Revitalization of Traditional Games as a Tool for Contextual Education on Disasters (Case Study: Mount Krakatau)

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Abstract. Disaster education for children as part of disaster mitigation needs to be done from an early age. This process can be done in different ways and with different mediums, one of which is educational games. Through this medium, information on geological characteristics, disaster effects, and other complex disaster-related information can be condensed so children can understand it easily. Also, the use of game-based learning media can improve the quality of learning experience to make it more enjoyable. One potential solution is to revitalize traditional game designs. Traditional games have been used to pass on certain skills, knowledge, and values to children. Hypothetically, this revitalization has several advantages; 1) traditional games have a simple play system so that they are easy for children to learn and can also be easily modified by designers; 2) have cultural and sentimental values for parents; 3) use of local identities can help distinguish Geosite Krakatau from others in a national or global context; 4) Indonesia has many traditional games that can be developed into a variety of new and contextual designs rooted on locality.

This research aims to revitalize traditional games as a disaster-related educational medium for children, especially those related to the Anak Krakatau. So far, the research process conducted in 2 stages, 1) Data collection (recent studies on the Krakatau and various types of traditional games in the Lampung area); 2) Design process (using the ATUMICS tradition revita lization method) and making mock-ups. The design proposed is proof of concept that the use of the traditional game in disaster-related education can be both beneficial in terms of education and cultural preservation.

Keywords : education tools, traditional games, disaster education, krakatau

1. Disaster Education for children
Preparedness on disaster can save lives, reduce injuries and avoid property and vital infrastructure damage, allowing communities to recover faster [1]. Disaster education, including disaster risk education, prevention and preparedness, is one way to minimize the negative impact of disasters [2].

On Hyogo Framework for Action 2005-2015 [3] stated that the goal of disaster education is to develop a culture of safety and resilience at all levels in attempt to lessen the negative economic and social effect of disasters. It aims to provide knowledge among individuals and groups to take actions to reduce their vulnerability to disasters. So that people can raise awareness of disaster risks, acquire the knowledge necessary, and develop the appropriate behavior, attitudes and level of involvement.

Disaster education for vulnerable people (women, children, the elderly, people with disabilities) is particularly important. Schools and communities have an important role in disaster education for children. But in reality, they generally have limited disaster education opportunities and knowledge [4].
2. Lampung traditional toys and games

There are more than 60 kinds of traditional toys/games gathered from various sources (blogs, news, personal websites, government websites, etc.), but many of them are lack in explanation. Though games that has high commonalities with other games in different region has sufficient description, many unique games don’t.

At least 15 kinds of Lampung traditional toys/games archived and well described on Museum Lampung such as, “Patok lele”, “Hahantuan”, “Sundung khulah”, “Ketekhan”, “Setayakhan sinjang”, “Bedil locok”, “Dentuman lamban”, “Kucing buta”, “Arul”, “Peti’an”, “Panahan”, “Ula”, “Kakebau”, “Kuda deri”, and “Enggran” [5].

Many of the traditional games are similar to traditional toys/games in other region in Indonesia. For example “enggran” or called “egrang” in other region in Indonesia, and even has similarities with game called “stilts” in other countries. Some games have a slight variation such as “dentuman lamban” that is similar to game known as “congklak” in several region in Indonesia, “congkak” in Malaysia, or internationally categorized as “south asian mancala”. The difference are, in dentuman lamban there are only 5 holes (instead of 7) and using drawing in the sand as the board instead of wooden board.

Lampung traditional toys/games mostly using local and natural material (woods, bamboo, rubber seeds, coconut leaf or nut, sea shells, etc.). It is probably influenced by Lampung environmental charasteristics which have many beaches and vast rubber plantation.

3. Revitalizing Lampung traditional toys and games

3.1 Method

ATUMICS method developed by Adhi Nugraha is an attempt to revitalized and contextualized a traditional designs, concepts, values, etc. into today’s context [5].

![ATUMICS method](image)

**Figure 1.** ATUMICS method [6]

In this research, ATUMICS method used to break down traditional games into several elements (Artefact, Technique, Utility, Material, Icon, Concept, and Shape) to understand it better. These elements then combined with new elements to develop a new educational games that teach children about disaster caused by Anak Krakatau.

Fauziah & An Nu7 [2] hypothesize that redesigning traditional games has several advantages such as, 1) familiar for most people, 2) easy to be understand and to developed by designers, since traditional games usually has a simple gameplay, 3) has sentimental value for the older generation, 4) each region has their own traditional
toys/games, by taking this into consideration, it means we can create many alternatives and designs that distinct to each region (locality).

3.2 Redesigning Lampung traditional toys and games
In the redesign of educational toys/games, we first need to select and limit which information to teach children. So that the alternative concepts for educational game can be generated easier. After that, we chose which traditional game could be developed as the basis for a new design.

On 22 Dec 2018, a sector collapse event occurred at Anak Krakatau volcano in the Sunda Strait, triggering a deadly tsunami, and caused over 430 fatalities, injured 14,000 people, and displaced 33,000 more along the Sunda Strait [8]. This case was used as the main theme for the educational game in this study. Setyakhan Sinjang and Kakebau games then chosen to be redesigned using ATUMICS method. These 2 games chosen because both has similar characteristic with landslide (flank collapse) and vulcanic activity, which represent instability.

Figure 2. Illustration of Setayakhan Sinjang Gameplay

*Setayakhan Sinjang* is a game of throwing sarong which is usually done at night by boys aged 7-15 years. How to play *Setayakhan Sinjang* can be seen in the Figure 2. At start, players form 2 groups and make a circle. Representative player then do a paper-rock-scissor, and the winning group sits on the shoulders of the losing group. The player above will throw the rolled sarong to the next player and pass it again to the next player continuously. The player on the bottom will shake the player above to prevent them from successfully throwing or catching the sarong. If the sarong falls to the ground, the players will change positions and repeat the game from the beginning [5].
Figure 3. Kakebau traditional games [5], and illustration of Kakebau gameplay

*Kakebau* means buffalo or buffalo-like game. This game is usually played by boys aged 8-14 years. Children used a pull toys made from dried coconut fronds, coconut shell (as a buffalo horn) and rope. The players each hold a “buffalo pull toy” rope and pulled it 3 times back and forth from the starting to the finish line. If the toy capsized, the player is considered lose and get punished to crawl like a buffalo and be ridden by the winner around the play area [5].

### 3.3 Kakebau redesign

*Figure 4.* shown how ATUMICS method used to break down traditional toy/game elements and then combining with new elements to revitalize and re-contextualize the design. In this research, the new added elements in Icon and Shape related to Anak Krakatau and disaster-related information such as flank collapse that cause of 2018 Sunda Strait tsunami. While the Technique elements interpreted as Gameplay, and Concept elements contain new purpose of the redesigned games which are as a disaster education media.
**Figure 4.** Using ATUMICS method to break down traditional toy/game elements and combining with new elements to revitalize and re-contextualize the design. Left, “Setaykhan Sinjiang” redesign, and right, “Kakebau” redesign.
The first game represents Anak Krakatau flank collapse caused by eruption. The collapsing process transformed into block stacking/balancing where players need to prevent “the collapse” from happening. The stacking blocks also represent *Setayakhan Sinjang* where balance is the core gameplay.

The second game aims to teach children about Anak Krakatau island activity and also introduce them to *kakebau*. The card randomizer also used to represent geological phenomenon that can happen in volcanic island (such as Anak Krakatau). Thus by playing this game, children can familiarize themselves with Anak Krakatau geological phenomenon, disaster-related risk, and also the *kakebau* traditional game.
4. Conclusion
It is possible to redesign traditional game and recontextualize it as disaster-related educational toys/games. The 2 proposed tabletop game designs from this research aim to teach children about 2018 tsunami event in Sunda Strait, and Anak Krakatau vulcanic island characteristics. Though how much the new design preserve it’s traditional elements, how user perceive it’s “traditionality” and how effective it is as an educational tools has not been tested yet.

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