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## **DEVELOPMENT OF A FIRE DISASTER MITIGATION LEARNING MODEL IN EARLY CHILDHOOD EDUCATION IN WETLAND ENVIRONMENT**

### **Abstrak**

Penelitian pengembangan model pembelajaran mitigasi bencana kebakaran dilatarbelakangi oleh banyaknya bencana kebakaran yang terjadi di Banjarmasin dan pembelajaran mitigasi bencana kebakaran yang belum efektif pada PAUD. Pembelajaran mitigasi kebakaran saat ini masih menggunakan metode klasik seperti role-playing, melalui cerita atau gambar sehingga pembelajaran kurang atraktif, kurang realistis, kurang inovatif dan kurang efektif untuk anak usia dini. Pembelajaran mitigasi kebakaran dengan model simulasi merupakan salah satu solusi model pembelajaran yang dapat digunakan oleh guru agar pembelajaran atraktif, realistis, inovatif dan efektif bagi anak usia dini. Metode penelitian yang digunakan yaitu metode Research and Development (R&D) yang dikembangkan oleh Borg and Gall. Penelitian dilaksanakan dalam beberapa tahapan yaitu penelitian dan pengumpulan data (*research and information collecting*), perencanaan (*planning*), pengembangan draf produk (*develop preliminary form of product*), uji coba lapangan awal (*preliminary field testing*), merevisi hasil uji coba (*main product revision*), uji coba lapangan (*main field testing*), penyempurnaan produk hasil uji lapangan (*operasional product revision*), dan uji pelaksanaan lapangan (*operasional field testing*), penyempurnaan produk akhir (*final product revision*), kemudian diseminasi dan implementasi. Hasil penelitian menunjukkan bahwa pembelajaran mitigasi kebakaran pada PAUD di lingkungan lahan basah menggunakan model simulasi dinyatakan valid dan dapat dilaksanakan oleh guru bekerjasama dengan Tim Damkar sehingga keterampilan dan kreativitas guru dalam menerapkan model pembelajaran untuk mitigasi bencana kebakaran meningkat.

**Kata kunci:** Model Pembelajaran, Mitigasi Bencana Kebakaran, PAUD, Lahan Basah

### **Abstract**

The research on developing a fire disaster mitigation learning model was motivated by the large number of fire disasters that occurred in Banjarmasin and the ineffectiveness of fire disaster mitigation learning in Early Childhood Education. Currently, fire mitigation learning still uses classic methods such as role-playing, through stories or pictures, so learning is less attractive, less realistic, less innovative and less effective for young children. Learning fire mitigation using a simulation model is one learning model solution that can be used by teachers to make learning attractive, realistic, innovative and effective for young children. The research method used is the Research and Development (R&D) method developed by Borg and Gall. The research was carried out in several stages, namely research and information collecting, planning, develop a preliminary form of product, preliminary field testing, revising test results (main product revision), main field testing, refinement of products resulting from field tests (operational product revision), field implementation test (operational field testing), completion of the final product (final product revision), then dissemination and implementation. The results of the research show that learning about fire mitigation in Early Childhood Education in a wetland environment using a simulation model is declared valid and can be implemented by teachers in collaboration with the Fire and Rescue Team so that teachers' skills and creativity in applying learning models for fire disaster mitigation increase.

**Keywords:** Learning Model, Fire Disaster Mitigation, Early Childhood Education, Wetlands

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## INTRODUCTION

Education is one thing that is crucial for all children to get, because education is one of the provision that must be owned by every individual to achieve success in his life. The continuity of education for every citizen needs serious attention from various parties, especially the government. The government's roles and responsibilities for the care, education and development of early childhood in Indonesia have been manifested in the form of various policies and agreements both internationally and nationally (Sujiono, 2009. pp 47).

From an empirical perspective, there are many studies that conclude that Early Childhood Education is very important, including according to Clark who explained that at the time humans are born, the completeness of the brain organs contains 100-200 billion brain cells that are ready to be developed and actualized to achieve the highest level of potential development, but research results prove that only 5% of the brain's potential is used. This is due to the lack of stimulation that optimizes brain function (Sujiono, 2009. pp 17).

Learning is essentially a process that regulates the environment around students. So that it can grow and encourage students to carry out learning process activities and so that students can learn well and regularly (Pane & Darwis Dasopang, 2017). Another definition states that learning is a process carried out by teachers to help students learn, between teachers and students exchanging information, how learning can occur in the process of acquiring knowledge, skills and attitudes of students (Sunhaji, 1970).

So far, efforts to improve disaster preparedness capabilities have only focused on adults, while for preschool-aged children, there are still very few. Knowledge about disasters is very important for the public to know, especially for young children who are very vulnerable to becoming victims of disasters, so children need knowledge that can help them, this is supported by people's research (Mutiah, 2010: 5) showing that 75% of knowledge is obtained from observations. Children's knowledge will be obtained through experience from birth. If young children do not have sufficient knowledge, experience and abilities, the impact of disaster events will cause them trauma, stress that affects children's psychology, disaster events that take many victims such as losing parents, disasters that injure them and other impacts. . This also supports the theory put forward by Piaget (Suyadi, 2009:22) that children are able to build knowledge to gain experience through cognitive processes by manipulating the environment. This shows that by teaching fire mitigation lessons directly, it will give children experience that is useful for cognitive development in terms of how, what to do when a disaster occurs and what to do after a disaster occurs. Early childhood learning should receive attention in all aspects of development. Conceptual issues also include the need to more fully recognize that measures of social and emotional development reflect not only children's behaviors, skills and knowledge, but also features of the contexts in which children grow, learn, and play (Jones et al, 2016:25)

This fire mitigation learning activity also requires knowledge and training. The learning process will provide concrete experience, if children are given real experience then this knowledge will stick with the child, because the child will record what is happening around them. This is supported by the opinion of Einon (2015: 44), namely that through mitigation children will learn in various ways, by trying and experiencing or doing something. This activity also presents activities that suit children's characteristics which are supported by the opinion of Ariyanti (2016:56), one of which is that children have a strong sense of curiosity and enthusiasm for many things. Therefore, children must be given knowledge so that their knowledge increases, apart from that, the golden age is during early childhood. At this time, children experience an acceleration in their development during their lifetime which lasts from age zero to 1 year (Fauziddin, 2018: 223). This is also supported by the opinion of Suhardjo (2011: 176), children are also able to remember routes or road markers, this statement supports the importance of disaster mitigation education which can be introduced and taught to young children to prevent and minimize the potential impact of future disasters so that mitigation programs are needed, for example fire disaster mitigation. Mitigation is an effort to prevent or minimize the potential impact of a disaster event. Disaster preparedness is very helpful in reducing the number of victims due to the impact of an incoming disaster.

Therefore, from an early age children must be prepared to face disasters that will occur in the future. Children can be involved in supporting families in community preparedness and recovery. Children who can bounce back after adversity have more resources within themselves, their families and society (Osofsky & Reuther, 2013).

In 2019 the Ministry of Education and Culture requires all levels of education to have special lessons regarding disaster preparedness. Because based on research results, Indonesia has a high level of natural disaster proneness, among them is fire disaster. Fires in Indonesia occurred in many areas, including in Banjarmasin. As of the third trimester of 2022, there have been 78 fires in Banjarmasin spread across five sub-districts. This disaster has increased quite a lot compared to 2021, when there were only 54 fires. The West Banjarmasin District area has the most fires. Meanwhile, in 2022, based on data collected until September, the area where the most fires occurred was in South Banjarmasin District, with 16 fires.

There are many things that trigger fires in Banjarmasin, the most dominant are electrical short circuits and human negligence (exploding gas cylinders, mosquito repellent, smoking near fuel, etc.). On the other hand, this is also supported by the dense residential areas in Banjarmasin. The following is data on residential fires in 2021 based on data from the South Kalimantan Province Regional Disaster Management Agency as of September 14 2022.

Table 1. Residential Fire Data for 2021

Frequency of Occurrence	36
Affected - Family	152
Affected - Soul	510
Residential Damage - RT	49
Residential Damage - RB	53
Residential Damage - RS	22
Residential Damage - RR	12
Infrastructure - Roads	0
Infrastructure - Bridges	0
Infrastructure - Worship Facilities	1
Infrastructure - School	1
Estimated Losses	Rp 3.551.900.000

Apart from residential fires, South Kalimantan province is also prone to land and forest fires. The following is data on the number and area of forest and land fires in 2021 based on data from the South Kalimantan Provincial Forestry Service.

Table 2. Data on Land and Forest Fires for 2021

In Region (Amount)	25
Within the Area (Wide)	158
Outside Region (Amount)	178
Outside Area (Wide)	1532
Total (Amount)	203
Total (Wide)	361

Due to the large potential for fire disasters that occur in Banjarmasin, it is important to carry out fire mitigation studies early to minimize the impact of fires that occur in the area. According to Law Number 24 of 2007, mitigation is a series of efforts to reduce disaster risks, both through physical development and awareness and increasing capacity to face disaster threats.

According to coverage of mitigation implementation in several areas on Java, fire mitigation in early childhood education collaborates with the local fire department or the Fire and Rescue Service. The school brings the children to the fire brigade or the fire brigade comes to the school with a fire engine and its equipment. The fire department provided information regarding the cause of the fire and how to deal with it, then provided a simulation of a small fire incident which was then extinguished with the fire extinguisher's equipment.

In Banjarmasin, implementation of fire mitigation like this is still very rare. Based on initial studies in several kindergartens in Banjarmasin, fire mitigation is still provided using classical methods, for example role playing. Children are introduced to fires through pictures and stories, but are not given direct experience or simulations in dealing with fire disasters. This method is considered safe because children do not need to come into direct contact with fire.

In an effort to maximize learning activities in early childhood, an attractive, innovative, realistic and effective learning models are needed. The learning model is a form of learning that is depicted from beginning to end, which is presented specifically by the teacher. In other words, a learning model is a wrapper or frame for the application of a learning approach, method, strategy and technique (Helmiati, 2012). In this research, a fire disaster mitigation model was developed in Early Childhood Education. This is an important and fundamental action which is not only an action for developing learning, but also a preventive action for the lives of every child in facing this phenomenon in the future, so that when facing real events every child has optimal readiness to face it (Cinantya et al, 2021).

Through this research, teachers are introduced to a more attractive learning model for children so that learning will be realistic, innovative, fun and effective. With this research, researchers hope to increase teacher creativity in implementing lessons about fire mitigation to students. Researchers will collaborate with schools and the Fire and Rescue Service to implement fire simulations. Fire mitigation with this model is expected to be effective because of the direct experience through simulations that children get in dealing with fires. The need for collaboration with the Dinas Pemadam Kebakaran dan Penyelamatan (Fire and Rescue Department), apart from direct experience for teachers in implementing this model in schools which leads to children's success in responding to fire disasters, is also to increase safety when the fire simulation process is carried out.

## METHODS

The type of research used in this research is Research & Development (R&D). Research & Development is used primarily to bridge the gap between educational practice and research (Sugiyono, 2016: 297). Research and development is different from ordinary research which only produces suggestions for improvements, research and development produces products that can be used immediately. So, it can be concluded that development research is a research method to produce a product or to improve an existing product.

This research carried out at TK Mawaddah, Central Banjarmasin District, Banjarmasin City, South Kalimantan. Respondents in this research were school principals, teachers and children in Group B. Data collection techniques used were questionnaires, interviews and observation. Interviews are used to obtain initial data for analysis of product needs being developed, while questionnaires are used for teachers' responses. The observation sheet is used to see the implementation of learning using the fire disaster mitigation model.

In general, the R&D model has been developed by several experts, one of which is the model developed by Borg and Gall who developed the R&D model through several stages. The stages in this research and development adopt the Borg and Gall model, which consists of ten steps for implementing research and development strategies, including (Sugiyono, 2016):

1. Research and information collecting, which includes measuring needs, literature studies, small-scale research, and considerations in terms of value.
2. Planning, namely preparing a research plan which includes the abilities needed to carry out the research, formulation of the objectives to be achieved with the research, research design or steps, the possibility of testing within a limited scope.
3. Develop a preliminary form of product, namely the development of learning materials, learning processes and evaluation instruments.
4. Preliminary field testing. Field trials with 3 to 8 test subjects (teachers). During the trial, researchers conducted observations, interviews and distributed questionnaires.
5. Revising test results (main product revision), namely correcting or perfecting test results.
6. Main field testing, namely conducting wider trials with 10 to 20 test subjects. During field trials, researchers collect quantitative data on teacher performance before and after using the model being tested, then the results of the data collection are evaluated and if possible compared with a comparison group.

7. Refinement of products resulting from field tests (operational product revision), namely perfecting products resulting from field tests
8. Field implementation test (operational field testing). Testing is carried out through questionnaires, interviews and observations and then the results are analyzed.
9. Completion of the final product (final product revision). Refinements are based on input from field implementation tests.
10. Dissemination and Implementation, namely reporting the results in professional meetings in journals, collaborating with publishers for publication and monitoring dissemination for quality control.

The design of this research stage can be seen in the chart below:

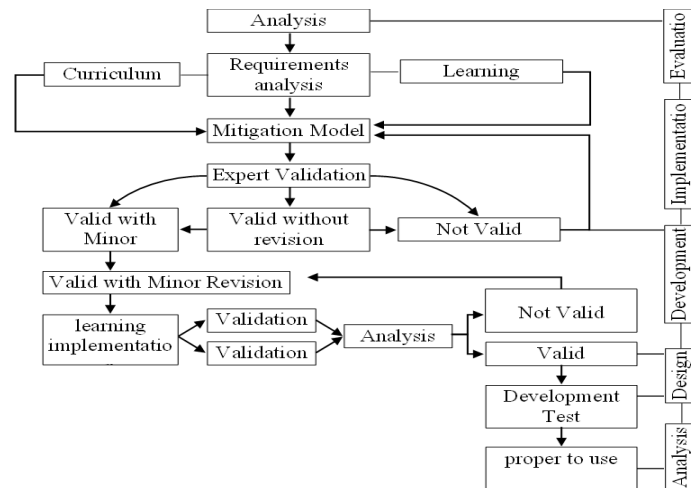


Figure 1. Research Stage Design

## RESULTS AND DISCUSSION

This research developed a fire disaster mitigation learning model in Early Childhood Education in a wetland environment to help teachers in learning in Early Childhood Education so that it becomes more interesting and interactive. This learning model is very important for introducing the concept of fire mitigation to young children in the environment around wetlands. Therefore, researchers develop learning models that are attractive, realistic, innovative and creative. The research was carried out in a wetland environment, precisely at TK Mawaddah, Central Banjarmasin using the R&D model developed by Borg and Gall.

### 1. Research and information collecting

The analysis stage is the initial stage carried out before developing a fire mitigation learning model. Based on the results of observations and interviews conducted by researchers at TK Mawaddah, Central Banjarmasin, there are several things that have become the basis for developing a Fire Mitigation Learning Model in Early Childhood Education in a Wetland Environment:

#### a. Identify Potential and Problems

Based on observations made at the TK Mawaddah as early childhood education institution, teachers have already introduced the problem of fire mitigation to students. However, teachers still use models that are less effective, such as telling stories, which make children unable to imagine what fire mitigation is. So, a more attractive, realistic, innovative and creative learning model is needed for young children.

#### b. Needs Analysis

At the needs analysis stage, fire extinguisher and Pump Truck are needed:

##### 1) Fire extinguisher

A fire extinguisher or what Indonesians usually call as Alat Pemadam Api Ringan, which is usually abbreviated as APAR, is an active fire protection tool used to extinguish fires or control small fires in emergency situations. This tool is shown and explained to the child so that the child can see firsthand how to use the tool and the child is given the knowledge not to use the tool just anywhere.

##### 2) Fire Truck

A fire car or Fire Truck is the result of a series of various system units consisting of Engine, Chassis, Pump and PTO (Power Take Off). The entire system unit is assembled into a single fire engine that is adapted to the required needs.

Fire engines have many different forms and functions. If you look at the shape of the fire engines, they are divided into 2, namely light fire engines and large fire engines. The fire engine that is called the school is a pump truck which is generally small in size and has the function of carrying a pump, but this type of fire engine carries not too much water.

c. Objective and Content Analysis

Making this fire mitigation learning model has objectives and learning material content. The aim of the model is to develop a fire disaster mitigation learning model for children and teachers.

2. Planning

The learning model planning stage in this model is based on the needs analysis stage that was carried out previously. Planning is a series of systematic action plans to improve what is about to happen.

3. Develop a preliminary form of product

The development stage is an implementation stage that refers to a previously created manuscript. At this stage, a lesson plan was prepared with a simulation model to mitigate fire disasters in early childhood education in a wetland environment in learning activities at school.

4. Preliminary field testing.

This research was tested by teachers in collaboration with the Fire Brigade team on Kindergarten B children by introducing a light fire extinguisher and several safety equipment for fire mitigation brought by the Fire Brigade team, then analyzed and evaluated to improve the product.

5. Revising test results (main product revision)

Revisions to products that have been provided with input and suggestions are then made to improve and complete deficiencies in the model for further testing.

6. Main field testing

After revisions were made, the product developed was tested at a larger stage, namely a field test/large scale test, namely by teachers and the firefighting team by bringing larger extinguishers such as truck pumps to Kindergarten A and B children. After that, they were analyzed and the results were assessed.

7. Refinement of products resulting from field tests (operational product revision)

At this stage the product is revised after the results of field tests that have been carried out. The revision aims to review the implementation of the learning model being tested so that it can be continued to the field implementation test stage.

8. Field implementation test (operational field testing)

This stage is carried out through distributing questionnaires, interviews and observations, then the results are analyzed.

9. Completion of the final product (final product revision)

Questionnaires and interviews were distributed to 17 Kindergarten A and B teachers at Mawaddah Kindergarten Banjarmasin after the trial. The following are the results of the questionnaire from the 17 respondents above:

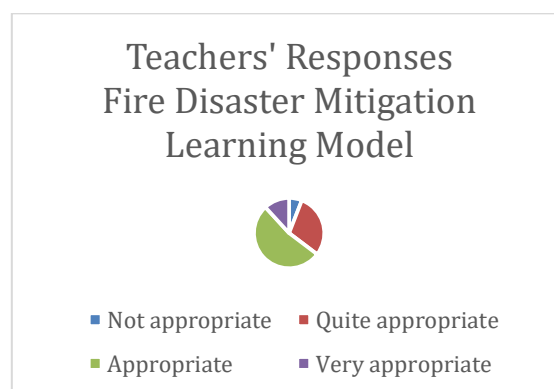


Figure 2. Teachers' Responses Questionnaire Results

Based on the results of the questionnaire distribution, 1 respondent (5.9%) stated that the implementation of the learning model was not appropriate, 5 respondents (29.4%) stated that it was quite appropriate, 9 respondents (52.9%) stated that it was appropriate, and 2 respondents (11.8%) stated that it is very appropriate. Based on the results of the questionnaire, it was concluded that learning about fire mitigation in Early Childhood Education in a wetland environment using a simulation model was declared valid and could be implemented by teachers in collaboration with the fire team so that teachers' skills and creativity in applying learning models for fire disaster mitigation increased.

Based on the results of the interview, there are several inputs from teachers, including the addition of media that is exposed to children during the introduction of learning models for fire disaster mitigation, implementation can also be carried out by carry out field trips, which is children and teachers visiting the location of the fire team, and the evaluation tools should be added so that it can enrich the categories for assessing children's developmental achievements.

#### 10. Dissemination and Implementation

The results of the research were printed in a book which was distributed to PPG Pra-Jabatan students at Lambung Mangkurat University.

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### CONCLUSION

Learning fire mitigation using a simulation model is one learning model solution that can be used by teachers to make learning attractive, realistic, innovative and effective for young children. The research method used is the Research and Development (R&D) method developed by Borg and Gall. The research was carried out in several stages, namely research and information collecting, planning, develop a preliminary form of product, preliminary field testing, revising test results (main product revision), main field testing, refinement of products resulting from field tests (operational product revision), field implementation test (operational field testing), completion of the final product (final product revision), then dissemination and implementation.

Based on the research results, it can be concluded that learning about fire mitigation in Early Childhood Education in a wetland environment using a simulation model is declared valid and can be implemented by teachers in collaboration with the fire team so that teachers' skills and creativity in applying learning models for fire disaster mitigation increase. There are also several inputs from teachers, including the addition of media that is exposed to children during the introduction of learning models for fire disaster mitigation, implementation can also be carried out by means of field trips, namely children and teachers visiting the location of the fire team, and evaluation tools to be added so that it can enrich the categories for assessing children's developmental achievements.

Suggestions for further research are the development of textbooks or learning media that can support the implementation of fire disaster mitigation learning in Early Childhood Education in wetland environments.

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