DESIGN OF A BOARD GAME PRODUCT BUSINESS MODEL AS A LEARNING MEDIA FOR ENVIRONMENTAL CARE FOR PRIMARY SCHOOL CHILDREN

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ABSTRACT

Currently the environment is one of the big problems that concern us. The phenomenon of indifference to the environment has a negative impact on human life. One of the efforts to prevent environmental damage is to provide environmental education to elementary school children. Through the observations that have been made, there are triggers for children's indifference to the environment, including difficulties in growing motivation to care about the environment and the ineffectiveness of learning media in providing understanding about the environment. The purpose of this study is to create additional learning media in the form of board game which can increase environmental awareness. The design of this business model uses the method design thinking, value proposition, lean canvas, blue oceans strategy, validation test, and business feasibility test. Design thinking aims to help understand the problems and desires of children aged 7-12 years related to environmental concern. Value proposition canvases aims to offer a design board game with the theme of caring for the environment to help elementary school children understand their surroundings and increase their enthusiasm for environmental learning.Blue oceans strategy aims to create product innovations that are different from competitors including the suitability of educational aspects and suitability for elementary school children's lessons. validation showed that around 79.8% of respondents agreed with the board game concept design. The business feasibility test shows that the profit earned is 5,100,000, - per month. BEP units of 6,39 and payback period of 0,51 months.

Keywords: Board Game, Environmental, Design Thinking, Blue Oceans Strategy, Business Worthed

1. INTRODUCTION

Currently, environmental problems are one of the major problems that concern us. In 2012 World Risk Report released German Alliance for Development Works (Alliance), United Nations University Institute for Environment and Human Security (UNU-EHS) and The Nature Conservancy states that environmental damage is one of the important factors that determine the level of disaster risk in an area [1]. Most of the environmental damage occurs due to deforestation. According to Indonesia's Environmental Status, over the last five years (2014-2019 period), the area of forest land in Indonesia has decreased from 95.7 Ha in 2014 to 94.1 Ha in 2019. One of the factors causing forest logging is due to a lot of new land development instead of planting trees to prevent natural disasters [2].

One effort that can be done in instilling a caring attitude environment, namely environmental education from an early age. This environmental education focuses on building the character of early childhood to understand the importance of the environment in life and how love and care for the environment become values embedded in everyday life [3].

The phenomenon of indifference to the environment in elementary school students can be observed in everyday behavior. For example, children know about environmental damage but they still damage plants and don't take care of them, litter, and don't take part in caring for plants in the school yard [4]. Based on an interview with the MI Al-Wahda teacher in Baubau City, he said that "Not all students are aware of the importance of protecting the environment, so teachers need to constantly remind students, sometimes even students have no will at all to protect the environment."

According to data on the results of implementing the environmental education curriculum in elementary schools, only 50% of students have not been able to realize the results of environmental learning [5]. This data was also strengthened by observations through interviews with MI Al-Wahda teachers in Baubau City who stated that only 50% of the learning media used were not effective in increasing environmental care attitudes. For this reason, in an effort to improve environmental care attitudes for elementary school students, a learning media is needed that can combine learning and playing.

Elementary school students (7-12 years) are included in this phaseconcrete operational According to Piaget, this age is characterized by the development of logical and rational thinking [6]. It would be better if children were given games that have a positive impact on the development of children aged 7-12 years by using the concept of gamification. Gamification is a game-based learning method that aims to foster learning motivation and change children's behavior for the better [7]. According to research conducted by University of Colorado Denver stated that people who studied using the gamification method were able to score 14% higher than those who studied using traditional methods. This is because gamification has 3 main principles that can increase student confidence, be more involved with subject matter and provide responses quickly [8]. The principles and elements of gamification can be seen in the media board game. Board games is a game non electronic which uses boards as the main component, and is supported by other supporting components such as cards, tokens, and so on [9]. As is board game with the theme of caring for the environment can train students in responding to situations about problems in the surrounding environment. Game goals

This education is a means so that elementary school children can increase their sense of concern for the surrounding environment, especially planting trees in the form of board game.

Problems that originate from environmental damage, so that it has a negative impact on human life. One of the efforts to prevent environmental damage is to provide environmental education to elementary school children. Through the observations that have been made, the results of triggering elementary school children's indifference to the environment include the ineffectiveness of the current learning media for elementary school students aged 7-12 years in providing an understanding of environmental concern and difficulties in motivating children aged 7-12 years to care about the environment around.

Therefore the purpose of this research is to design a product business model board game as a learning medium to increase environmental awareness for elementary school children.

2. LITERATURE REVIEW

Learning media is a tool to support the learning process in students. The use of instructional media can increase students' interest in learning new things in the material presented by the teacher so that students can easily understand. Interesting learning media for students can stimulate the learning process [10].

Board games is a type of game where tools or game parts are placed, moved, or moved on a surface that has been marked or divided according to a set of rules [11].Board games included in educational game facilities which can support aspects of child development, for example increasing children's imagination and creativity by detecting game patterns, planning and game strategies to win, and can improve children's brain development including logic skills, communication skills, and develop the ability to focus in the long term long time.

A business model is a planned set of assumptions about how the company will create value for all of its stakeholders. A business model describes the rationale for how organizations create, deliver, and capture value [12].

Design thinking is a method of thinking and acting to find creative solutions. Design thinking very attached to humans in the innovation process which emphasizes observation, collaboration, quick grasp of new things, visualizing ideas, and business analysis, which have a major impact on innovation and business strategy [13]. There are five stages in design thinking namely Empathize, Define, idea, Prototype and test.

Value proposition canvases is an analytical method used to explain and create value and benefits for consumers. Value proposition canvases consists of two blocks business model canvas that is value proposition and customer segment. On the left block in the form of a box there is pain relievers, gain creators, And product or service. Meanwhile, in a circle- shaped block there is customer jobs, pain, and gain.

Lean canvas is a tool used to rapidly design and develop business models. Lean cavas consists of 9 blocks consisting of problem, customer segments, unique value proposition, solution, channels, revenue streams, cost structure, key metrics, and unfair advantage[14].

Blue Oceans Strategy aims to identify and explore new market opportunities that have not been realized by other players. This strategy makes it possible to create a market space that is free from competitors. There is an

analytical framework blue oceans[15] namely strategy canvas, Four-step framework, Remove-Reduce-Upgrade-Create scheme, and Utility map.

Minimum Viable Product aims to validate business ideas, evaluate consumer experiences, and obtain product-related feedback. The results of this feedback will be used to improve and develop the final product [16].

Validation test is an important component because it is a method that aims to prove whether the designed business is valid or not. Data collection in this validation test was carried out using a questionnaire to assess the design minimum viable product (MVP) that has been pre-designed.

The business feasibility test aims to consider whether a business is feasible or not to run from a financial perspective. In this study using calculations by looking for fixed costs, variable costs, costs start up, break event point and payback period.

3. METHOD

The research methodology explains the stages in the research to solve existing problems so as to obtain the expected results of the new product design. The initial stage of the research was preliminary research which aimed to identify problems related to learning media regarding environmental awareness for elementary school children aged 7-12 years including collecting information related to complaints from students' parents, elementary school teachers, and information relating to elementary school children. Then data collection was carried out on prospective users using aquestionnaire. The next stage of literature study is used for activities to collect information in accordance with the theoretical basis, the methods used in research through various reference sources including those from journals related to the research topic. Problems that start from a lack of concern for elementary school children towards the environment, so that it has a negative impact on the surrounding environment, especially in plant conservation. Through the results of observations made on the parents of students and elementary school teachers, it was obtained that elementary school children's indifference to the environment in everyday life as they know about environmental damage but they still damage plants and don't take care of them, litter, and don't participate in maintain plants in the school yard, so needed thus having a negative impact on the surrounding environment, especially in plant preservation. Through the results of observations made on the parents of students and elementary school teachers, it was obtained that elementary school children's indifference to the environment in everyday life as they know about environmental damage but they still damage plants and don't take care of them, litter, and don't participate in maintain plants in the school yard, so needed thus having a negative impact on the surrounding environment, especially in plant preservation. Through the results of observations made on the parents of students and elementary school teachers, it was obtained that elementary school children's indifference to the environment in everyday life as they know about environmental damage but they still damage plants and don't take care of them, litter, and don't participate in maintain plants in the school yard, so needed tools which can help elementary school children understand the importance of protecting the environment.

Therefore, to form a caring attitude towards the environment, a solution is needed that can help parents and elementary school teachers increase children's awareness and interaction with the environment by creating additional learning media in the form of board game which raised the issue of environmental concern, especially tree preservation.

Therefore, designed a product board game as a learning medium to increase environmental awareness for elementary school children. The next stage of data collection is carried out to obtain the data needed to achieve the research objectives. The data needed includes primary data and secondary data. Primary data including the results of the questionnaire empathy map, questionnaire customer job, and questionnaires solution validation. Secondary data includes the results of interviews with elementary school teachers and elementary school students.

At the data processing stage, starting with the stage empathize which at this stage discusses the problems of parents and teachers related to elementary school children who do not care about the surrounding environment and look for what these parents and teachers want by using empathy map. Stage define, aims to introduce elementary school children in detail by distributing questionnaires to find out the problems faced by them so as to produce results jobs to be done. Stage ideate, designing value proposition

canvas with the aim of creating value that suit consumer needs. Stage prototype, develop the concept of a business model using the method lean canvas, competitor analysis, and blue ocean strategy. Blue ocean strategy used to develop strategies to determine the uniqueness of products designed to compete with other competitors.

Stage testing, make arrangements minimum viable product (MVP) includes product mechanics, product components, and gameplay. The validation test phase, at this stage testing is carried out on the product to ensure that the solution chosen is in accordance with the wishes of parents, teachers and elementary school children. The business feasibility test phase is reviewed from the financial aspect to find out whether this business can run or not by carrying out calculations to find the amount of fixed costs, variable costs, startup, break event point and payback period.

4. RESULTS AND DISCUSSION

4.1 Emphatize

The empathize stage is carried out by identifying the needs of the target community group. This stage is very important to do to explain the problem to be solved. The data used comes from the results of questionnaires distributed online to parents and elementary school teachers with a total of 18 respondents. The distribution of this questionnaire aims to find out the problems that are felt by parents and teachers while teaching environmental awareness to elementary school students aged 7-12 years both at school and at home.

Table 1. Problem Based Research Subject

Parent	Children	Teacher
Parents can't wait to accompany their children to learn	Feeling bored with the education system provided	Lack of student attention during environmental lessons in class
Lack of time with children	Lack of focus in participating in environmental education learning	The lack of learning media provided by schools to support environmental care education
Difficulties in growing children's learning interest	Children prefer to play	Students lack discipline in implementing environmental education
Home environment that does not support the implementation of protecting the environment	Lack of children's exploration of the surrounding environment	Lack of practical activities in environmental education

Table 2. Problem Based Development of Children’s Learning

Psychomotor	Cognitive	Affective
Fulfilled	**Fulfilled**	**Unfulfilled**
Practical activities directly in implementing environmental subject matter	Limitations of educational learning materials care for the environment	Students are less interested in explaining the theory
Lack of interaction between children, teachers and parents in the application of enviromental awareness	The environmental education subject matter is in the form of theory	Students lack discipline in applying environmental care attitudes

The results of distributing questionnaires to 18 respondents resulted in problems for parents and teachers related to environmental education, including:

Parent: Children have not found the motivation to care for the environment so there is still much to be directed to care for the environment, applying the discipline of disposing of trash in its place, classifying waste based on its type, and the lack of time for parents to teach environmental care to children.

Teacher: Learning systems related to environmental concern are still not running effectively due to the lack of subject topics that focus on the environment, lessons that have not been scheduled consistently, facilities in schools that are

less supportive and a lack of student discipline in implementing the importance of protecting the environment. This results in the appearance of laziness and indifference in protecting the surrounding environment.

Primary school children: The learning system is still not effective because teachers in schools still use the lecture method, this results in a feeling of boredom in children. In addition, information related to environmental concern is less understood by students.

Then proceed with studying further the consumer characteristics of the product *board game* and assist in solving product problems related to consumer needs by using Empathy Maps. Empathy *Maps* using the concept of a square which is divided into six quadrants.

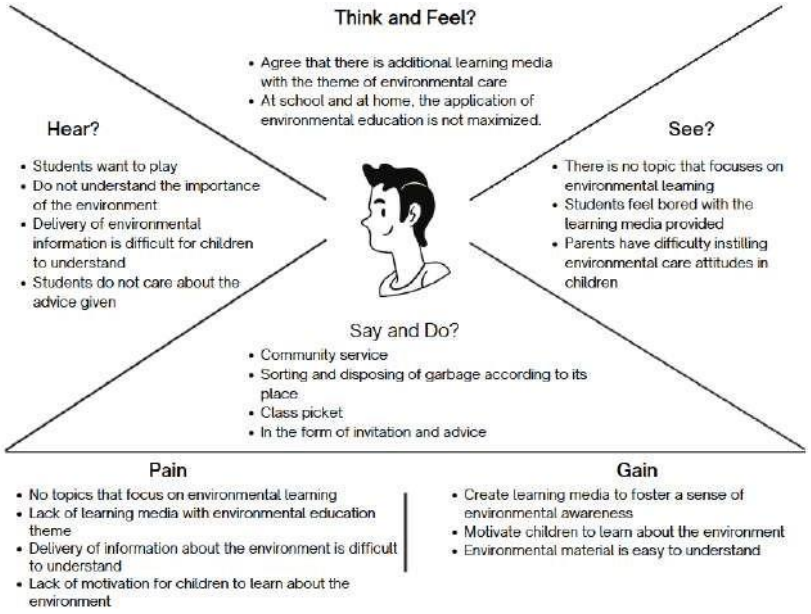

Figure 1. Emphaty Maps Environmental Care Education

4.2 Define

Stage define the process of analysis and understanding of the problems that exist in customers. At this stage using the method job to be done and data from questionnaires filled in by elementary school children aged 7-12 years with a total of 25 respondents aged 7-12 years and using problem data that has been concluded at the empathize.

Table 3. Job To Be Done product board game environmental education

Emotional Criteria		
Designing board game with the theme of caring for the environment which can support aspects of education for elementry school students		
(Personal)	**(Social)**	**(Objective)**
Educational media made with the theme of games that can increase a sense of self-discipline to care for the environment and can support affective, psychomotor, and cognitive aspects for elementry school students	Educational media that can eliminate boredom in students while studying, become a means of entertaiment, and student can actively interact with each other both among friends, teacher, and family	Educational media that is easily understood by elementry school students to help develop character and an understanding of the importance of caring for the environment

From table 2 above it was obtained through the results of a questionnaire distributed to 25 elementary school child respondents. For terms *personal*, students need additional learning media that can increase students' sense of discipline in applying a caring attitude towards the environment and can support these aspects of student education. For that it

is necessary *board game* environmental education theme. For terms *social*, students need additional learning media that can eliminate boredom while studying, become a means of entertainment, and students can actively interact with each other with friends, teachers, and family in learning about the environment. For terms *objective*, students need additional learning media that are easy to understand at the elementary school level to help them grow character and understanding of the importance of caring for the environment.

To understand the target audience, customer personas are then created. The customer persona of this board game product design is elementary school students in grade 2 aged 8 years, parents who have children aged 7-12 years and elementary school teachers who need tools in teaching environmental awareness to children aged 7-12 years.

Figure 2. Customer Persona Elementary School Kids

Figure 3. Customer Persona Parent

Figure 4. Customer Persona Elementary School Teacher

4.3 Ideate

The third stage is to make a transition from the formulation of the problem that has been described in the first stage *define* be a solution. At this stage creativity is needed to produce ideas or ideas as the basis for the next stage. This method is used to design in detail about a product or service that will be made so as to create value and benefits for customers.

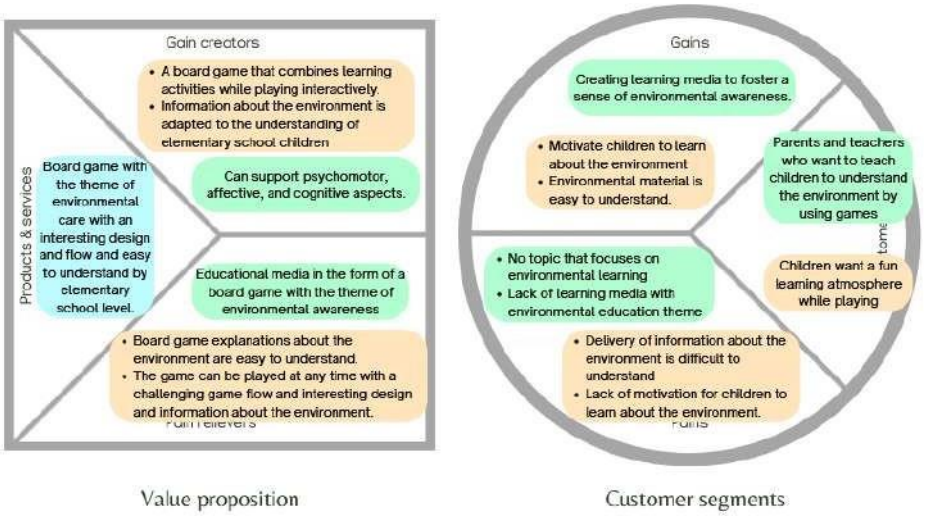

Figure 5. Value Proposition Canvas

In the pains obtained, it is difficult to provide an understanding of the environment because there is no topic that focuses on environmental learning, children feel bored learning the environment, learning media with environmental education themes are less interesting, and the language used in conveying environmental information is difficult for children to understand. On gains, environmental material is easy to understand, motivates student learning, and can foster a sense of environmental awareness. The customer job(s) contains

the desire of parents and teachers to teach their children understand the environment using games and children want a learning atmosphere that wins while playing.

the value proposition block there are gain creators, pain creators, and product and service. In the gain creators section, a board game is obtained that can combine learning activities while playing interactively, can support educational aspects, and environmental information in accordance with the understanding of elementary school children. In the pain creators section, educational media is obtained in the form of an environmental theme board game, an explanation of the environment is easy to understand, and the game can be played at any time with challenging gameplay and attractive design. In the product and service section, a boardgame product with the theme of environmental care is obtained with an attractive design and gameplay that is easily understood by elementary school students.

4.4 Prototype

Lean canvas aims to identify problems to develop effective solutions. In this method, 2 kinds of lean canvas are made with 2 customer subjects, namely parents and teachers. This is because parents and teachers are directly related to the main customer, namely children aged 7-12 years old at the elementary school level.

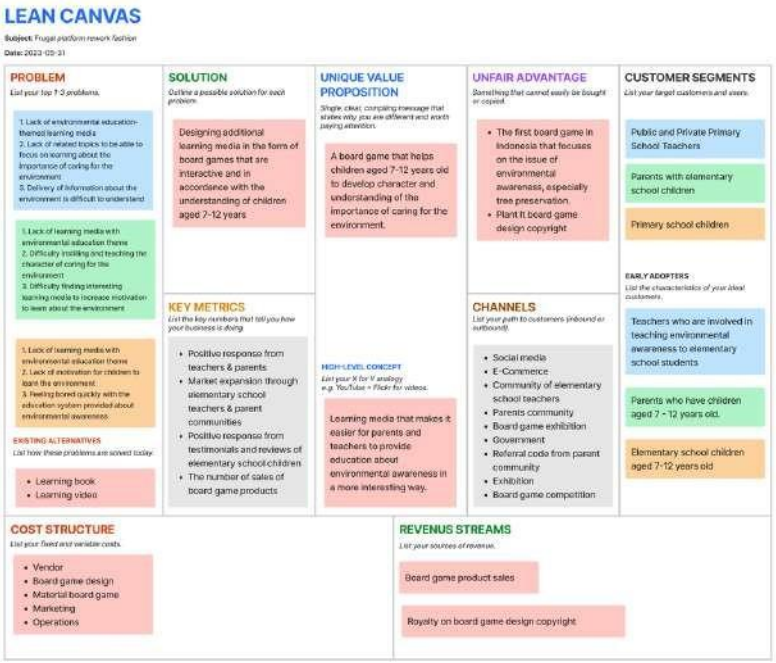

Figure 6. Lean Canvas

Competitor analysis is used to compare the product developed with several other competing products. Competitors that have similar products with environmental themes are Eco-funopoly, and Wilah!.

Table 4. Initial Competitor Analysis

Indicator	Plant It	Wilah!	Eco-funopoly
Price	IDR 600.000	IDR 150.000 - 300.000	IDR 350.000 - 2.000.000
Design	Snackes and ladders	Card	Monopoly
Material	Cardboard	Paper	Recycled material
Game Components	Card, board, tokens, spinners	Card	Card, board, dice, tokens
Rules Book	Complete	Quite complete	Complete
Age Range	7-12 years	7+ years	9+ years
Number of Players	2 - 4 Players	2 – 4 Players	2 - 4 Players
Game Duration	30 minutes	5 - 15 minutes	30 minutes

Blue ocean strategy is a method of creating new market segments that have not been carried out by other competitors in order to create new competition.

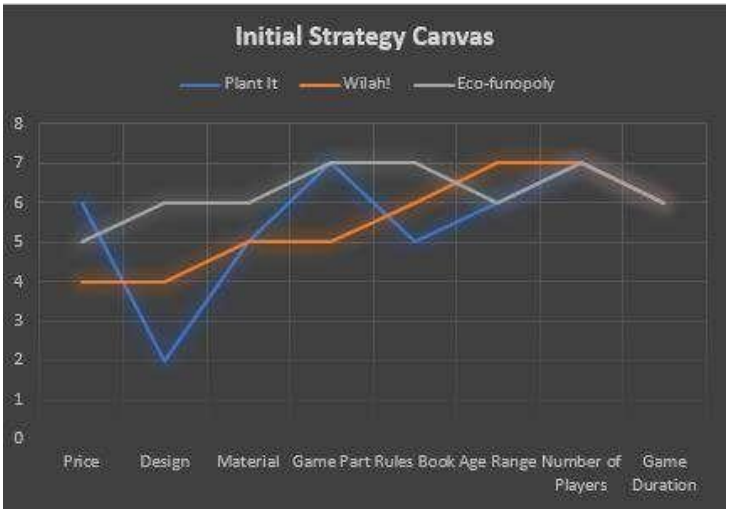

Figure 7. Initial Strategy Canvas

Table 5. 4 Step Framework

4 STEP FRAMEWORK STRATEGY	
Eliminate	**Raise**
Eliminate the notion that environmental lessons are boring	Materials used in the game
	Design board game
	Product price
Eliminates complicated rules and instructions to ensure simplicity and accessibility for children	Game rules book
	Raise awareness about environmental issues by integrating real-world examples and stories about their impact
	Increase the level of excitement in learning about nature and environmental conservation
Reduce	**Create**
Reduce emphasis on competencies to minimize stress and foster a collaborative learning environment	Add information related to environmental damage factors in language that is easy to understand
	Learn to group colors and add new vocabulary, as well as count in a simple way
	Can train children's fine motor skills and hand and eye coordination
	Added information regarding organic waste that can be converted into fertilizer for plants
Reduces the complexity of environmental concepts, breaking them down into child-friendly themes	Train children's sensitivity to phenomena regarding environmental damage
	In accordance with environmental lesson topics for elementary school children
	Create a compelling storyline with characters, challenges, and mysteries that revolve around environmental issues

	Create interactive activities, encouraging children to explore nature and make environmentally friendly decisions

After conducting competitor analysis, proceed with drawing the initial strategy canvas. In the figure Plant It is represented in blue indicating that the product Plant It have a shortage of design, materials, rules book so that improvements are needed to improve product development board game Plant It.

Table 6. Final Competitor Analysis

Indikator	**Plant It**	**Wilah!**	**Eco-funopoly**
Price	IDR 700.000 - 1.300.000	IDR 150.000 - 300.000	IDR 350.000 - 2.000.000
Design	Snackes and ladders	Card	Monopoly
Material	Wood	Paper	Recycled material
Game Components	Card, board, tokens, spinners	Card	Card, board, dice, tokens
Rules Book	Complete	Quite complete	Complete
Age Range	7-12 years	7+ years	9+ years
Number of Players	2 - 4 Players	2 – 4 Players	2 - 4 Players
Game Duration	30 minutes	5 - 15 minutes	30 minutes
Cognitive Aspect	Yes	No	No
Affective Aspect	Yes	No	No
Psychomotor Aspect	Yes	No	No
Elementry School Subject	Yes	No	No

Figure 8. Final Strategy Canvas

In the final strategy canvas image above, after the repairs were made there was an increase in the graphic where the product *Plant It* superior to the indicators *design*, materials, and *part* game. Besides that product *Plant It* designing new innovations that involve all aspects of education (cognitive, affective, and psychomotor) for children aged 7-12 years and suitability for Elementary School level subjects so that the overall product *Plant It* superior to other competitors.

4.5 Testing

Minimum Viable Product

Minimum viable product aims to provide an overall picture related to products designed to consumers. MVP is delivered to consumers by explaining it directly to elementary school children and complete with trial documentation prototype. The results of the trial are used as a reference whether they are interested in the product designed in the learning activities later.

Figure 9. Prototype Whole

In the picture above is the result of the design *prototype* overall. *Prototype* it covers all the main components in the game. *Prototype* this will then be used to validate the experience of the elementary school child as a whole.

Product Components

Figure 10. Board

Figure 11. Token Tree

Figure 12. Spinner

Figure 13. Token Rubbish

Figure 14. Rules Book

Figure 15. Card Game

Board rectangular in shape, consisting of 4 areas on each side with visualization empty land. *Spinners* used by playing to determine the pace of the game. The game cards consist of water cards and fertilizer cards that can fill barren lands as well as opportunity cards that contain interesting information about the environment. The tree token is used as a tree symbol. Garbage tokens are used to exchange for fertilizer cards. And the rules book as a guide to the flow of the game.

Product Mechanism Board Game

Mechanism *board game* Includes game components *board game* that is *action, goals*, and *resources*: The following is a diagram of the game mechanism *board game*:

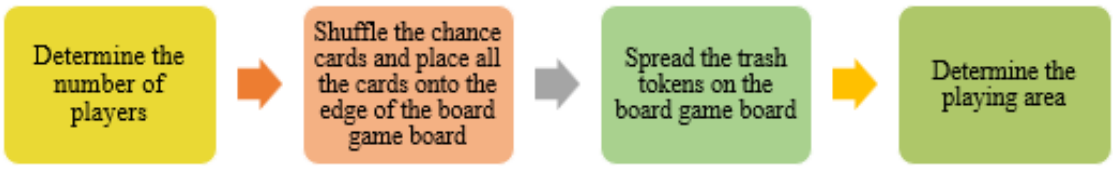

Figure 16. Early Stage Game

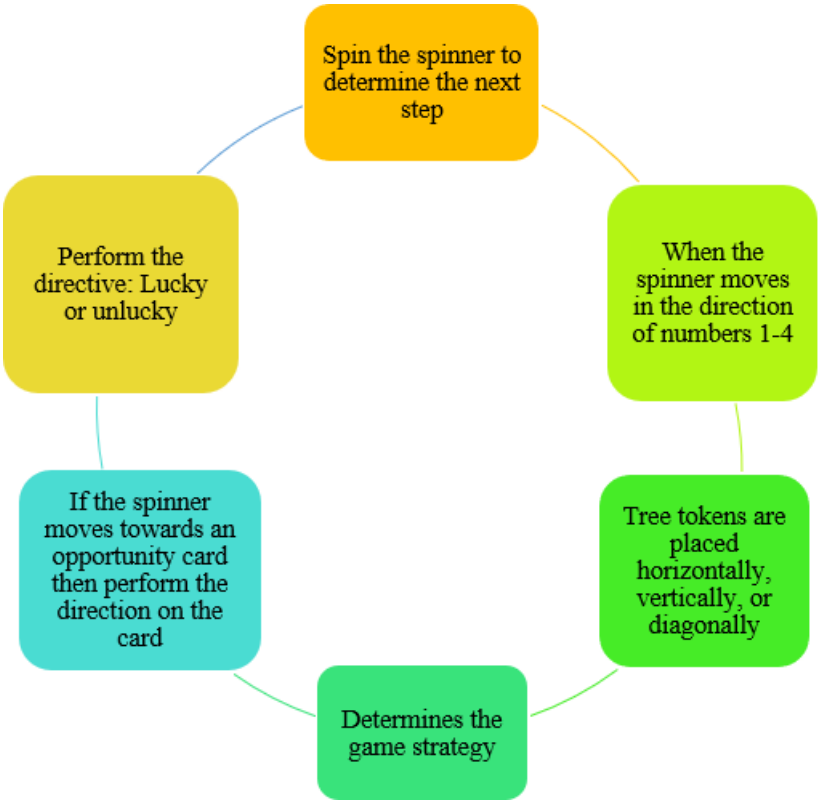

Figure 17. Game Core Stage

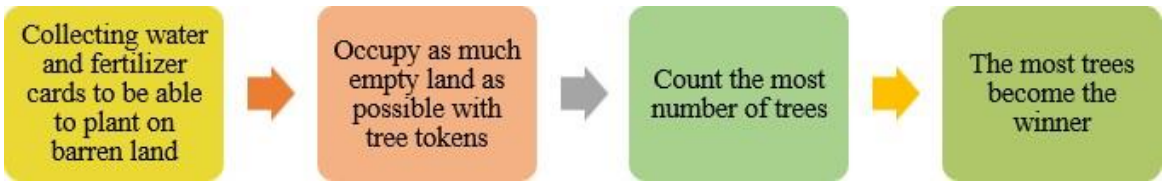

Figure 18. Final Game Stage

Validation Test

Validation test is a stage in product development where the prototype design is tested as a whole to ensure that the product being developed is in accordance with the needs of the target user. The validation test carried out directly carried out by 3 elementary school students directly related to product introduction and game testing.

Figure 19. Validation Test (1)

Figure 20. Validation Test (2)

Figure 21. Validation Test (3)

Figure 22. Validation Test (4)

Figure 23. Validation Test (5)

Figure 24. Validation Test (6)

Table 7. Explanation of Product Trials on Aspects of Children's Education

	Figure	Instruction
Affective	19, 20, 23	Children mutually respond to phenomena related to the causes of environmental damage and the benefits of trees for the environment. The child is sad when the tree is lost due to information on illegal logging on the chance card.
Psychomotor	19, 22, 23	Train hand and eye coordination, fine motor skill of children such as the ability to hold tokens, rotate spinner.
Cognitive	19, 21, 24	When they read the chance cards they find new sentences that can increase vocabulary, count the number of trees, group colors on tree tokens.

Furthermore, parent and teacher validation questionnaires were distributed aiming to find out whether consumers were interested in the designed product. This questionnaire uses a Likert scale to measure the level of consumer acceptance of the product. This questionnaire was distributed for a week in order to get accurate results.

Table 8. Validation Questionnaire

No	Question	Strongly Disagree	Don't Agree	Neutral	Agree	Strongly Agree
1	Can the board game Plant It help you give children an understanding of the environment?					
2	Is the game play of the Plant It board game easy to play and understand for children aged 7-12 years?					
3	Does the Plant It board game design have an attractive appearance?					
4	Does the Plant It board game have a complete game component?					
5	Is the material ised in the Plant It board game of good quality?					
6	Can the board game Plant It get rid of children's boredom while studying?					
7	Does the Plant It board game help children learn whilw playing?					
8	Can the board game Plant It be used as additional learning media for children at home/school?					
9	Can the board game Plant It be played with friends and family as a means of interaction?					
10	Do you agree to buy Plant It products as a medium for children's learning at home/school?					

Table 9. Respondent Decision Results

Question	Scale					Total	Total / Respondents	Information
	5	4	3	2	1			
1	70	56	6	0	0	132	4.13	Strongly Agree
2	55	60	12	0	0	127	3.97	Strongly Agree
3	55	60	12	0	0	127	3.97	Strongly Agree
4	50	56	18	0	0	124	3.88	Agree
5	50	60	15	0	0	125	3.91	Strongly Agree
6	75	56	3	0	0	134	4.19	Strongly Agree
7	75	56	3	0	0	134	4.19	Strongly Agree
8	75	48	9	0	0	132	4.13	Strongly Agree
9	75	56	3	0	0	134	4.19	Strongly Agree
10	50	24	15	18	0	107	3.34	Agree
Total	Percentage of Overall Questionnaire						3.99	Agree
							79,8%	Agree

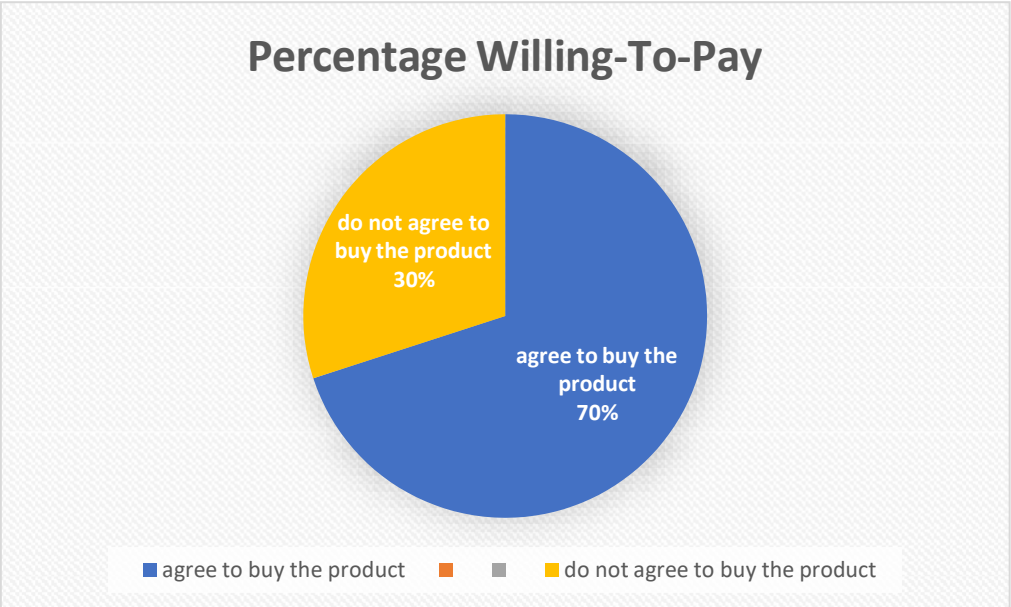

Figure 25. Percentage willing-to-pay

From the results of distributing the questionnaires, it was obtained 30 elementary school child respondents consisting of 66.7% parents and 33.3% elementary school teachers. The results of the questionnaire obtained were then processed using a Likert scale to produce the table above. Of the 10 questions it was concluded that 8 questions the respondents stated "strongly agree" and 2 questions stated "agree". With a total average number on each question as a whole of 3.99 or 79.8%. For the "Agree" scale, it means that the respondent agrees to buy this product at a percentage willing-to-pay by 70%.

Board Game Product Business Model

The business model canvas is a framework used to comprehensively describe the key elements of a business or business idea in a single view. The business model framework includes nine key elements that form the foundation of a business:

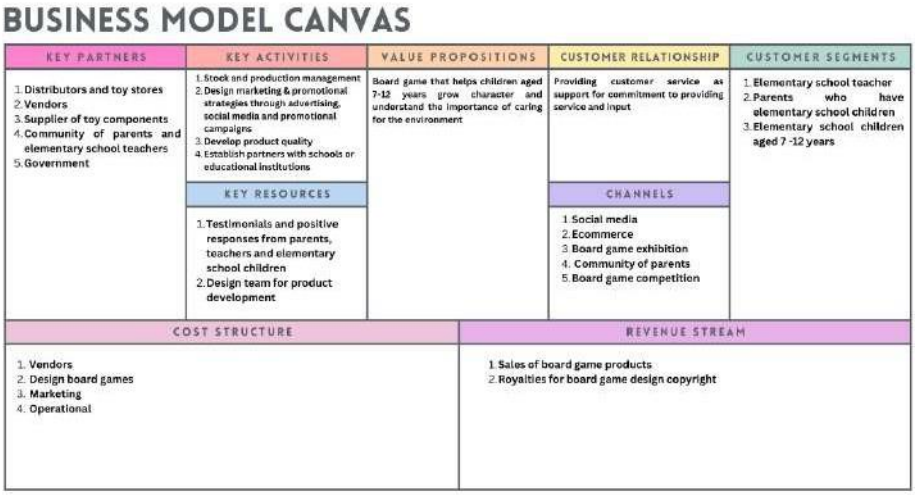

Figure 26. Business Model Canvas

Marketing Strategy

Market segmentation is the process of dividing an overall market into smaller, more targeted groups based on similar characteristics, needs, or behaviors. Plant it board game market segmentation includes:

1. Market segmentation for parents :

Demographics:

a. Age: 25-45 years old
b. Education: Varies, but usually with higher or secondary education.
c. Income: Middle to upper class.
d. Location: Urban or suburban with high environmental awareness.

Characteristic:

a. Parents who care about their children's education and development.
b. Parents who are very busy
c. Looking for alternatives to toys that support learning and positive values.
d. Desire products that teach environmental awareness.

Desired Benefits:

a. Educational products with strong environmental values.
b. Games that can be played together with children and support family interaction

2. Market Segmentation for Elementary School Children (7-12 years old):

Demographics:

a. Age: 7-12 years old.
b. Education: Elementary school.
c. Location: Various, but more focused on urban and suburban areas.

Characteristics:

a. Active children who want to learn in a fun way.
b. Those who have an interest in the environment and care about global issues.

Desired Benefits:

a. Educational and attention-grabbing games.
b. Products that provide opportunities to learn about environmental issues and how they can contribute.

3. Market Segmentation for Schools:

Demographics:

a. Level: Elementary school.
b. Position: Teacher or staff involved in curriculum development and extracurricular activities.

Characteristics:

a. Products support the curriculum and teach environmental values.
b. Looking for educational materials that can be integrated into the curriculum.

Desired Benefits:

a. Products that support the education curriculum and teach environmental values.
b. Games that can be used in classroom learning activities or as extracurricular activities.

Proposed Board Game Product Creation

1. Selection of more affordable materials: Identify the main components of the board game and review the type of material used. The use of thick cardboard material with attention to the best quality of the board game board.
2. Design simplification: Simplify the design of the board game and other components. Reduce elements that are not critical and tend to increase production costs. This can help reduce production costs and production time.
3. Reduction of additional components: Revisit additional elements such as packaging, or bonus components that do not really matter. Focus on core components that actually add value to the gaming experience
4. Use of lighter materials: Consider lighter materials for components such as cards, tokens, and spinners. Lighter materials can reduce shipping and production costs
5. Use of lighter materials: Consider lighter materials for components such as cards, tokens, and spinners. Lighter materials can reduce shipping and production costs.
6. Determining the right production quantity: Choose realistic production quantities based on market demand and business goals. Reducing production quantities where necessary can help avoid wasting materials and costs.

Business Feasibility Test

The business feasibility test aims to calculate the financial aspects of a business plan that has been designed and passed the validation stage.

Table 10. Variable Cost

Variabel Costs					
Item	Unit Cost		Qty	Total Cost	
Sticker 30x30	IDR	30,000	1	IDR	30,000
Board	IDR	50,000	1	IDR	50,000
Cutting Wood	IDR	100,000	1	IDR	100,000
Sticker A3	IDR	30,000	1	IDR	30,000
Fun Fact Card	IDR	2,000	33	IDR	66,000
Water Card	IDR	2,000	20	IDR	40,000
Fertilizer Card	IDR	2,000	20	IDR	40,000
Rule Book	IDR	2,000	8	IDR	16,000
Red 3D Token	IDR	3,000	50	IDR	150,000
Blue 3D Token	IDR	3,000	50	IDR	150,000
Yellow 3D Token	IDR	3,000	50	IDR	150,000
Green 3D Token	IDR	3,000	50	IDR	150,000
Trash Token	IDR	3,000	18	IDR	54,000
Total				IDR	1,026,000

Table 11. Fixed Cost

Fixed Costs (for a month)		**Cost**
Customer Service	IDR	1,500,000
Electricity & Cleaning	IDR	175,000
Promotion	IDR	75,000
Total	IDR	1,750,000

Table 12. Start Up Cost

Startup Costs		**Cost**
Design Services	IDR	2,100,000
Legality	IDR	500,000
Total	IDR	2,600,000

The total costs incurred include costs *startup*, fixed costs, and variable costs. The total spent to run the business is IDR 5,376,000,-.

Table 13. Number of Customers

Customers (per day)	**No. of days**
1	25

Table 14. Revenue Stream

Revenue		
Number of customers		25
Unit per customer purchased		1
Price per unit (in your currency)	IDR	1,300,000
Purchase frequency during month		1
Total sales in units		25
Total sales revenue	IDR	32,500,000

Table 15. Summary

SUMMARY		
Variabel Cost	IDR	1,026,000
Startup Cost	IDR	2,600,000
Fixed Cost	IDR	1,750,000
Total	**IDR**	**5,376,000**
Revenue	IDR	32,500,000
Profit	**IDR**	**5,100,000**
Breakeven		**6.39**
Pay back period (months)		**0.51**
Contribution (margin)		**274000**

In table 15, you can see a summary of the financial flow, where the profit (Profit) you get in a month is IDR 1,075,000.-. Expenses of IDR 5,376,000,- and income of IDR 32,500,000.-.*Break Event Points*(BEP) will be achieved if 6,39 units of products are sold. *Payback period* of business is estimated for 0,51 months. So it is concluded that the business is feasible to run

CONCLUSION

The game model for environmental education is intended to solve problems in the introduction, understanding and application of learning to elementary school children. This game model fosters a love for the environment so that cognitive, affective and psychomotor effects are in accordance with the development of elementary school children in the digitalization era. At stage empathy map there are 4 main problems namely there are no topics that focus on environmental learning, lack of learning media themed environmental education, delivery of information about the environment that is difficult to understand and lack of motivation to learn about the environment. On value proposition canvas, designing gain creators in order to be able to integrate learning activities while playing interactively, information about the environment is adapted to the understanding of elementary school children and supports cognitive and psychomotor aspects. Pain relievers made to overcome pain obtained from customers. then on products & services create an educational game in the form of board game about environmental concern for elementary school children with an attractive appearance and gameplay. On lean canvas hows that product design board game This is so that it can assist teachers and parents in overcoming problems faced related to the lack of environmental concern for elementary school children. On blue ocean generate a plan board game Plant It which is superior to support aspects of education (cognitive, affective, and psychomotor), and in accordance with the lessons of elementary school children. Apart from that, in terms of design, materials, game components, the number of games are stated to be superior compared to other competitors. The validation test shows that the results of the respondents' decisions on the 10 statements distributed stated 8 questions "strongly agree" and 2 questions "agree". It can be concluded that the scale strongly agree means board game Plant It can help parents and teachers to

provide an understanding of the environment, relieve boredom, and be easily understood by elementary school children. So that the validation test is declared valid, with an average total respondent weight of 3.99 or 79.8%. The business feasibility test shows that the selling price of the product is IDR 1,300,000,- per unit, with a monthly profit of IDR 5,100,000. Break Event Points (BEP) will be achieved if 6,39 units of products are sold. Payback period of business is estimated for 0,51 months. So it is concluded that the business is feasible to run.

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