habits. Most of the respondents alluded to the following activities:

- *“Frequent drills and visits from people who are experts in DRR”*.
- *“Demonstration, role play and audio visual learning”*.
- *“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”.
- *“Practical application e.g. fire drills etc”*.
- *“Discussions, demonstrations picture presentation and practical work on disasters”*.
- *“Fire drills, propound songs and poems about disaster which is part of the curriculum”*.
“Educator workshops”.
- *“Visual and physical experiences. In standard 6, we did mock earthquake, epidemic and shut down. Kids loved it (refer to EL)”*.
- *“Hands on practical work”*.
- *“Practical work, fire drills and role playing”*.

The above interview results show that there are quite a number of pedagogical initiatives that can be identified and used to promote effective integration of DRR into the curriculum. These are all practical activities which cut across all grade levels in primary schools.

6 Discussion of findings

Results of the study provide a number pointers to nature of efforts being made to attempt to integrate RDD into the curriculum. First results of the study show that teachers in primary schools generally have a positive view about RDD and why it should be integrated into the curriculum. Teachers portray a good understanding of the benefits of integrating RDD to both their students and themselves. Extant literature as well as a number of studies highlight the importance of integrating RDD into the curriculum. In their study on the benefits of integrating RDD into the curriculum, Selby and Kagawa (2012) found that such an effort can lead to education being an instrument in building knowledge, skills, and attitudes in students that are necessary for preparing them to cope with disasters not only in schools but in everyday lives. Having a positive view and attitude by teachers towards the integration of RDD is also confirmed as important by Wisner (2006) who posited that education, knowledge and awareness of RDD are critical to the building of students’

ability to reduce losses from natural events when they do inevitably occur. The importance and benefits of RDD is also acknowledged by the United Nations Convention on Rights of the Child 1990 which recognises that every child has a right to quality life by having access to education and such rights should not be compromised by failure to effectively either reduce or manage disasters whether natural or man-made.

The study also revealed that specific benefits for integrating RDD into the curriculum since this leads to knowledge build-up on both the teachers and students on how to effectively manage disasters should they occur. Among specific benefits of integrating RDD into the curriculum which are highlighted in this study include (i) it helps students learn how to identify and respond to risks in their communities (Wisner 2006; Shaw, 2012; Venton & Venton 2012), (ii) knowledge and skills in managing disasters leads to 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; Wisner 2006), (iii) 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), (iv) school attendance and learning are increased, leading to better success especially for girls (Venton & Venton 2012:12; Campbell & Yates, 2006:10), (v) learners 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) and (vi) students will be able to also act as important information disseminators to everyone in the community relating to DRR and response (Campbell & Yates, 2006:10, Basur & Samet, 2002:194). All these benefits are important both on a short term for safety of students at school and on a long term for them to be able to manage disasters in their communities.

It further emerged in the study that there are a number of challenges that inhibit effective integration of DRR in the curriculum in primary schools. This then means teachers find it difficult to integrate concepts of DRR during teaching. Among some of the challenges highlighted in the study include lack of resources, lack of skills to manage disasters should they happen, lack of policies and direct institutional objectives that guide the current syllabus.

The study also showed that there are a number of strategies and activities that can be used to enhance effective integration of DRR in the school curriculum in primary schools in Botswana. Such strategies and activities include ensuring that DRR is examinable/ tested to instil seriousness in its teaching and learning, clear guidelines on how to teach it and under what subject, providing rigorous training for the implementing staff particularly on the procedures of integrating DRR in the curriculum, and ensuring that all learning areas or subjects incorporate concepts of DRR so that it is taught across disciplines. The importance of the above strategies and activities is also confirmed in both extant literature and past studies. The Hyogo framework as articulated by Kagawa and Selby (2014) argues that promoting 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 is critical for effective managed of disasters in communities. UNESCO (2011) also echoed the same sentiments by arguing that the making disaster risk reduction a 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. These statements therefore, while affirming the importance of integrating DRR in the curriculum, show that such integration should be across curricular domains so that all students are able to benefit from the knowledge and skills taught.

7 Conclusions and recommendations

Based on the above results, a number of conclusion can be made. First, it can be concluded that teachers in primary schools in Botswana have a sound knowledge of what DRR is and believe that it can have benefits for students if it is integrated into the curriculum. Second, integration of DRR into the curriculum is affected by a number of challenges chief among which is lack of resources as well as lack of an implementation plan that provides clear guidance on how the integration can be done. Third, it is concluded that strategies such as robust training of staff on integration procedures, ensuring that DRR is examinable and ensuring that DRR is implemented across curricular areas can among others, enhance effective integration of DRR in the primary schools. Based on the conclusions given, it is therefore recommended that more training on how to effectively implement the integration be done on the implementing staff and also that adequate resources related to the integration process be provided by government and other stakeholders to ensure effective integration of DRR in the primary school curriculum.

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