

PAPER • OPEN ACCESS

## Preface

To cite this article: 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **676** 011001

View the [article online](#) for updates and enhancements.

You may also like

- [PREFACE](#)
- [IAEA/WHO International Conference on Low Doses of Ionizing Radiation: Biological Effects and Regulatory Control, Seville, Spain, 17-21 November 1997 \(IAEA-CN-67\)](#)  
Richard Wakeford and E Janet Tawn
- [Preface](#)  
John Inglesfield



The Electrochemical Society  
Advancing solid state & electrochemical science & technology

## 241st ECS Meeting

May 29 – June 2, 2022 Vancouver • BC • Canada

Extended abstract submission deadline: Dec 17, 2021

Connect. Engage. Champion. Empower. Accelerate.  
**Move science forward**



**Submit your abstract**



## • Preface

We are delighted that we can introduce the proceeding of the 2<sup>nd</sup> EPI International Conference on Science and Engineering (EICSE2018). The conference is an annual international conference held by Center of Technology (COT), Faculty of Engineering, Hasanuddin University. The conference is one of the activities conducted to commemorate the anniversary of Faculty of Engineering, Universitas Hasanuddin annually. The main aim of the conference is to strengthen research collaborations based on what so-called “triple helix” which consists of university, industry and government (UIG). Therefore, the adopted theme of the year 2018 conference is “Strengthening UIG-Based Collaborations in Anticipating the era of Industry Disruption 4.0.”

The conference is also supported by Japan International Cooperation Agency (JICA) through C-BEST (Capacity Building in Engineering, Science and Technology) project. This year conference has also been certified by the Japanese embassy in Indonesia as part of activities commemorating 60 years of Indonesia-Japan relationship.

We would like to express our appreciation to all authors for their manuscript’s contribution and also to other participants of the conference. We also thank all other parties including our university and our faculty leaders and staff for their support on conference organization and other matters.

On behalf of the EICSE2018 Committee,  
Conference Chair

Dr. Faisal Mahmuddin

## • Conference photographs





- **Editors**

- Dr. Faisal Mahmuddin
- Dr. Muhammad Anshar
- Dr. Intan Areni

PAPER • OPEN ACCESS

## Peer review statement

To cite this article: 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **676** 011003

View the [article online](#) for updates and enhancements.

You may also like

- [Peer review declaration](#)
- [Peer review declaration](#)
- [Peer review declaration](#)



The Electrochemical Society  
Advancing solid state & electrochemical science & technology

## 241st ECS Meeting

May 29 – June 2, 2022 Vancouver • BC • Canada

Extended abstract submission deadline: Dec 17, 2021

Connect. Engage. Champion. Empower. Accelerate.  
**Move science forward**



**Submit your abstract**



## Peer review statement

All papers published in this volume of *IOP Conference Series: Materials Science and Engineering* have been peer reviewed through processes administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.



PAPER • OPEN ACCESS

## Conference Committee

To cite this article: 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **676** 011002

View the [article online](#) for updates and enhancements.

You may also like

- [Committees](#)
- [Organizing Committee](#)
- [Organizing Committee](#)



The Electrochemical Society  
Advancing solid state & electrochemical science & technology

## 241st ECS Meeting

May 29 – June 2, 2022 Vancouver • BC • Canada

Extended abstract submission deadline: Dec 17, 2021

Connect. Engage. Champion. Empower. Accelerate.  
**Move science forward**



**Submit your abstract**



## Conference Committee

### ➤ International Scientific Committee (ISC)

- Prof. Yoshihiro Narito, Hokkaido University (Japan)
- Prof. Shinya Honda, Hokkaido University (Japan)
- Prof. Katsuhiko Sasaki, Hokkaido University (Japan)
- Prof. Jun Ando, Kyushu University (Japan)
- Prof. Shigeru Kashiara, Nara Institute of Science and Technology (Japan)
- Prof. Akio Miyara, Saga University (Japan)
- Prof. Tsubasa Otake, Hokkaido University (Japan)
- Prof. Hideaki Yasuhara, Ehime University (Japan)
- Prof. Masao Furusho, Kobe University (Japan)
- Prof. Satrio Soemantri Brodjonegoro, Institut Teknologi Bandung (Indonesia)
- Prof. Herman Parung, Hasanuddin University (Indonesia)
- Prof. Dato Nor Aieni binti Haji Mokhtar, University Malaysia Terengganu (Malaysia)
- Prof. Wan Mohd Norsani Bin Wan Nik, University Malaysia Terengganu (Malaysia)
- Prof. Ahmad Fitriadhy, University Malaysia Terengganu (Malaysia)
- Prof. Nasaruddin Salam, Hasanuddin University (Indonesia)
- Prof. Imran Umar, Hasanuddin University (Indonesia)
- Prof. Ramli Rahim, Hasanuddin University (Indonesia)
- Prof. Slamet Trisutomo, Hasanuddin University (Indonesia)

### ➤ Organizing Committee (OC)

- Steering board :
  - Dr. Ir. Muhammad Arsyad Thaha, MT.
  - Prof. Baharuddin Hamzah, ST., M.Arch., Ph.D.
  - Dr. Eng. Muhammad Rusman, ST., MT.
  - Mukti Ali, ST., MT., Ph.D.
- Coordinator : Dr. Eng. Nasruddin ST., MT.
- Chair : Dr.Eng. Faisal Mahmuddin, ST., M.Inf.Tech., M.Eng
- Secretary : Muhammad Zubair Muis Alie ST., MT., Ph.D
- Treasurer : Nurfitriani Seilah, ST.
- Members :
  - Dr. Eng. Ir. Muhammad Ramli, ST., MT.
  - Ir. Syerly Klara, MT.
  - Dr. Eng. Intan Sari Areni, ST., MT
  - Dr. Indar Chaerah Gunadin, ST., MT.
  - Dr. Eng. Purwanto, ST., MT.
  - Dr. Eng. Muralia Hustim, ST., MT.
  - Siti Hijraini Nur, ST., MT.
  - Dr. Eng. Abd. Mufti Radja, ST., MT.
  - Hamzah, ST., MT.
  - Ir. Zaenab, MT.
  - Dr. Eng. Ilham Alimuddin, ST., M.ArcGIS
  - Dr. Eng. Amil Ahmad Ilham, ST., MT
  - Dr. Ir. Zuryati Djafar, MT.
  - Dr. Eng. Muh. Anshar, ST., MT.



- Dr. Eng. Ulva Ria Irvan, MT.
- Dr. Ir. Rosmalina Hanafi, M.Eng.
  - Sabaruddin Rahman, ST., MT, P.h.D
  - Dr. Eng. Achmad Yasir Baeda, ST., MT.
  - Amos Datu Bala, S.Kom.
  - Jumadil, ST., M.M.
  - Herawati, S.Sos
  - Susanti Alwi, S.Sos
  - Jayadi, S.Sos
  - Syamsir Alam, SKM
  - Hasrawati, SE.
  - Supriani, ST.
  - Baharuddin
  - Kaharuddin
  - Samsuddin
  - Dirman Abdillah, S.Pd, BASc
  - Juliana Palambean, A.Md

PAPER • OPEN ACCESS

## Designing Board Games to Foster Tolerance

To cite this article: M H Suprpto *et al* 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **676** 012013

View the [article online](#) for updates and enhancements.

# Designing Board Games to Foster Tolerance

M H Suprpto<sup>1\*</sup>, L P S Hartanti<sup>2</sup> and R Latumahina<sup>3</sup>

<sup>1</sup> Faculty of Psychology, Pelita Harapan University Surabaya, Indonesia

<sup>2</sup> Faculty of Engineering Pelita Harapan University Surabaya, Indonesia

<sup>3</sup> Faculty of Law, Pelita Harapan University Surabaya, Indonesia

\*Email: maria.suprpto@uph.edu

**Abstract.** Today, tolerance for diversity in society begins to erode. The low tolerance can threaten the integrity and unity of the Unitary Republic of Indonesia (NKRI). Tolerance towards diversity should be inculcated since childhood. One way to develop tolerance in children is to use the playing method. This study aimed to develop children's play equipment that can increase children's tolerance for diversity in society. One type of children's play equipment is board games. This board game is expected to educate children to be more tolerant of various differences in society such as: ethnicity, race, religion, and class. This increase in tolerance will support the unity and unity of the Indonesian people. The method used to design this board game was a creative method. Data collection was done by conducting surveys, observations, and literature searches. Audience target characteristics are children aged 6-10 years and live in big cities in Java such as: Jakarta, Bandung, Surabaya, and Semarang.

## 1. Introduction

Indonesia has a very diverse population in terms of ethnicity, religion, race and class. Existing diversity is the wealth and characteristics of the Indonesian Nation which is famous for its motto "Bhinneka Tunggal Ika". Awareness and tolerance of diversity in society is a key factor for the establishment of harmony and unity in Indonesia.

Nowadays, tolerance for diversity begins to erode. One example of a trigger erosion of tolerance was a conflict election in Jakarta in April 2017 [1]. Children who did not have the right to vote in political activities could be affected by the attitude of their parents. Understanding of children who had not been well formed makes children unable to filter good things and bad things from political activities. The negative impact was that children could lack tolerance. Children tended to choose friends based on similarities possessed such as: tribe, social class, religion, or race. The younger generation no longer understood the importance of maintaining tolerance with a diverse and diverse society. Lack of tolerance can be a serious problem and a threat to the integrity of the Republic of Indonesia.

Childhood is a golden age to form children who have noble character and personality. Young children who are tolerant are expected to be a strong and peaceful young generation so that they are able to maintain the unity and integrity of the nation. Tolerance towards diversity should be inculcated since childhood. Children have an ethnic identity at the age of 3 years [2], even children who are 5 years old have been able to express their racial attitudes and bias in assessing people who are different from them (race, ethnicity, religion, or social class) [3-5].

One way to develop tolerance in children is to use the playing method. Children love games. Games are a powerful way to develop children's social and emotional abilities [6]. The game can



provide stimulation to develop language skills and problem-solving skills [7]. The game has been widely used in various contexts to develop insight, empathy, prosocial skills and improve children's positive behavior [8]. This game can be a means to overcome prejudice and increase tolerance among diverse communities. This study aims to develop a game prototype that can increase children's tolerance for the diversity of the communities around them.

## 2. Methods

### 2.1. Design methods

The research method used in designing this game was a creative method. Data collection techniques carried out was observation, interviews, and literature search.

#### 2.1.1 Observation.

Observation aimed to find an overview of board games suitable for children aged 6-10 years. Observations were carried out in the board game café and or shop, namely at Toys Toys, Surabaya; Games on Café, Jakarta; and Dakon Library, Jogjakarta. Boardgame cafe rented a variety of board games and provides a variety of food and drinks. Observations are carried out by observing existing games. Dakon (Dolanan Karo Konco) Library is a boardgame library founded by a community of board game players and board game makers called Dakon.

#### 2.1.2 Interview.

The interview aimed to explore the method of making board games, and tips on making board games. The interview subjects were two game designers, who had made board games.

#### 2.1.3 Literature search.

Literature search was used to gather information about children's cognitive development, ways to develop tolerance, and board game design methods. Literature search was done by reading and composing theories from the materials that have been collected.

### 2.2 Audience target characteristics

The specifications of the target audience segmentation were as follows:

#### 2.2.1 Demographic. primary target:

- Children: 6-10 years old
- Gender: unisex (female and male)
- Education: Elementary school
- Social class: middle-up
- Various ethnic, religious and racial backgrounds

#### 2.2.2 Psychographic

- Audience has high curiosity.
- Audience likes challenging games.
- Audience likes to play in groups'.

2.2.3 *Geographical.* Audience lives in big cities in Java such as: Jakarta, Bandung, Surabaya and Semarang.

2.2.4 *Secondary target.* The secondary target of this game was parents of children aged 6-10 years and teachers who taught in class I-IV elementary school, as well as gamers.

### 2.3. *Unique selling point*

Board games can be used to educate children about how to show tolerance to others. This game had content in the form of everyday situations, namely situations in the family, at school, and in the neighborhood around the house, which invited children to be tolerant of others. The game was equipped with questions about Citizenship Education material, especially the material on Pancasila, unity in diversity, tolerance and mutual cooperation. These questions were packaged in the form of challenges so that they can help children to play while learning Civics Education subject matter.

## 3. Design Concepts

The main concept in the design of this board game was to design game products to increase children's tolerance for diversity. This board game can be used as an interactive learning medium that involves interaction between players, where children will learn while playing. This game can be played 2-4 people and has certain rules that players must obey. This board game was dominated by event cards (situation cards) equipped with a response card.

### 3.1. *Format / Media form*

This board game is called I am An Archipelago Kids (Aku Anak Nusantara) with the slogan "Smart and Tolerant" which means that this game teaches children in Indonesia to be able to show tolerance to others (family and friends). This board game is a race game genre. Players will be required to have a strategy to win the game. This game is categorized as a roll and move game, because it uses dice.

### 3.2. *Content menu*

In this game consists of game board, character cards, situation cards, response cards, challenge cards, dice and player's pawn. Character cards are 6 cards. Each character has special abilities that can benefit the player. Special ability can only be used twice in the game. This character card is taken randomly by the player by shaking it first.

A number 50 event card will describe events or problems that children often encounter in the family, at school, or in the neighbourhood. The response card is the response of the player to the event or problem. The response card is 65 cards. Response cards can be divided into five types of cards, namely: "Happy" Card, "Sad" Card, "Happy or Sad" Card, "Take Two Response Cards", and "Throw Questions to Other Players" Cards.

Challenge cards number 40 cards. This challenge card contains questions about Civics Education subject matter, namely: Pancasila, unity in diversity, tolerance and mutual cooperation. Each card is equipped with an answer

### 3.3. *Game flow*

The game flow is describes as follows

- The player shuffles the cards first.
- The player determines the turn to play by performing a hompimpa or rock-paper-scissors.
- The player picks up a character card in the stack of characters that have been shaken.
- The player chooses the pawn and places the pawn in number 1.
- The player picks up a Response card in the shuffled response card.
- The game goes clockwise.
- Situation cards are taken and read by the next player, for example the situation card for the first player, read by the second player, and so on.
- The first player takes one response card, and the second player picks and reads the situation card for the first player. If the symbol shown on the response card matches the one on the incident card, the player has the opportunity to throw the dice then move the pawn on the game board as much as the number that comes out is combined. However, if the symbol shown on the response card does not match the one on the incident card, the player will lose the opportunity to move the pawn on the game board.

- If the dice shows the number six, the player has the right to throw the dice once more. If a player gets six points for three times in a row, then the player gets a Challenge Card.
- If the player arrives in the red box, the player gets a Challenge Card. The next player will take and read the Challenge Card. If the player can answer the questions on the Challenge Card, the player has the right to advance according to the number of points on the Challenge Card. If the player can't or wrongly starts the question on the Challenge Card, then the player must go back according to the number of points on the Challenge Card.
- If the player arrives in a green box, the player can get a bonus to step according to the number shown on the game board; or get a trap so he must retreat according to the number shown on the game board.
- If there are two players who occupy the same box, then the player who occupies the box first.
- Players can throw questions to other players using the Response Card "Throwing Questions to Other Players." If another player succeeds in answering correctly, the player who throws the question does not get a chance to throw the dice. If another player is wrong or can't answer correctly, the player who throws the question will get the chance to throw the dice.
- The game will end if one of the players has reached the finish line first or the player who is at the front (after shuffling the response card twice).

### 3.4. Communication strategy

This game was designed for children aged 6-10 years. The game is one of the fun learning media for children. The communication used in this game is the introduction of various situations or events that may be experienced by children in daily life in the family, at home, and in the neighborhood. The introduction of this situation is stated in the Situation Card. The response or attitude of the child to the incident is stated through the Response Card. If the pawn occupies a red box, the player gets a Challenge Card. This Challenge Card contains questions about Citizenship Education material, especially the material on Pancasila, unity in diversity, tolerance and mutual cooperation. This question indirectly invites children to relearn the Citizenship Education subject matter and invites them to love Indonesia more.

### 3.5. Visual strategy

The theme of the game raised was how to be tolerant in everyday life. The cards were drawn with cartoon illustrations so that the images seem funny and humorous. This funny impression can attract children's attention to play longer.

All cards in this game are: Character Cards, Situation Cards, Response Cards, and Challenge Cards, equipped with pictures that clarify the writing. Game characters were named according to the typical name of the region's character, such as: Gomgom from North Sumatra (Batak), Selvi from East Nusa Tenggara (Kupang). Each character was given a background that is characteristic of the origin of the character, for example: Gomgom was depicted in the background of a traditional North Sumatra house, Selvi wore traditional East Nusa Tenggara (Kupang) clothes and next to her was a picture of Sasando musical instruments. Board games were designed with cultural themes (dances) and typical Indonesian animals (such as orangutans, and rhinos).

Color selection is important for a design. Game boards and game cards were designed using bright colors. Bright colors can create a cheerful impression and can attract interest in playing with children.

### 3.6. Media strategy

Media is a means or means of connecting to convey messages to the target audience.

**3.6.1 Main media.** The main media for this game are game boards, Character Cards, Situation Cards, Response Cards, Challenge Cards, and Dice.

**3.6.2 Supporting media.** This game uses supporting media so that this game can be understood and played by children. Supporting media used in this game are:

- **User Guide**  
This game guide book is used to help children to learn how to play. This guide can also be used by parents or teachers to teach children how to play this game.
- **Pawn**  
Pawn is a game marker for children to distinguish the first player, second player, and so on.
- **Game Box**  
The Game Box is used to provide a glimpse of information about the game and become a game card storage area so that it is not easily scattered.

#### 4. Conclusion

The Game I am An Archipelago Kids (Aku Anak Nusantara (AAN)): Smart and Tolerant was designed to foster tolerance in children aged 6-10 years. This attitude of tolerance is sharpened through learning about the right response or attitude in dealing with situations or events in the family, school, and in the surrounding environment. Tolerance was also strengthened by an understanding of Civic Education lessons, especially Pancasila, unity, tolerance and mutual cooperation. This game was expected to be used at home and at school in shaping the personality of children who love homeland and are tolerant.

#### Acknowledgements

This research was supported and funded by the Ministry of Research and Higher Education (*Kemenristekdikti*) under Program of Excellent Applied Research 2018 (*Penelitian Unggulan Terapan Perguruan Tinggi*).

#### References

- [1] Nurfitri W n. d. *Politik pilkada mengancam rasa toleransi anak*. Retrieved from <http://www.parenting.co.id/usia-sekolah/politik-pilkada-mengancam-rasa-toleransi-anak>.
- [2] Varadi L 2014 *Youth trapped in prejudice: Hungarian adolescents' attitudes toward the Roma*. (Berlin: Springer Fachmedien Wiesbaden).
- [3] Milner D 1987 Children and racism In K. McLeod (Ed.) *Multicultural education: a partnership* (Toronto: Canadian Council for Multicultural and International Education).
- [4] Ramsey P G 1987 *Teaching and learning in a diverse world: Multicultural education for young children* (New York: Teachers College Press).
- [5] Roe M 1982 *Multiculturalism, racism and the classroom: A CEA report* (Toronto: Canadian Education Association).
- [6] Hromek R 2005 *Games to promote social and emotional intelligence for children aged 4 to 14*. (London: Paul Chapman publishing).
- [7] Smilansky S and Shefatya L 1990 *Facilitating play: A medium for promoting cognitive, socio-emotional and academic development in young children* (Gaithersburg, MD: Psychosocial and Educational Publishers).
- [8] Tingstrom D H Sterling-Turner H E and Wilczynski S M 2006 The good behavior game: 1969 2002 *Behavior Modification* 30 225.