A MODEL OF LOCAL CONTENT DISASTER-BASED CURRICULUM AT ELEMENTARY SCHOOLS

*Alwen Bentri[1]

[1]Faculty of Education, Universitas Negeri Padang, Indonesia

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ABSTRACT: West Sumatera geographical conditions are prone to natural disasters and earthquakes, resulting in people vulnerable to becoming victims. This is especially true for students, because they do not have the capacity to face earthquake disasters. Therefore, it is important to equip learners systematically and massively on a wide range of knowledge, attitudes/values, and basic skills required by the curriculum in schools in order to minimize the risk of earthquakes. Related to this, the present study was conducted in order to produce a model of local content disaster-based curriculum, especially about earthquakes, for elementary school students. This research was developed by using a conceptual model comprised of several stages: a literature review, a needs analysis, development of the draft, validation/expert tests, revisions, activities of focus group discussions, and finalization of models. The data was obtained from various elements of information that were relevant to earthquakes through questionnaires, the assessment format, and recording of the activities of focus group discussions; these methods were analyzed by using a descriptive qualitative analysis. The results of this development were the formulation of course objectives, competency standards, basic competencies, subject matter, approaches to learning, teaching methods, and types of assessment. These components are interrelated to one another and have clear ideas, are comprehensive, and are positioned to equip students to be functional in the face of an earthquake.

Keywords: Natural disaster, Conceptual model, Risk of earthquake, Disaster prevention

1. INTRODUCTION

Education is a human process that enables us to realize the elevation of human dignity [1]. Education helps children develop optimally, that is, develop the potential and value systems that are needed to live as individuals and as citizens in society. In the development of human resources, priorities and main pillars of national development are developed through the national education system, as outlined explicitly and comprehensively in the Law of the National Education System Number 20 of 2003 [2]. To realize the goal of national education, it must be organized through a certain path and educational units set out in the Law of National Education System. Failure or success in achieving the goals of education is determined by the determinant factors in education, which are educational components. One of the principal components that have a very important position in education is the curriculum. The curriculum is an absolute requirement and is an integral part of education [3].

The current implications of the policy based on regional autonomy are the development of local content curriculum in primary and secondary education for general education, vocational education, and special education. The development of local content curriculum can be done through two approaches: first, to insert directly into each group of subjects; second, a separate subject that specifically contains local content. In this research, the researcher used the second approach. The local content curriculum basically provides the opportunity for students to develop their knowledge and competencies that are appropriate to the circumstances and needs of the environment. This opinion gives meaning to introducing and offering an opportunity to understand learners' environments, which is very important in order to provide them with local wisdom [4].

There are several reasons behind why the development of a local content disaster-based curriculum is needed. First, natural conditions in West Sumatra create disaster-prone areas, such as earthquakes, tsunamis, landslides, floods, and other disasters. West Sumatra is one of the most likely areas to experience earthquakes and tsunamis in Indonesia. The possibility of an earthquake in West Sumatra continues to exist, but scientifically it cannot be predicted when, where, and how the earthquake will happen [5]. This is because the area is located above faults and plates that are very active. Furthermore, the Sumatera area has two seismic risks, namely: (1) one derived from the Indian Ocean, the waters of West Sumatra, which is a regional meeting of the Indo-Australian plate and the Eurasian plate; and (2) coming from the Sumatra fault stretching from Aceh to Lampung is what is popularly known as the watermelon fault. The watermelon fault is a very active fault in the Sumatran mainland that divides the island in two, extending along the Bukit Barisan Mountains from

the Gulf of Watermelon in the Sunda Strait to North Aceh. This region is very susceptible to earthquakes. The earthquake that occurred on September 30th, 2009 was clear evidence that West Sumatra is an earthquake-prone area [6].

Secondly, a strong earthquake and its ensuing damage will have an impact on various things, such as damage to infrastructure, loss of life, unemployment, psychological effects, and more. Approximately 20% to 50% of earthquake victims are affected by a mental disorder triggered by the loss of loved ones, loss of materials, and so on [7]. There will be much damage, loss of materials, and casualties. This shows the lack of readiness of individuals and communities in facing a future disaster.

There are four main factors that influence these conditions, namely: (1) a lack of understanding of the characteristics of the hazard; (2) attitudes and behaviors that lead to a decrease in the quality of natural resources; (3) a lack of information that leads to unpreparedness for disasters; and (4) the inability to mobilize in the face of danger [8]. In addition, research found that students who do not understand earthquakes impacts how they experience earthquakes [9]. Therefore, students in the next generation need to be given disaster education as it has been done and be educated on how to manage disaster education through open and distance education [10]. After the devastating 1999 Kocaeli earthquake in Turkey, some key institutions initiated and developed several disaster preparedness training programs that included basic disaster awareness and awareness of structural and nonstructural earthquake hazard mitigation [11].

Third, earthquakes that have occurred and will occur in West Sumatra are recognized scientifically as a natural phenomenon. There is no science that can accurately predict when an earthquake will occur. Fourth, the Law of the Republic of Indonesia Number 24 of 2007 on Disaster Management explicitly said that the territory of the Republic of Indonesia (NKRI) is prone to disasters and has the geography, geology, hydrology, and demographics that allow disasters caused by natural, non-natural, or human factors [12].

Fifth, the reform movement in Indonesia cannot be separated from the global movement with a key substance of democratization that led to movements from below that wanted a more democratic life and who recognize human rights in all aspects of human life. As a result, at the end of 1997, the concept of centralized management is no longer a place in society that ultimately gave birth to an alternative policy with the enactment of Law Number 22 of 1999 on Regional Autonomy [13].

Clearly, it can be said that autonomous regions shall implement and recognize education, including making changes and adjustments so that this region

can realize a democratic process of education and encourage community participation [14]. The states that are members of mainstream society, local governments, and universities in a particular area are synergistic in accelerating the improvement of the quality of education in that area. Participation is managed and coordinated well in order to be more efficient and more meaningful for regional development in the field of education.

This research produces a model of local content disaster-based curriculum for primary school students. This research is expected to provide benefits theoretically, that is, the development of ideas as well as basic concepts, models, strategies, and meanings in local content disaster-based curriculum.

2. REVIEW OF LITERATURE

2.1 Basic Concept of Curriculum

The evolutionary process that occurs in practice and educational theory has provoked a logical consequence of the different and multivariate meanings of basic conceptions of the curriculum. The curriculum is defined differently by educators, experts, and even authors of educational books [15]. The authors of the curriculum will give a different interpretation about the terms of the curriculum [16]. The conception of the curriculum develops in line with the development of the theory and practice of education and also varies according to the school or educational theory espoused.

2.2 Determinant Factors Toward the Conception and Development of Curriculum

Benchmarks are used as the basis for decision-making and an important policy that essentially gives effect to the conception of curriculum and curriculum development, commonly called the foundation of the curriculum. The foundation forms one's approach as the knowledge that directs the pattern of thought in the formulation, development, and improvement of the curriculum and learning.

Educational philosophy lies at a central point because philosophy can provide the basis and grains of guidelines for making a wise decision. Without a philosophy, an educator may lack guidance when designing, implementing, and improving the quality of education [17]. This statement was perhaps more true in the area of curriculum because in essence, the philosophy and curriculum both want to answer the same question, that is, become what the kids someday?

Psychology deals with how students learn and provides a foundation of thinking about the nature of learning and levels of development of learners. In connection to that, curriculum is essentially

developed so that learners can grow and develop properly. Psychology provides knowledge about human development from childhood to adulthood [18]. In connection with this research, the curriculum that will be developed should refer to and be relevant to the psychological conditions of students who are at the level of primary school education.

A sociological study of the curriculum means the study of the social and cultural. Culture includes all the behavior patterns in society that continue to evolve and are followed by every member of society Such ways of thinking and behaving take the form of customs, traditions, ideas, beliefs, and values, in addition to ideals and expectations. Usually people are either consciously or unconsciously proud of their cultural values, whether concrete or abstract.

Historical information or documents about the school programs of the past that may be preserved should be considered for use until now or there was greater effect in the current curriculum. A figure that encourages historical research on curriculum development [19]. He argues that in the development of philosophical ideas, philosophers continue to reconstruct and criticize the works of the past that continue to grow steadily.

2.3 Model of Curriculum Development

2.3.1 Alternative Models

One of the most classic models suggests four basic questions that must be answered in curriculum development, namely: (1) what educational purposes should the schools seek to attain? (2) What educational experiences can be provided that is likely to attain these purposes? (3) How can these educational experiences be effectively organized? And (4) how can we determine whether these purposes are being attained? [20]

This opinion has several steps that must be considered and carried out in developing a curriculum. It also describes some components that must be included in a curriculum (i.e., purpose, learning experiences, organizing of learning experiences, and evaluation). Furthermore, these components must be arranged systematically so that the effectiveness of a curriculum can be reached [21]. This thought also becomes a reference for curriculum specialists or teachers in developing a curriculum. It also has contributed to growing and developing several alternative models of curriculum development in accordance with the development of the theory, practice, and systems of education that are used. In line with this opinion, several alternative models of curriculum development are based on thinking as mentioned above, namely, the administrative (line staff) model, the grass roots

model, Beauchamp's system, the demonstration model, Taba's inverted model, Roger's interpersonal relations model, the systematic action research model, and the emerging technical model [22].

2.3.2 Centralization to Decentralization

The selection of a model of curriculum development is not only based on the advantages and goodness of that model nor based on the optimum result, but also based on the concept of education and the educational management system used. Curriculum development in an educational system and centralized management emphasizes the uniformity of curriculum documents and its implementation, and is named the administrative model. As described in the previous sections, its development came from the initiative and ideas of education administrators and used administration procedures. Furthermore, the government through its bureaucracy applies that curriculum and orders schools to implement it [22].

Decentralization of education is a delegation of authority from the central to local governments to provide education [23]. It will have an impact on the arrangement of the education system, such as the hosting organization, curriculum, structuring of human resources, financing, management systems, and infrastructure facilities in the regions. Nevertheless, the decentralization of education does not mean to shrink the substance of education to become localized and narrow. It would not make the orientation of education primordial, which may foster regional sentiment. It must still refer to national education goals and continue the efforts to achieve those goals.

Based on the description of the decentralization of education, the curriculum development model that is relevant to the characteristics of educational decentralization is a bottom-up model, named the grass roots model and the demonstration model [24]. As stated earlier, these development models are basically the opposite of the administrative model or linear model. In these models, the initiatives and efforts of curriculum development are not coming from the top but from bottom (i.e., teachers, schools, and local levels).

2.3.2 Local Content Curriculum as the Implementation of Decentralized Education

At the elementary school level, local content curriculum is a package in the development of curriculum for general education that begins in elementary school and continues through high school. The inclusion of local content curriculum is essentially based on the fact that Indonesia has diverse potentials and conditions, such as the

diversity of natural and socio-cultural conditions. That is why the introduction and understanding of these conditions is important to bring in as early as possible through the school curriculum so that learners know and understand their environment. All decisions related to the preparation of the curriculum development are submitted to the educational unit or regions. This is actually the main point of the follow-up or implementation of decentralized educational management. In this system, schools or regions have full authority and responsibility in choosing and deciding the suitable curriculum along with the vision, mission, and aims of the educational unit in order to reach national educational goals.

The presence of local curriculum has a meaning, at least in terms of three dimensions: the content of curriculum, learner's expediency, and curriculum expediency [25]. Judging from the dimensions of the content of curriculum, the presence of local curriculum is an attempt to enable various potentials in areas to become lesson materials.

2.4 Perspective of an Earthquake

2.4.1 Nature and the Earthquake Potential

Indonesia has the potential to experience catastrophic events ranging from the mildest to the most devastating. Law number 24 of 2007 on disaster management explicitly stated that a disaster is an event or series of events that threaten and disrupt lives and livelihood that is caused by both natural factors and non-natural or human factors.

2.4.2 The Impact of an Earthquake

In principle, all forms of disasters always bring the impact of a risk that will be borne by the victim, the community, or the government. In connection with the impact of disasters on human life [26], natural disasters are extreme, sudden events caused by environmental factors that injure people and damage property. Disasters generally cause an adverse impact on all kinds of environments, objects, and life nearby. Furthermore, the economic toll of these disasters is quite large, and while modern technology can mitigate property damage and loss of life, no amount of human effort can eliminate disasters [27].

One of the disasters that resulted in the loss of human lives, environmental damage, loss of property, and a psychological impact was the large-magnitude earthquake accompanied by a tsunami that occurred in Aceh in 2004 [28]. This disaster led to the deaths of hundreds of thousands of people, and approximately 50% of all buildings were damaged. Likewise, the seismic events that occurred in West Sumatra on September 30, 2009—although it did not cause a tsunami—added grief to the public record because it caused thousands of houses to be severely damaged and negatively impacted the lives

of hundreds of people, especially in Padang and Pariaman. Padang has the potential for an earthquake to occur with great ground motion in the near future that will have a high impact on non-engineered structures in Padang [29, 30, and 31]. This potential, that will include great ground shaking in Padang, is similar to Palu City, Indonesia [32, 33, 34, and 35].

2.5 Efforts to Minimize the Impact of Disasters and Mitigation of Earthquakes

The adverse effects of earthquakes as described previously must be taken seriously by all parties through various efforts in the form of policies, programs, and actions so the impact caused by an earthquake can be minimized or even solved with maximum effort. Relating to the impact of an earthquake, anticipating, educating, and informing are the keys to reducing the deadly effects of such natural disasters. A statement stressing the importance of education and information about the disaster is given in order to minimize and mitigate the impact of disasters.

Curriculum-based disasters will make children hold an important role in saving lives and protecting members of society during times when a disaster occurs. The competencies that must exist and need to be developed are: (1) competence before an earthquake and tsunami occurs (preparation); (2) competence during an earthquake and tsunami: (3) competencies required after an earthquake and tsunami. So, related to these thoughts, the findings of this research are focused on these three competencies mentioned previously.

3. RESEARCH METHODOLOGY

The methodology for this study is research and development (R&D) involving research sites in the province of West Sumatra based on geological studies. This province was declared one of the territories of Indonesia positioned at the most vulnerable points and is most susceptible to the threat of earthquakes. The researcher used the techniques of cluster sampling, quota sampling, and purposive sampling. Based on the sampling locations through regional groupings and quotas as stated above, the selected samples of these sites are Kota Padang as representative of the city and Kabupaten 50 Kota as regional or district representatives.

The choice of Padang City and Kabupaten 50 Kota as samples for this research was based on some considerations: the position of regional geologists, the number of elementary school teachers and students, and the mobility of society. The information selected in this study was elementary school teachers, supervisors of primary schools,

section heads of primary school curricula, the heads of education for kindergarten/elementary schools, a team of curriculum developers for primary schools, the board of education, development planning, disaster management agency area, meteorology and Geophysics Padang Panjang, community tsunami alerts, seismologists, education experts, curriculum specialists, religious leaders, and disaster study centers.

Instruments in this research were in a questionnaire and assessment format. In this study, the researcher used a technique for data validity checking such as member-checking, peer debriefing, triangulation, validation or experts testing, and focus group discussions. Techniques of analyzing the data were qualitative and quantitative descriptive analyses.

4. RESULTS AND DISCUSSION

Results of the study appear consecutively in tabular form in accordance with the components of the curriculum that was developed. Then, the final result will be presented for further discussion.

4.1 Course Objectives

The results and final discussion of this research that are related to the course objectives are described as follows:

Table 1 Course Objectives

Early Draft	Results of the Research	
	Quantitative($\overline{X}$)	Qualitative
To provide knowledge, attitudes/values, and skills about earthquakes in order to build self-awareness, the ability to think and to act more wisely, and be able to help oneself and others so that the risks of an earthquake can be minimized.	100%	No revision

The course objectives of local content disaster-based curriculum, especially for earthquakes, that were given to students at elementary schools in this research are to provide knowledge, attitudes/values, and basic skills to students about earthquakes so that the students have the awareness and ability to think and act more wisely and to be able to help themselves and others in order to minimize the risks of an earthquake.

To realize such goals, it is necessary to design the curriculum and learning well and carefully, because the course goals have strategic value to determine a successful implementation of both the learning and the curriculum. The objectives of the curriculum provide general guidelines to achieve the

learning experience that is relevant to the attainment of educational goals. Correspondingly, it is suggested that the purpose of a good curriculum should be implemented in learning so that the students are able to master the competencies required to deal with their needs in the community.

4.2 Competency Standards

The results and final discussion of this research that are related to competency standards are described as follows:

Table 2 Competency Standards

Early Draft	Results of the Research	
	Quantitative ($\overline{X}$)	Qualitative
Having knowledge, attitudes/values, and basic skills regarding preparedness before an earthquake.	84.9%	Revised by adding two competencies. Thus becoming three standards of competence, namely: 1. Save yourself and others when an earthquake disaster occurs; and 2. Engage in practical and normative action after an earthquake disaster.

Competency standards are relevant to promote the goals of the course objectives, which are: (1) to have the knowledge, attitudes, and basic skills regarding preparedness before an earthquake; (2) to have the knowledge, attitudes, and basic skills to rescue themselves and others during an earthquake; (3) to take practical and normative action after an earthquake.

The three competency standards listed above are the formulation of the limits and direction capabilities that must be possessed by learners to perform activities based on the knowledge, attitudes/values, and skills needed to achieve the course objectives. Related with this, the standard of competence is the ability for graduates to possess the subject matter. It confirms that the competency standards are the competencies that should be owned by the students after they follow certain subjects at certain levels.

Competencies such as those contained in the three standards of competence produced in this research will have no meaning for the students' lives if they obtain these competencies separately.

4.3 Basic Competencies

The results and final discussion of this research related to basic competencies are described as

follows:

Table 3 Basic Competencies

| Early Draft | Results of the Research | |
	Quantitative ($\overline{X}$)	Qualitative
1. To explain the purpose, types, and causes of earthquakes. 2. To explain the history of the events of devastating effects of earthquakes in West Sumatra. 3. To identify the impact caused by earthquakes on lives 4. To describe the area and earthquake belt 5. Obeying the command and the government's regulations for safety in an earthquake 6. Take appropriate actions to avoid risks of post-earthquake	80.1%	1. Revised by added competence such as being able to describe the consciousness and self-awareness of earthquakes in order to minimize the risk, and having skills to rescue themselves and others. 2. Adding an attitude aspect of the phenomenon of earthquakes as the providence of God, showing concern for others, and showing patience and trust in God.

Basic competencies that are relevant to promote the course objectives and achievement of competency standards through this research are: (1) to explain the purpose, types, and causes of earthquakes; (2) to explain the history of the events of devastating earthquakes in West Sumatra; (3) to identify the impact of an earthquake; (4) to describe awareness and alertness to an earthquake in order to minimize risks; (5) to skillfully rescue oneself and others as preparation for an earthquake; (6) to show the areas and pathways of earthquakes in West Sumatra; (7) to describe the signs or symptoms of an earthquake-potential tsunami; (8) to comply with the cues and arrangements of the government for personal safety in case of an earthquake and tsunami; (9) to make efforts to rescue oneself and others when an earthquake occurs; (10) to take appropriate action to avoid the risks of post-earthquake situations; (11) to described the earthquake as a natural phenomenon and a destiny from God; (12) to show concern and cooperation in order to help others affected by the disaster; and (13) to show patience and trust in the Lord in response to II an earthquake disaster.

Basic competencies that resulted from this research as outlined above constitute the minimum basic capabilities that must be controlled and displayed by learners. In other words, all the minimum basic capabilities are to support the achievement of competency standards.

4.4 Subject Matter

The results and final discussion of this research that are related to the subject matter are described as follows:

Table 4 Subject Matter

| Early Draft | Results of the Research | |
	Quantitative($\overline{X}$)	Qualitative
1. Definition or meaning of earthquake 2. Types of earthquakes 3. The history of devastating effects of earthquakes in West Sumatra 4. The impact caused by earthquakes on lives 5. Neighborhood setting 6. Equipment and facilities need to be prepared 7. Area and earthquake belt 8. Signs of earthquakes and tsunamis 9. Map and tsunami evacuation route 10. Importance of complying with building codes	83.9%	1. Revised by adding material such as simulating the rescue of self and others as well as how to save oneself and others during an earthquake. 2. Add the understanding that an earthquake is a natural phenomenon, a result of divine providence; build a caring attitude, cooperation and mutual assistance, patience, and resignation to God.

Subject matter that is highly relevant to support the achievement of course objectives, competency standards, and basic competencies produced in this research are: (1) the meaning of earthquakes; (2) the types of earthquakes and their causes; (3) historical events of earthquake damage in West Sumatra; (4) the effects of an earthquake; (5) environmental setting of home/residence; (6) equipment/facilities to be prepared; (7) simulating the rescue of oneself; (8) simulating the rescue of others; (9) the area and line of an earthquake; (10) signs of a potential tsunami; (11) early warnings that are held/made by the government; (12) map and tracking of disaster evacuation; (13) the importance of obeying the rules of building; (14) ways/actions to rescue oneself when an earthquake occurs; (15) ways/actions to be taken for others when an earthquake occurs; (16) actions to take after an earthquake disaster; (17) finding and using the right information; (18) earthquakes as a natural phenomenon; (19) earthquakes as the providence of God; (20) building

a caring attitude; (21) building a sense of cooperation, (22) patience, and (23) trust in the Lord.

The distribution of the subject matter described above contains three domains, namely, cognitive, affective, and psychomotor. These three domains will be owned by the students through learning activities that can further develop into knowledge, which in turn evolves again into the students' experience. The students' learning experience will be developed based on interactions between students and the material in each subject and their environment. This means that the interaction in the learning activities functions as a way to integrate the cognitive, affective, and psychomotor domains until the competencies that are hoped for develop.

4.5 Approaches and Methods of Learning

The results and final discussion of this research that are related to the approaches and methods of learning are described as follows:

Table 5 Approaches and Methods

Early Draft	Results of the Research	
	Quantitative($\overline{X}$)	Qualitative
Approaches: (1) Expository, (2) Active Learning (PAKEM), (3) Contextual Teaching Learning, (4) Cooperation, (5) Communication. Methods: (1) Lecture Method, (2) Questions and Answers, (3) Tasks, (4) Field Study, (5) Discussion, (6) Simulation, (7) Problem Solving, (8) Demonstration, (9) Socio-drama.	94.33%	Revised by adding a method of remembering God (Zikir)

Approaches and methods that are highly relevant and adequate as procedures and ways of working that are used to direct and facilitate learners to master the subject matter, the achievement of basic competencies, competency standards, and objectives of the course produced in this research are: (1) expository; (2) active learning (PAKEM); (3) contextual teaching learning; (4) cooperation; and (5) communication. Associated with the learning methods are: (1) lecture/*tausiya*: (2) question and answer; (3) assignment; (4) field visits; (5) discussion; (6) simulation/training; (7) problem solving; (8) demonstrations; (9) socio-drama; and(10) *zikir* (remember Allah SWT as God).

The approaches to learning described above are to create a learning process that empowers the students' potential. More deeply, the potential of the students must be empowered so they can transform the teaching materials into knowledge.

4.6 Assessment

The results and final discussion of this research that are related to assessment are described as follows:

Table 6 Assessment

Early Draft	Results of the Research	
	Quantitative($\overline{X}$)	Qualitative
(1)Written Tests, (2) The Assignment Sheet, (3) Oral Tests, (4) Attitude Tests, (5) Practices, (6) Reports of Field Study.	100%	No Revisions

Assessments are very relevant to obtain information about the achievements and performance of learners in accordance with the subject matter and the basic competencies that have been produced in this research. Types of assessments include: (1) written tests; (2) assignment sheet; (3) oral test; (4) attitudes test; (5) practice; and (6) reports of the field study. These assessments are the final component of the curriculum model generated from this research.

Assessment has a very important role in curriculum and learning; assessment is an essential component of the curriculum as it gauges: (1) achievement of the objectives; (2) how information was provided to the parties concerned; (3) decision-making; and (4) improvement efforts based on information and evidence gathered.

4. CONCLUSIONS

This development research has produced a local disaster-based curriculum for primary schools, especially for earthquake disasters. This curriculum has several components, namely: the objective of learning, three competency standards that are highly relevant to support the achievement of the objectives, 13 basic competencies, 23 main subjects, ten approaches and learning methods, and six types of assessments. When it is viewed organizationally or in the implementation, these components have a close relationship to each other. In addition, the model has clear ideas, practical values, is comprehensive, and is strategic with equipping and facilitating learners to live their lives more effectively for themselves and others in the face of an earthquake disaster. Thus, the casualties generated as a result of an earthquake disaster can be avoided or minimized.

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