

An Interactive Animated Comic of Paedophile Awareness for Children



Siti Zulaiha Ahmad, Nur Anis Idayu Mohd Nor, Anis Maesin

Abstract: Paedophile is an issue that can cause nightmare to children who have become victims as they are likely to suffer physically and emotionally for the rest of their lives. Paedophile awareness is still generally low among Malaysians, especially children, that a creative and attractive method is required to deliver the crucial message. This research focused on the integration of animated comic and interactive multimedia using storytelling elements to create awareness about paedophile. Scenes embedded with the message are put into comic form to attract children's attention and increase their understanding. Therefore, this study aims to develop an interactive application, called 'i-ComPedo' (Interactive Animated Comic of Paedophile Awareness among Children). The study adapts 3-phases research activities for the research methodology, which are analysis and design, development and testing. In order to evaluate the usability of 'i-ComPedo', this study conducted usability that involved primary school children. The usability test revealed that 91.3% of the children perceived 'i-ComPedo' as an interesting, understandable, user-friendly courseware. As a conclusion, an interactive animated comic has been developed to offer a new and innovative approach in instilling awareness among children about paedophile.

Keywords : interactive animated comic, awareness, children, paedophile.

I. INTRODUCTION

Paedophile awareness among children require extensive worldwide attention because the longer people keep silent about this issue, the more rampant it is going to happen. Paedophile is a sexual preference for young children, boys or girls or both [1]. It also concerns many different disciplines, most obviously psychology, psychiatry and criminology. Unfortunately, the awareness about paedophile in Malaysia is still at a low level and that causes insecurity among Malaysians, especially children. As an evidence, child

pornography and paedophile case of Richard Huckle that happened in Kuala Lumpur made him faced multiple life sentences, after admitting to 71 offences of child sexual abuse from 2006 to 2014 [2]. Furthermore, Women, Family and Community Development Minister, Datuk Seri Rohani Abdul Karim revealed that the number of sexual abuses is increasing from time to time [3], as more than 50,000 cases were testified from 2013 to 2018 [4]. Meanwhile, recent studies by the communities showed almost 750,000 children in Malaysia had been sexually abused [5]. Approximately, 70% to 80% of the cases involved family members as the offenders were those who were also close to the victims or had trusted relationship with them [6]. It shows that children are not exposed to paedophile issues. Thus, providing them with the right information regarding this matter is crucial. Therefore, it is an urgent call for every single party to get involved in this matter to educate children [7] on how they should react towards it.

Even though there are attempts by government agencies and NGOs in creating public awareness through mass media such as forums and campaigns, there is still insufficient number of education programs that utilize computer technology to create awareness of paedophile in schools [8]. It shows that an innovative digital content of paedophile awareness is at an infancy stage, in disseminating specific and enough information regarding this issue. The delivery of the messages to children should not only cover relevant information on this issue but must also be creatively designed using attractive and interactive approaches to ensure effective dissemination process. This is to prevent them from traumatic experiences and future negative implications that could be the result of having been sexually abused [8 - 9]. In fact, the lack of paedophile awareness among children create a loop for paedophile predators to attack their victims. Therefore, an innovative solution is pivotal to expose children this matter early.

One of the approaches to increase awareness of paedophile among children in early stage is by introducing a digital comic that conveys a specific message using storytelling and interactive multimedia elements. It is because comics is just as sophisticated as other forms of literature, and children benefit from reading them at least as much as they do from reading other types of books [10]. Apart from that, most children like to interact with multimedia features such as pictures, music and sound effects [11]. The inclusion of graphics in gaining from multimedia principle is very important as it connects with children to gain recovering from word and images than from words alone.

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Therefore, it is expected that animated comic using multimedia elements will be able to convey sufficient information for children to have a clear understanding on paedophile issue. So, they will be more engaged and informed. In line with that, this study proposes an animated digital comic by using storytelling with interactive multimedia elements as an alternative mode of raising their awareness.

Therefore, this study aims to discuss the development of awareness digital content by utilizing three main approaches, which are animated comic, storytelling and interactive multimedia.

The paper is organized into four main sections; the second section discusses on the literature review related to paedophile issue, the third section covers on the methodology, the fourth section focuses the proposed application for awareness digital content, the fifth section elaborates the results and findings and the last section concludes this study

II. LITERATURE REVIEW

A. Paedophile – At a Glance

According to Childhelp National Child Abuse, child sexual abuse or paedophile is any helplessness to act, by a parental, other protectors and public that outcomes in genuine or potential mischief to a kid [12]. It can in a child's home, or in the relations', schools or networks that the child interacts with, and incorporates all types of physical maltreatment, sexual maltreatment, emotional maltreatment, or disregard. Besides that, paedophile also refers to any activity that can pressure or coerce somebody to accomplish something explicitly even though they would not wish to do it. It refers to physical, sexual, enthusiastic abuse, or disregard of youngsters. It might happen at each financial dimension, over any cultural and social lines and inside all faiths [8]. In short, paedophile implying behaviour that impacts their capability to control sexual movement or situations in which sexual action or fantasies happens [13], including physical and oral sex.

B. Awareness of Paedophile among Children

Information holes and misperceptions about paedophile are boundless among the overall population, experts and social sentiment pioneers. Our leaders in community, religion, government, and media are essentials bearers of this knowledge, and awareness is necessary in the general public, especially at the societal level. According to [14], paedophiles have challenge in disclosure of awareness because it is noteworthy worldwide general wellbeing concern, influencing one out of eight youngsters and causing monstrous expenses including despondency, undesirable pregnancies and HIV cases.

Leclerc and friends provide steps to keep children as safe as possible [15]. It includes ensuring the places they spend their time are safe, giving adults the knowledge and understanding to take actions and take responsibilities to help children speak out about paedophile with the knowledge and understanding. Children should avoid isolated places, never go into open

toilets alone, and never stroll to school alone, not acknowledge vehicle cycles by outsiders and thump on the entryway of a house if they are being pursued [16]. Children likewise should tell their parents or anyone if somebody abuses them.

Creating awareness on child sexual abuse or paedophile is a sensitive issue that makes individuals to a great degree uneasy, as some are not really open to discuss deeply [17] on this matter, especially if it is related to family circle. Family structure is the most imperative hazard aspect in paedophile. Children who live with two wedded natural guardians have low dangers for maltreatment. The dangers will increase when they live with step-guardians or a single parent. Furthermore, the children should be able to: i) differentiate between safe and unsafe touches [18] and ii) understand to which extent they can mingle with their family members and other people [17]. Even though some of the children understand the meaning of paedophile from their readings and social media contents, their reaction to this issue is unknown for the worst-case scenario (become a victim of paedophile). Greater knowledge gains require enhanced awareness among the children regarding paedophile issues [14]. Therefore, this study further explores the use of digital content to educate children and raise their awareness of these paedophiles issues.

C. Strategizing Paedophile Awareness Using Creative Digital Content

This study is mainly to educate children about paedophile where they can learn, gain knowledge and practice how to protect themselves in any circumstances involving paedophile threats. As discussed in the earlier section, the creative digital content in this study blends three main elements which are, animated comic, digital storytelling and interactive multimedia.

Comic is an effective medium to express thoughts by means of pictures combined with informative message specifically for an instructional learning content [19]. Afrilyasanti and Basthomi [20] agreed that comics could give a meaningful communication since it could connect the study material and the environmental phenomena. In this digital comic era, technology is used as an innovative method for educating and learning. Hence, animated comic is beneficial to stimulate learning process in the classroom and not just a fun art-enrichment activity. It provides narrative experiences for students, especially children who are just beginning to read and for acquiring a new language [21]. Animated comic also does not require long sentences or sections to recount a decent story that can only be shown in specific scenes and dialogs. Just a couple of words are required for the characters to approach their lives and uncover their accounts.

This study also proposed the utilization of digital storytelling (DST) concept and elements in the comic to strengthen the delivery of message based on the specific storyline. DST is a form of video communication that includes images and sounds along with narratives such as web-based stories, interactive stories, hypertexts, and narrative computer games to present an idea or a story [22].

The children may follow story beginnings and endings, plot, characters, time, setting, and sequencing without needing sophisticated word decoding skills. Besides that, images also support the text and give children significant contextual clues to the word meaning [23]. Miller [24] highlights seven elements in DST that cater on the point of view, dramatic question, emotional content, soundtrack, economy, pacing and voice.

Those elements were also structured by Center for Digital Storytelling as cited in [25].

Both concepts and elements would be effective and attractive with combination of interactive multimedia elements.

The utilization of text, graphics, audio, video and animation would enhance the engagement of the proposed digital awareness content as interactive multimedia is a proven useful instructional material [26-27]. In fact, the interactive approach in the learning tools may also be useful to assist children in interacting and internalizing the contents [28-29]. Interactivity includes all responsive multimedia elements that could give feedback to the users. Fig. 1 illustrates the strategy employed in creative digital content for raising paedophile awareness in this study.

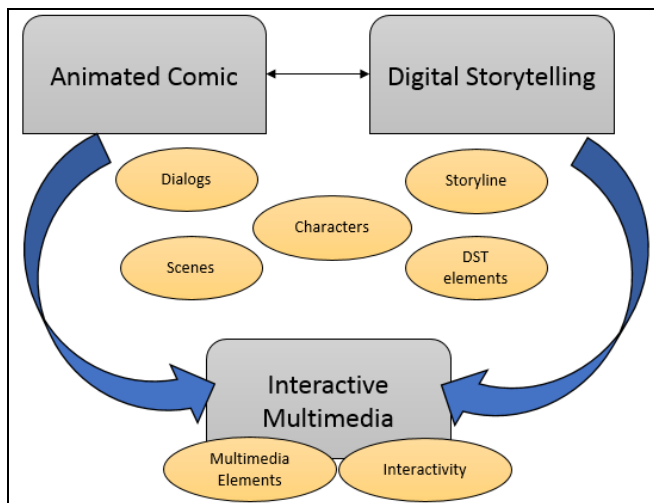


Fig 1. Conceptual Strategy of Creative Digital Content

III. METHODOLOGY

This study involves 3 main phases for the research activities, which are analysis and design, development and testing. The first phase focuses on analysing the concept and strategy of the pedophile awareness content and designing the content based on the storyline applicable to school children. At this stage, animated comic, digital storytelling and interactive multimedia were incorporated as a fundamental concept for this study. Within the provided conceptual strategy (refer Fig. 1), two main stories have been chosen as the content to deliver the message of paedophile awareness. Having verified the content with the teachers from selected schools, the design of both stories was converted into digital comic scenes using Adobe Illustrator. All scenes, dialogs and characters consist of specific elements of storytelling. Next, the development phase took place using ADDIE Model in developing the paedophile awareness content by integrating the multimedia elements into the digital comic content and

i-ComPedo was produced. The interactivity elements were embedded into i-ComPedo in order to ensure the children could interact with the application easily. This was conducted an early stage of testing to ensure that the application is user-friendly. In this phase, usability testing has been conducted to validate the user interface design by implementing task-based usability testing [30]. It was conducted using task-based checklist as not all primary school children could answer written questionnaire as the participants ranged from 7 to 10 years old. In addition, the result would be more accurate by directly assessing the application based on user interaction. Fig. 2 depicts the flow and activities of each of the phases.

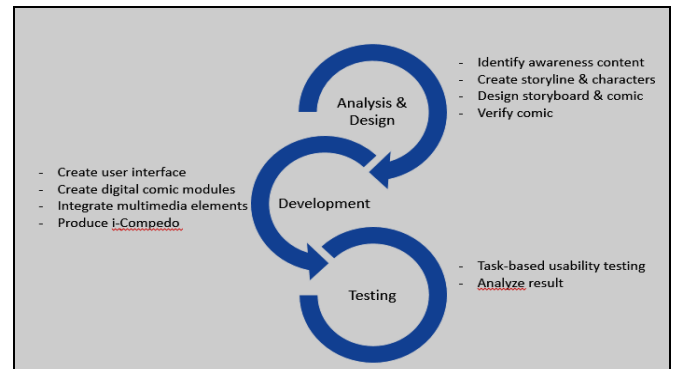


Fig. 2. Phases of research activities

A. i-ComPedo – An Interactive Animated Comic of Paedophile Awareness Glance

i-ComPedo provides an interactive content by utilizing animated comic elements to create awareness on paedophile threats towards children, which consists of three main modules. It offers two scenarios (*Cerita 1* and *Cerita 2*) by providing interesting storylines involving a girl and a boy as the victims for the first module. i-ComPedo also covers the basic information related to paedophile (Pedo Info), narrated by a doctor (character) in the second module. This module visualizes parts of the body that need to be protected by the children. It also informs the user (children) how to react if they ever face certain unprecedented situations. The last module provides some exercises (*Kuiz*) to enforce knowledge gained throughout the content exploration. The explanation referred to paedophile cases that happen in *Cerita 1* and *Cerita 2*. Fig. 3 depicts the main screen of i-ComPedo apps.



Fig. 3. Main Screen of i-ComPedo

The inclusion of animation in the comic is shown in Fig. 4. Besides that, the montage page and main page, utilize animation to attract the users' attention as it can create simplified illustrations of a simulation.



Fig. 4. Animated comic element in i-ComPedo

Interactive elements have been embedded in each module to engage and ease the children to explore the whole content of the apps. For example, in Figure 5, user can click on the audio icon to repeat the dialogue. This is to help some children who might have problem reading fluently as they are at the lower level of primary school. Another example is, info icon was also included to inform user about the situation, venue and characters. Therefore, it helps and guides the children to interact with the application.

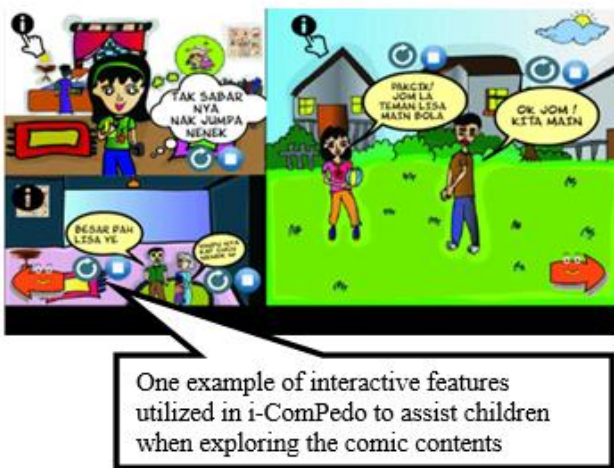


Fig. 5. Example of interactive element in i-ComPedo

Each scene of the comic appears based on frame by frame with suitable pace, to ease the children to follow the storyline and understand the content. Dialogues for each frame are narrated clearly by the characters using personalized voice over element. In addition, every page of i-ComPedo provides two navigation buttons (Back and Next) to enable the children to control the flow of the comic content. They can easily go back and forth to explore the whole content of the comic. User can easily exit the application at any point.

B. Awareness of Paedophile among Children

In order to evaluate the application's (i-ComPedo) usability aspects, the participants were required to accomplish the tasks while the researcher observed and recorded the

result in the checklist instrument especially created for this purpose. The listed tasks are based on five main categories that are related to navigation, sound, interaction, content and design, extracted from the three main modules. There are 27 tasks with two main indicators that the observers had to record, as either "successful" or "unsuccessful", including some remarks on the difficulties encountered by the participants. The participants, as tabulated in Table I, were chosen from two primary schools in Perlis.

Table- I: Sample of participants

| Total of Participants | Number of Participants by Gender | |
|-----------------------|----------------------------------|--------|
| | Male | Female |
| 30 | 14 | 16 |

At first, the participants were given 5 minutes to explore the modules of i-ComPedo using laptops. Then, the researchers gave them instructions to accomplish the tasks from the checklist and recorded the results together with the remarks for justification purposes. The usability testing took 5 to 10 minutes for the children to complete

IV. RESULT AND FINDING

This section describes the result of task-based usability testing tabulated in a bar-chart. During the testing session, the participants were patient and calm while the tasks instructions were given to them. They were also excited and interested to test the application and were able to accomplish all the tasks. Table II lists the number of tasks according to the category and an example of each.

Table- II: Number of tasks for each category and example

| Category | Number of tasks | Example |
|-------------|-----------------|---|
| Navigation | 4 | Go to Instruction Page |
| Sound | 4 | Listen to the instruction voice clearly |
| Design | 4 | Identify Start Button. |
| Interaction | 8 | Select <i>Cerita 1</i> button |
| Content | 5 | Able to understand content of <i>Cerita 1</i> |

Table- III: Successful mean score percentage by category

| Category | Mean Score (%) |
|-------------|----------------|
| Navigation | 98.60 |
| Sound | 100.00 |
| Design | 77.50 |
| Interaction | 98.66 |
| Content | 81.65 |

Table III tabulates the mean score percentage for successful task that have been accomplished by the participants. It clearly reveals that i-ComPedo provides clear and comprehensible navigation elements as 98.67% of the participants were able to navigate easily. The result revealed that in navigation section, most of the children did not have any problem in clicking on buttons for all tasks given (4 tasks). However, it is noted that the children were mostly confused about one of the tasks, as the children had to go back to home page after all sections in the application were explored. This is because they did not click the next button that directly go to the home page.

On the aspects of sound, the voice over, background audio, and instructions were clearly embedded into i-ComPedo. This is clearly shown with 100% successful percentage rate.



This can be observed during the execution of the application where the children were attracted to the background music and the voice that narrated of the stories.

The lowest average of the successful percentage rate goes to interaction category (77.5%) because many participants had problem to replay the audio button as instructed. From the observation, the researcher found that the participants thought the button was merely a graphical object and it contributed to the interaction problem.

Next, the result for content revealed that almost all participants (98.66%) did not have problems in understanding the content of *Cerita 1* and *Cerita 2*. They also did not have problem with the quiz section. However, some of the participants misunderstood the message delivered by “doctor” as they were not clear with the instructions in that module. Simplification is required on the instructions to improve their understanding.

Lastly, the interface designs of i-ComPedo proved to have been nicely organized and consistent throughout all modules as most of the participants were able to accomplish the given task (81.65%). As observed, they only faced some difficulties to start the application as the main page was designed with 2-D graphical elements and the start menu is lacking in terms of its appearance. Overall, the results revealed most of the children understood i-ComPedo application as the mean score of each element obtained more than 75% with overall mean score is 91.3%. The high successful percentage rate of each category is illustrated in Fig. 6.

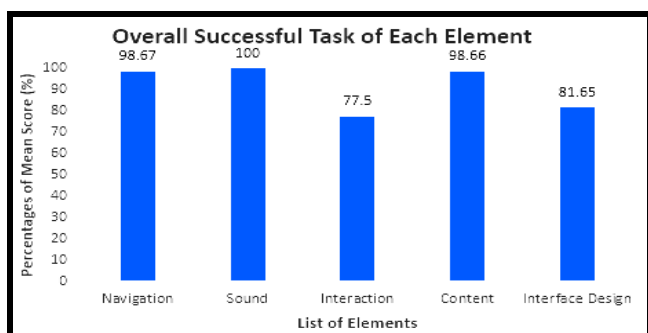


Fig. 6. Successful task-base mean score of each category

V. CONCLUSION

This research is carried out with the purpose of developing and creating an interactive animated comic of paedophile to raise awareness among children. This application has been developed based on 3-phased research activities. Apart from that, usability testing was also conducted to understand how the users interact with the application and improvements were done based on the results. The findings from the observation, showed that the use of suitable multimedia elements in developing ‘i-ComPedo’ for the children fulfills the requirements for a multimedia application. During the usability testing on the children, it was found that the application was easy for them to use. This application achieves the target to be a helpful tool to support children in learning. In addition, the use of multimedia courseware is one of many effective ways in creating awareness as it can help enhance learning. Furthermore, it is believed that this

application can assist teachers and parents in teaching children to take care of their parts of body from being touched by strangers. As the conclusion, in this study, the multimedia application has been successfully designed using suitable multimedia elements and developed as a multimedia learning aid for creating children’s awareness about paedophile through animated comic. The application of multimedia elements in i-ComPedo could invoke the children’s interest as well as stimulate awareness among children and engage to attractive approach of learning. In future, it is recommended that more varied activities are added for the quiz section with game-based learning approach.

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REFERENCES

- O. M. Moen, “The ethics of pedophilia”, *Etikk i Praksis*, 9(1), 2015, pp. 111–124.
- L. Paul, “Malaysian communities in denial after major pedophile case”, *Police Say*, 2018, pp. 1–6.
- T. Handayani, and N. Kurniawati, “Fostering Community Awareness in Preventing and Handling Pedophilia”, In *International Conference on Ethics in Governance (ICONEG 2016)*, Atlantis Press, 2016, pp. 103-106.
- J. Bunyan, “50,000 sex crimes, domestic violence cases since 2013”, *The Malay Mail*, 23 Jul 2018, Available: <https://www.malaymail.com/>
- S. Indramalar, “One in 10 Malaysian children are sexually abused, usually by those they trust”, *The Star*, Friday, 29 Nov 2019, <https://www.thestar.com.my/>
- I. G. S. Cheah, and W. Y. Choo, “A review of research on child abuse in Malaysia”, *Medical journal of Malaysia*, 71(1), 2016, pp. 87-99.
- T. A. A. Saputra, and E. Sopyono, “Criminology Study on Pedophilia Prevention in Indonesia. *Criminology*”, 9(2), 2018, pp. 117-127.
- A. Othman, and W. A. J. W. Yahaya, “A Preliminary Investigation: Children’s Awareness of Child Sexual Abuse in Malaysia”. *International Journal of Social Science and Humanity*, 2(3), 2013, pp. 242–247.
- S. Nurbayani, E. Malihah, S. Komariah, and L. Utami, “Pedophilic sexual disorders towards children: How should the community be taken care of?”, In *Research for Social Justice: Proceedings of the International Seminar on Research for Social Justice (ISRISJ 2018)*, Indonesia, Routledge, 2018, pp. 137-141.
- University of Illinois at Urbana-Champaign, “For improving early literacy reading comics is no child’s play”, *ScienceDaily*, 2009, Available: www.sciencedaily.com/releases/2009/11/091105121220.htm.
- Z. K. Takacs, E. K. Swart, and A. G. Bus, “Benefits and Pitfalls of Multimedia and Interactive Features in Technology-Enhanced Storybooks: A Meta-Analysis”, *Review of Educational Research*, 85(4), 2015, pp. 698-739.
- Childhelp, “Defining Child Abuse: What is it?”, 2016, Available: <https://www.childhelp.org/story-resource-center/defining-child-abuse/>
- G. A. Capra, B. Forresi, and E. Caffo, “Current scientific research on paedophilia: A review”, *Journal of Psychopathology*, 20, 2014 pp. 17-26.
- B. Mathews, and D. Collin-Vézina, “Child sexual abuse: Raising awareness and empathy is essential to promote new public health responses”, *Journal of Public Health Policy*, 37(3), 2016, pp. 304–314.
- B. Leclerc, J. Feakes, and J. Cale, “Child sexual abuse in youth-oriented organisations: Tapping into situational crime prevention from the Offender’s perspective”, *Crime Science*, 4, 28(2015).

16. D. Russell, and D. Higgins, (2019). Safeguarding capabilities in preventing child sexual abuse: A scale measuring knowledge, attitudes and skills applicable to all youth-serving sectors. *Child Maltreatment*.
17. R. Cowan, R. F. Cole, and L. Craigen, "School-Based Child Sexual Abuse Prevention: Implications for Professional School Counselors", *The Professional Counselor*, 9(3), 2019, pp. 200-210.
18. M. L. Pulido "Safe Touches: Creating a School Community to Prevent Child Sexual Abuse", In Panlilio C. (eds.) *Trauma-Informed Schools*, Cham, Springer, 2019, pp. 1-7.
19. P. D. A. Putra, and M. Iqbal. (2014). Implementation of Digital Comic to Improve Creative Thinking Ability in Integrated Science Study, *Interaction*, 4(3), 2014, pp. 71-74.
20. R. Afrilyasanti, and Y. Basthomi, "Adapting Comics and Cartoons to Develop 21st Century Learners", *Language in India*, 11(11), 2011, pp. 552-568.
21. B. Zimmerman, "Using Digital Comics for Language Learning", *ELearn*, 2010(1), 2010.
22. B. R. Robin, "Digital storytelling: A powerful technology tool for the 21st century classroom", *Theory into Practice*, 47(3), 2008, pp. 220-228.
23. P. R. Lim, and N. M. Noor, "Digital Storytelling as a Creative Teaching Method in Promoting Secondary School Students' Writing Skills", *International Journal of Interactive Mobile Technologies (IJIM)*, 13(07), 2019, pp. 117-128.
24. E. A. Miller, "Digital Storytelling". Graduate Research Paper, 1209, 2009, pp. 1-35.
25. R. Malkawi, M. Alzaqebah, A. Al-Yousef, and B. Abul-Huda, "The impact of the digital storytelling rubrics on the social media engagements", *International Journal of Computer Applications in Technology*, 59(3), 2019, pp. 269-275.
26. S. Firdaus, and R. Hidayah, "The Effect of Using Atomic Models Interactive Multimedia Flash Based on Students Learning Outcomes", In *National Seminar on Chemistry 2019 (SNK-19)*, Atlantis Press, 2019.
27. D. Campbell, "What is Multimedia?", *Rhodes Journalism Review*, 2013.
28. F. Simba, P. Makuru, and E. Kalinga, "Developing Multimedia Enhanced Content to Raise HIV/AIDS Awareness to Children", In P. Nielsen and H. C. Kimaro (Eds.): *ICT4D 2019, IFIP AICT 552*, Springer, Switzerland, 2019, pp. 433-444
29. R. E. Mayer, "Research-Based Principles for Multimedia Learning" 2006.
30. T. Tullis, and B. Albert, "Measuring the user experience: collecting, analyzing, and presenting usability metrics", Newnes. Morgan Kaufmann, 2013.

multimedia approaches to create an awareness, design and develop an interactive animated comic. Her projects are mostly related to Human Computer Interaction and Information System. She joined numerous innovation competition national and international level. She also awarded with medals on those participations.



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