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REDESIGN BLOCK TOYS USING EMOTION WHEEL APPROACH

N. Rauf A. Padhil D. Lantara D.W. Thamsyul

Industrial Engineering Department, Indonesian Muslim University, Makassar, Indonesia
nurhayati.rauf@umi.ac.id, ahmad.padhil@umi.ac.id, dirghayu.lantar@umi.ac.id, wulandari.dwi046@gmail.com

Abstract- The product redesign uses the Emotion Wheel Approach, method to determine the level of emotion of the respondents in relation to toy block products before and after the redesign. The results of the Geneva emotion wheel assessment conducted before product redesign on positive emotions are lower than negative emotions, namely 2.22 on positive emotions and 3.77 on negative emotions. It was concluded that respondents gave suggestions related to block toys for improvement. After the improvements were made, the assessment results were 3.83 on positive emotions and 1.55 on negative emotions. These results show the value of user experience that increases between the initial design and redesign. In addition, the results of the improvement design based on the suggestions given by respondents with the appearance of toys that tend to be bright but not dazzling, namely pastel and natural colors measuring 18×18×16 cm.

Keywords: Redesign, Block Toys, User Experience, GEW, Ergonomic.

1. INTRODUCTION

Children experience physical, intellectual, social and emotional growth and development from an early age. At this stage, stimulation is needed for children's growth and development to develop maturely. However, in this era of technological advances, children's motor development tends not to be optimally stimulated. In help the development of a technological and scientific and culture in order to construct first coherent, rational and global [1]. Currently, children are exposed to a lot of technology in the form of using gadgets, most of which only provide cognitive stimulation, so that they do not hone their motor development [2].

The development of children's motor skills includes gross and fine motor skills. Fine motor development is a movement that uses fine muscles to coordinate with the brain when performing activities. This fine motor movement only involves certain parts and is carried out by fine muscle muscles, such as skills involving coordination of eye and finger movements [3]. A form of play that can be used to improve the ability of children to move is to use blocks of toys. Montessori block toys are a type of wooden chunk game that is popular among children. The chunks can be arranged into any model according to the child's creativity. With this game, nerve coordination, fine muscles will be trained, so that finger movements are more skillful in various activities [4].

The use of educational game tools is widely found in Early Childhood Education (ECE) schools. From the observations made at Makassar Montessori School, it is known that the lack of enthusiasm when children play Montessori blocks is because this game has not provided a good user experience for users. ISO 9241-210 defines user experience as the perception and reaction of people through the use of products, systems or services that include all emotions, beliefs, choices, physical responses, psychology and user behavior before, during and after use [5]. Products that can cause a good user experience must be the ones that will be liked by users so that the user experience assessment is considered very important because of the emotional connection with a product [6].

Emotions play a role in the decision making that a person makes towards a product [7]. In addition, the results of market research also show that very few consumers make decisions purely based on the function of a product [8]. The involvement of consumer emotions and feelings in the selection of a product should be taken into consideration for designers when designing a product. Consumers will choose a product if the impression that consumers want to feel is on the product [9]. Given the importance of the lesson planning phase as a framework and guide for action and in the continuity of our research project initiated by the analysis [10].

The majority of users make decisions using their thoughts and emotions, so assessing emotional reactions is critical to understanding how to improve interactions when designing a product to create a positive user experience [11]. There are several methods that can be used to measure user experience, one of which is the Geneva Emotion Wheel (GEW). Therefore, looking at the existing problems, it is very important to conduct research and redesign Montessori block toy products using the Geneva Emotion Wheel (GEW) method so as to create a positive experience for consumers.

2. RESEARCH METHOD

The methodology used to redesign Montessori block toys in this study is the Geneva Method of the Emotional Wheel used to determine the respondents' emotional response to a product [12].

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Emotion in this case is defined as multi-component which includes subjective, reactionary judgement in preparing for action and expression, tendency of one's action, and regulation. [13]. Products can evoke a wide range of emotions [14]. The expression of these emotions and feelings will create a feel, impression, like, comfort when consumers choose a product [15].

The Geneva Emotion Wheel divides emotions into 20 emotions (ten positive emotions and ten negative emotions). The emotions are systematically arranged in circles and form a two-axis wheel based on valence (positive and negative) and control (high and low control). [16, 17]. Low or positive control, high or negative control, low or positive control, and high or positive control are the four squares that result from the two axes segmenting emotions. Each square contains 5 emotions depending on the type of the square, as shown in the figure below. The Method Geneva Emotion Wheel (GEW) approach uses a 5-point scale (neutral scales are also counted). The circular scale gives the respondent an overview of all the emotions felt as well as their intensity [18].

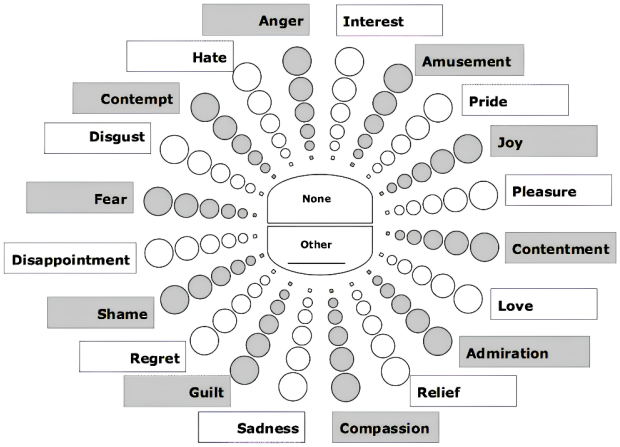


Figure 1. Geneva Emotion Wheel (GEW)

With the emotion graph, respondents can fill in the emotions felt in levels of intensity from low (center of the circle) to high (to the edge of the circle). In addition, in the center there is also a choice of neutral emotions, and other emotions. There are three ways of filling in the GEW:

1. Respondents choose only one emotion. If there is no emotion felt, the respondent can choose none, while if there is another emotion that is completely different from the 20 existing emotions, the respondent can fill in the other column.
2. Respondents selected some mixed emotions. The emotions felt are sometimes a mixture of several emotions so respondents are asked to provide intensity for some of the emotions felt. Similar to the first method, if there are no emotions felt, the respondent can select "none" while if there are other emotions that are very different from the 20 emotions, the respondent can fill in the "other" column
3. Respondents are required to rate the 20 existing emotions in this alternative respondents are required to provide an assessment of the intensity of the 20 existing emotions even though the intensity of the emotion felt is very small.

In this research, the third approach is used with the aim of getting as much emotional description as possible from product users and at the same time opening up opportunities if there are some emotions that cannot be felt by users [19]. Data collection was conducted directly using purposive sampling method. It began with in-depth observations related to respondents' emotional responses to Montessori block toy products. This method uses criteria determined by the researcher to select samples on the basis of certain considerations. [20]. The process was carried out by distributing questionnaires to the teaching staff of the Makassar Montessori School who met the criteria, namely 15 respondents out of 16 teaching staff at the Makassar Montessori School. The questionnaire was distributed twice, namely:

a) Distribution of the GEW questionnaire before the design of the Montessori block toy design
b) Distribution of GEW questionnaires after the design of Montessori block toy designs.

3. RESULT AND DISCUSSION

The following is the initial design of a block toy with design specifications that will be the parameters of this research.

Figure 2. Block toy before redesigning

The questionnaire test was carried out on 15 respondents Who had completed the survey. Given the quantity of responses, it is established that the table r for this a valid test is 0.514 obtained from the r-table with N = 15 and *alpha* = 0.05 (two-way test). As a result, each and every item that displays successfully and has a computed r value greater than 0.514 is considered valid [21]. Twenty emotions that have been valid then go through the next stage, namely the reliability test by calculating The value of Cronbach's alpha.

The questionnaire is said to be reliable or reliable When the twenty emotions have a Cronbach's alpha value above 0.6, they are deemed dependable of 0.926 (more than 0.6). This data processing was carried out using SPSS 26.0 software. The next stage respondents were asked to assess the product before improvement and the average results of 20 emotions including ten negative and ten positive emotions are visible in Table 1.

Table 1. GEW value before redesign

Emotion (+)	Average	Emotion (-)	Average
Fun	3.07	Sadness	3.87
Entertaining	2.93	Guilty	3.93
Proudly	1.80	Regret	3.93
Carefree	2.00	Shame	4.00
Like	3.07	Disappointed	2.20
Satisfaction	1.73	Fear	4.00
Love	1.93	Sick	4.13
Admiration	1.87	Disgusting	3.87
Relieved	2.00	Hate	4.13
Touched	1.80	Angry	3.67

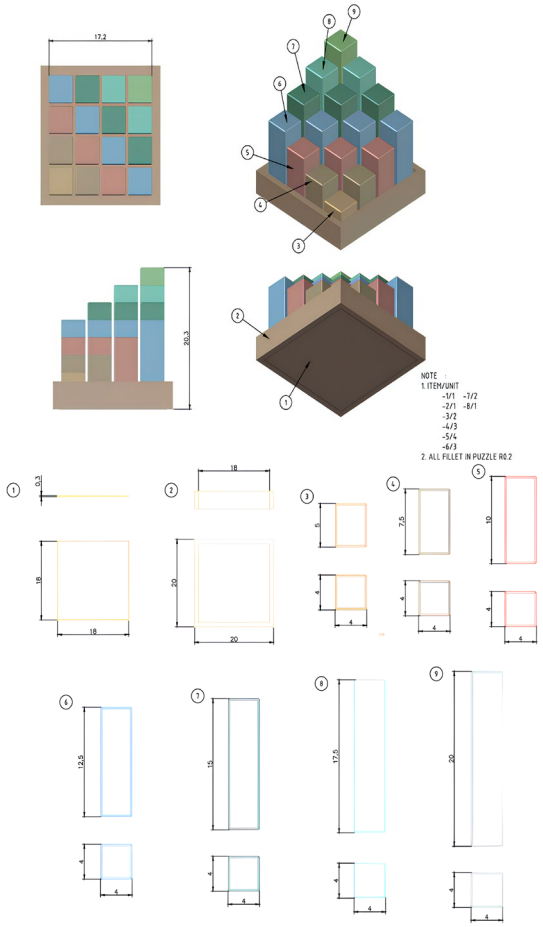
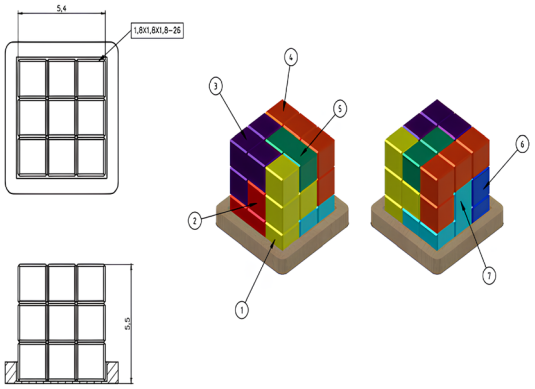


Figure 3. Block toy blocks Model A

Based on the table of results of the average GEW value above the Montessori block toy product before design on positive emotional data has a lower average value than negative emotional. This indicates that respondents want new innovations from previous products. Then a redesign was carried out to increase the value of user experience on Montessori block toy products.

This product design is designed based on data processing and in accordance with the suggestions that have been given by respondents. The results of respondents' suggestions for product assessment then formed 3 different concepts. The design results can be seen as follows:



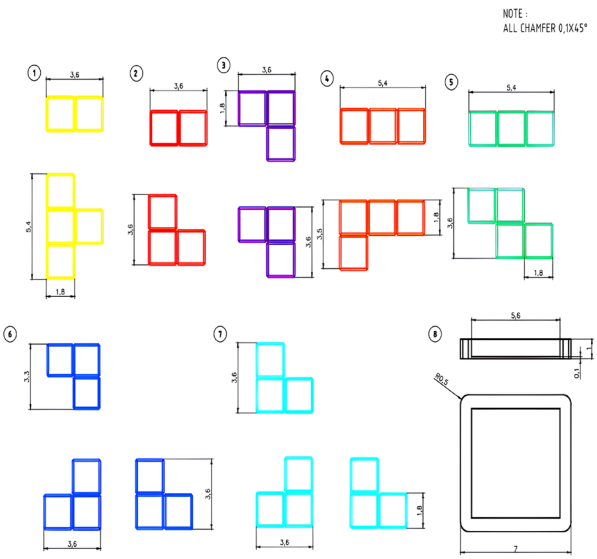
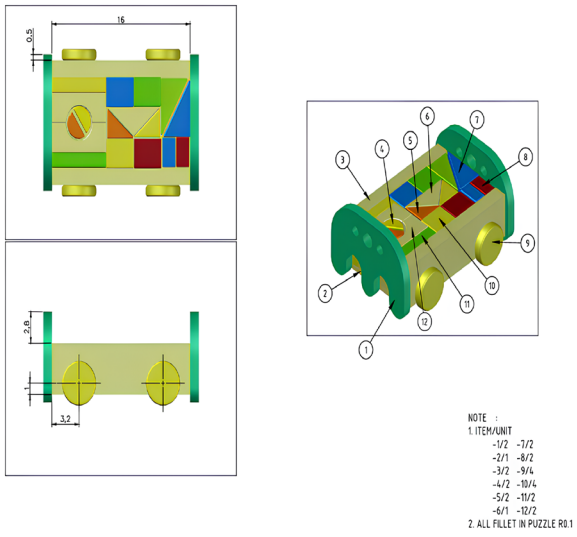


Figure 4. Block toy blocks Model B



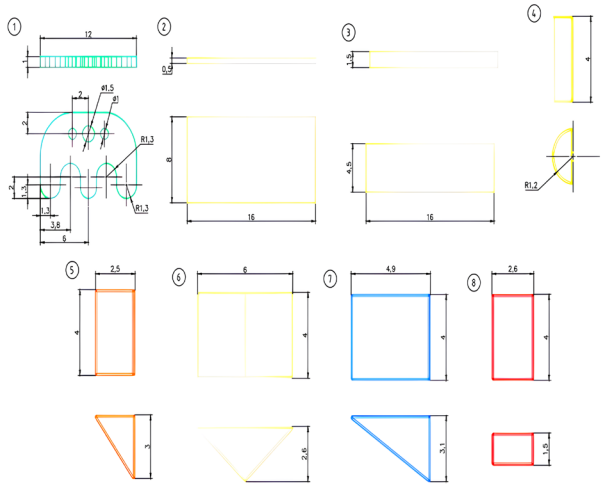


Figure 5. Block toy blocks Model B

Design selection was carried out by distributing questionnaires to the same respondents in the first GEW questionnaire with a total of 15 people. This questionnaire only displays a visual design for design selection where respondents can choose the desired block toy design. The questionnaire's results are displayed in Figure 6.

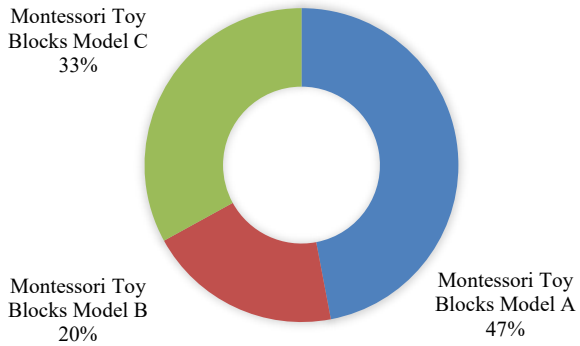


Figure 6. Block toy blocks Model

The data shown in the graph above is that of the 15 respondents, 47% of respondents liked the design of the toy block model A 20% of respondents liked the design of the toy block model B and 33% of respondents liked the design of the toy block model C. So the selected design is the design of the toy block model A with the following specifications.

Table 2. Product Specifications

No.	Component	Total	Material
1.	Container Base	1	MDF Wood
2.	Container Side	4	Pine Tree Grove
3.	Beam I	1	Pine Tree Grove
4.	Beam II	2	Pine Tree Grove
5.	Beam III	3	Pine Tree Grove
6.	Beam IV	4	Pine Tree Grove
7.	Beam V	3	Pine Tree Grove
8.	Beam VI	2	Pine Tree Grove
9.	Beam VII	1	Pine Tree Grove

From the results of the questionnaire identification, the Montessori block toy model A was chosen as the most popular block toy by respondents with toy specifications with a rectangular block shape of 16 pieces with varying sizes measuring 18×18×16 cm so as to make the toy sturdy when arranged and made with a simple shape but the game mode can be developed by children according to their creativity. The use of color is an important element in the design of this toy. This is because the presence of color will be a special attraction for children [22]. The choice of colors that tend to be bright but not dazzling is one of the considerations so as not to make children's eyes easily tired [23], design with participatory can reduction a failure [24].

In addition, the use of colors in block toys no longer uses basic colors because it adapts to the age stage of children, namely 5-6 years old where at that age children need to be introduced to secondary and tertiary colors. With the improvements that have been made, it will increase the positive experience of the product. After designing and selecting the product image design. Furthermore, the second GEW questionnaire was assessed and filled in to find out the average value of GEW after the redesign. The distribution of this questionnaire also has similarities with the first GEW questionnaire. The average results of 20 emotions including 10 positive emotions and 10 negative, Table 3 displays emotions:

Table 3. GEW value after redesign

Emotion (+)	Average	Emotion (-)	Average
Fun	3.87	Sadness	1.80
Entertaining	3.93	Guilty	1.60
Proudly	3.73	Regret	1.73
Carefree	3.73	Shame	1.60
Like	4.33	Disappointed	1.27
Satisfaction	3.87	Fear	1.67
Love	4.07	Sick	1.40
Admiration	3.87	Disgusting	1.47
Relieved	3.53	Hate	1.53
Touched	3.33	Angry	1.47

Based on the results of the normality test output that has been obtained, it shows that the Asymp.Sig. value before the design is 0.171 and the Asymp.Sig. after design is 0.200, so average emotion data of GEW questionnaire before and after design is normally distributed. In accordance with the results of normality test output that has been obtained, it shows that all data is normally distributed because it has an Asymp.Sig.<value> 0.05.

Furthermore, a significance test was conducted to determine whether there was a difference in the average GEW score before and after the product was designed. The method used in this significance test is the matched T-test. Considering the outcomes of the matched T-test significance test output that has been obtained, the Asymp.Sig. value is 0.000, so the average GEW score data before and after design on positive and negative emotions is significantly different.

Table 4. GEW Value Before and After

Emotions	Before	After	Significance Test
Positive	2.22	3.83	Significantly different
Negative	3.77	1.55	Significantly different

There is a substantial difference, according to the significance test's results. difference in negative emotions and positive emotions towards product design before and after being designed.

4. CONCLUISION

From the results of research that has been conducted before product redesign, it can be seen that the positive emotions generated are lower than negative emotions, namely 2.22 on positive emotions and 3.77 on negative emotions. In this case it can be concluded that the respondents gave suggestions related to Montessori block toys for improvement. After making improvements using the same method, the value obtained on positive emotions is higher than the negative value, namely 3.83 on positive emotions and 1.55 on negative emotions. These results show the value of user experience that increases between the initial design and redesign. In addition, the results of the improvement design based on the suggestions given by respondents with the appearance of toys that tend to be bright but not dazzling, namely pastel and natural colors measuring 18×18×16 cm. With a total of 16 blocks and varying sizes. The product has advantages, namely the shape of the toy blocks is sturdy when arranged, multifunctional toys, and can be played individually or in groups.

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BIOGRAPHIE

Name: **Nurhayati**
Surname: **Rauf**
Birthday: 21.08.1968
Birthplace: Malakaji, Indonesia
Bachelor: Industrial Engineering and Management, Industrial Engineering Department, Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, 1993
Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Tenth November Institute of Technology, Surabaya, Indonesia, 2002
Doctorate: Operational Management, Management Science, Economics, Indonesian Muslim University, Makassar, Indonesia, 2018
The Last Scientific Position: Assoc. Prof., Department of Engineering Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, Since 2008
Research Interests: Quality Control, Product Development, Ergonomics
Scientific Publications: 10 Papers, 3 Books, 3 Research Projects
Scientific Memberships: Indonesian Lecturer Association, Indonesian Engineers Association

Name: **Ahmad**
Surname: **Padhil**
Birthday: 04.01.1989
Birthplace: Bone, Indonesia
Bachelor: Industrial Engineering, Industrial Engineering Department, Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, 2011
Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Indonesian Islam University, Yogyakarta, Indonesia, 2018
The Last Scientific Position: Assist. Prof., Department of Engineering Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, Since 2018
Research Interests: Macroergonomic, Design Product, Safety and Health
Scientific Publications: 57 Papers, 5 Books, 2 Patents, 6 Projects
Scientific Memberships: Indonesian Lecturer Association, Indonesian Engineers Association

Name: **Dirgahayu**
Surname: **Lantara**
Birthday: 03.03.1959
Birthplace: Ujung Pandang, Indonesia
Bachelor: Machine Engineering, Engineering Department, Faculty of Engineering, Indonesian Muslim University, Makassar, Indonesia, 1988
Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Bandung Institute of Technology, Bandung, Indonesia, 1994
Doctorate: Industrial Engineer, Industrial Engineering Department, Faculty of Industrial Technology, Brawijaya University, Malang, Indonesia, 2014
The Last Scientific Position: Prof., Department of Engineering Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, Since 1989
Research Interests: Ergonomic, Design Product, Safety and Health
Scientific Publications: 60 Papers, 14 Books, 2 Patents, 2 Projects
Scientific Memberships: Indonesian Lecturer, Association, Indonesian Engineers Association

Name: **Dwi Wulandari**
Surname: **Thamsyul**
Birthday: 07.10.2000
Birthplace: Palopo, Indonesia
Bachelor: Industrial Engineering, Industrial Engineering Department, Faculty of Industrial Technology, Indonesian Muslim University, Makassar, Indonesia, 2023
Research Interests: Ergonomic
Scientific Publications: 1 Paper, 1 Thesis, 1 Project