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“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



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Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH



WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is “*Optimizing Innovation in Knowledge, Education, & Design*”. We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rd International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

MASTER OF FLOOD PREPAREDNESS (MOFP): GAME-BASED LEARNING TO PREPARE YOUTH TO BE AWARE, PREPARED, AND RESILIENT IN FACING FLOODS

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ABSTRACT

Frequent occurrences of floods in Malaysia lead to loss of life and property damage. Among the vulnerable groups to these disasters, the youth stand out due to socio-economic factors like their age, financial instability, and limited experience. In the context of disaster risk reduction, prioritizing flood preparedness emerges as a critical component to mitigate the impact of flood disasters on both the nation and its citizens. In the context of flood preparedness, accessibility to materials for flood is still in deficit and a future-ready learning approach is required. To address this need, the Master of Flood Preparedness (MOFP) was created to increase awareness of flood preparedness among young individuals. This game-based learning approach encompasses three key components: flood preparedness-related e-books, a game board, and play cards. These elements are integrated into a game format to deliver and enhance youth awareness of flood preparedness. This exceptional MOFP stands out due to its innovative fusion of three elements in one product. It effectively leverages the advantages of online-oriented resources, such as e-books, QR codes, e-journal articles, and e- newspaper articles, while also incorporating traditional offline components like board games and playing cards. Emphasizing a learn-while-playing approach, this platform enables users, especially the youth, to enhance their awareness of the importance and necessity of flood preparedness. This product can also help the country to achieve Sustainable Development Goals (SDGs).

Keywords: Flood preparedness, Disaster risk reduction, Game-based learning, Sustainable Development Goals, Youth

PROBLEM STATEMENT

Average annual losses in Malaysia are estimated to be \$9.8 million due to flooding (Shariff & Hamidi, 2019). According to the Special Report on the Impact of Floods in Malaysia 2021 published by the Department of Statistics Malaysia (2020), the country suffered total losses of RM6.1 billion as a result of the floods that occurred in the latter half of 2021 and the first few months of 2022. This includes tangible and intangible losses such as property and crop damage, casualties, disease outbreaks, and so on. Youth who live in flood-prone areas are categorized as vulnerable populations due to socio-economic characteristics such as age factor, lack of financial stability, and experience deficit (Chan, 2015). Therefore, it is crucial for everyone, particularly the youth, to be well-prepared for floods to minimize their impact and foster resilience. To achieve this, raising awareness about flood risks and acquiring the necessary knowledge on flood preparedness are essential steps. According to Chan (2015), disaster managers and the general public have a responsibility to continually educate themselves on the importance of preparedness as a cornerstone of disaster management. It is a learning opportunity to raise consciousness, and it motivates governments and citizens to take the right steps. Ridzuan et al. (2022) advocated for all stakeholders, including academics and universities, to participate in university social responsibility by creating innovative products to enhance public awareness of flood preparedness. A future-ready learning strategy is necessary, but there is a lack of flood-related resources that are easily accessible (Sa don et al., 2023). Therefore, the Master of Flood Preparedness (MOFP) was developed as a novel approach to educating and empowering youth about the importance of being flood-ready. It is critical to find sustainable approaches to improving disaster preparedness, especially in cases when societal mobilization in disaster preparedness might reduce the cost of rehabilitation and reconstruction.

MASTER OF FLOOD PREPAREDNESS (MOFP)

e-book

In the face of nature's formidable power, humans have often found themselves vulnerable and ill-prepared. In the MOFP e-book (see Figure 1), youth will find an interesting exploration of flood preparedness, ranging from the fundamental principles of flood dynamics to practical strategies for mitigation and recovery. Yet, this e-book is not merely a compilation of facts and figures. It serves as a call to action, urging individuals, especially youth to embrace the collective responsibility in building resilient communities. The e-book is designed with QR codes that facilitate convenient access to additional information on flood preparedness from primary sources (see Figure 2). The QR codes also were created to bring readers to read selected newspapers and journal articles written by the authors (see Figure 3). Moreover, it incorporates engaging and straightforward graphics to enhance reader comprehension of the book's contents (see Figure 4). Despite its specific focus on enhancing the comprehension of the MOFP players,

this e-book has the potential to benefit the general public as well, fostering a greater understanding of flood preparedness. The insights contained within these pages will empower individuals, families, and communities to navigate the challenges of flooding with strength and resilience. Engage with the practical tips, strategies, and best practices presented, understanding that even the smallest actions can have a profound impact in times of crisis. Although this book is designed for playing games, this book also is useful for those who want to have a leisurely feeling in reading the book.

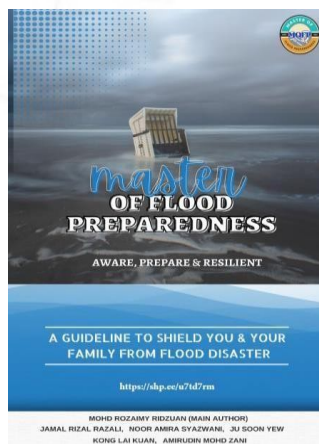


Figure 1. MOFP e-book



Figure 2. QR codes



Figure 3. Publications

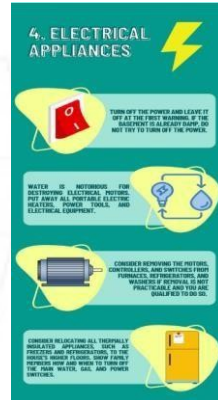


Figure 4. Info Graphics

Board game

The MOFP board game was developed to test players' flood preparedness in a fun way while also educating them. The game's concept draws parallels with the experience of flood victims navigating through numerous obstacles to overcome the disaster. These challenges are represented by colored boxes, as depicted in Figure 5. Before engaging in the game, players are required to follow a series of steps. Players need to stack the playing cards according to their colors. Each player chooses a color token and starts at the 'start' site, getting ready to compete. They must then roll the dice to determine the starting player, with the highest value taking the first turn. Once a player reaches the starting position, they should roll the dice again to determine the number of boxes the token will move. After reaching a box, players need to take the card that matches the color of the box. They are then required to read the instructions or questions stated on the card. If a player answers the question correctly, they can move up to another 2 boxes. If the answer is wrong, they need to move back 1 box. After advancing, the player does not need to take another card; it is the next player's turn. Upon answering, all players read the e-book together and decide by consensus whether the answer is right or wrong.

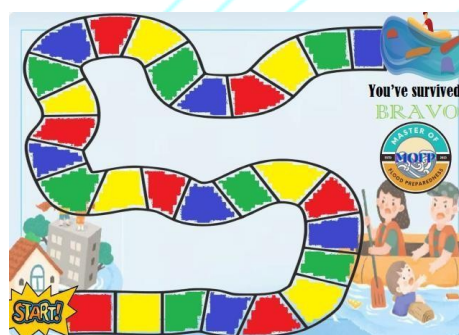


Figure 5. MOFP board game

Playing cards

Playing cards were developed in this game to serve as challenges that flood victims must overcome to successfully “save their lives”. Several questions were developed to test the awareness of the players on flood preparedness. The color of each card corresponds to the color of the box on the board game. Successfully answering the provided questions allows players to progress to the finish line, while failure to answer correctly results in penalties. Players can access the e-book for the correct answers if needed, and the cards also provide hints. The primary objective of this game is to raise awareness among players, particularly the youth, about preparing for flood disasters.



Figure 6. Playing cards

CONCLUSION

The Master of Flood Preparedness (MOFP) is a thoughtfully crafted initiative aimed at increasing public awareness, particularly among the youth, regarding the significance of flood preparedness. This exceptional MOFP stands out due to its innovative fusion of three elements in one product. It effectively leverages the advantages of online-oriented resources, such as e-books, QR codes, e-journal articles, and e-newspaper articles, while also incorporating traditional offline components like board games and playing cards. Emphasizing a learn-while-playing approach, this platform enables users, especially the youth, to enhance their awareness of the importance and necessity of flood preparedness. This product can also help the country to achieve Sustainable Development Goals (SDGs) such as Goal 1-No Poverty, Goal 2-Zero Hunger, Goal 3-Good Health and Well-being, Goal 6-Clean Water and Sanitation, Goal 9-Industry, Innovation, and Infrastructure, Goal 11: Sustainable Cities and Communities, Goal 13- Climate Action, and Goal 17- Partnerships for the Goals. Through the pursuit of these SDGs, nations and local communities can collaborate in enhancing flood preparedness, safeguarding lives and property, and fostering sustainable and resilient societies. The product, which is officially registered with the Intellectual Property Corporation of Malaysia (MyIPO registration number – LY2023C03123), has undergone rigorous testing for its effectiveness, as evidenced in a published study titled "The Effectiveness of the Master of Flood Preparedness (MOFP) in Enhancing Flood Preparedness Awareness Among Malaysian Youths" indexed in Excellence in Research for Australia (ERA). There is a strong aspiration that this product will aid the government agencies led by the National Disaster Management Agency (NADMA) in increasing flood preparedness awareness among the youth, empowering them to face potential flood disasters with readiness.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude and appreciation to Universiti Teknologi MARA (UiTM) and Universiti Malaysia Pahang (UMP) for their invaluable collaboration in developing this product. This joint effort between UiTM and UMP has resulted in the creation of a groundbreaking solution aimed at enhancing flood preparedness measures. The tireless dedication, expertise, and commitment from both institutions have played a significant role in the successful development of this product. We extend our special thanks to the teams involved from both universities for their hard work and collaborative spirit throughout the entire development process. Their collective efforts have not only produced an innovative solution but have also contributed to the advancement of flood preparedness initiatives in our country.

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