

Development of Snake Ladder Game as a Health Promotion Medium for School-Aged Children in Pamulang Barat Elementary School

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Abstract

The purpose of this study was to determine the feasibility of health promotion media for snake and dental health ladder games for school-age children in Pamulang Barat Elementary School in 2019. The research method used is Research and Development method which uses 45 samples of third grade students in Pamulang Barat Elementary School with the distribution of 10 students in the first try and 35 students in the field trials. The results of this study are results of the assessment of 2 material experts obtained an average score of 42 or 84%. The results of the assessment of 2 media experts obtained an average score of 73 or 73%. The results of the assessment of responses from students in small group trials the average score is 51.3 with an assessment percentage of 98%. The average score of response assessment of 35 students in a large group is 52.8 with 96% assessment percentage. This research shows that the game of snakes and ladders for oral health is categorized as "Worthy" assessed from the media aspect by media experts and learning aspects by material experts. Student responses to the snake and tooth health mouth ladder game can be categorized as "Very Good".

Keywords: Dental Mouth Health, Health Promotion, Snakes and Ladders Game, Research and Development.

INTRODUCTION

A Riskesdas report in 2013 on the prevalence of dental and mouth problems in the last 12 months in Banten was 23.7%, which received treatment from dental, medical personnel by 33.1% and for effective medical demand (EMD) which was 8.9%.

According to riskesdas results in 2013, the proportion of the population aged 10 years and over is mostly (97.1%) brushing their teeth every day. The areas with the highest proportion are South Tangerang City (98.9%) and the lowest in Serang Regency (95.3%). Most residents also brush their teeth during the morning shower, which is 96.9% with the highest order in Pandeglang Regency at 98.3%, and the lowest in the City of Cilegon at 95.6%. Most residents brush their teeth every day during a morning shower or afternoon shower. Mistaken habits are almost evenly higher across age groups. The correct habit of brushing the teeth of Banten residents is only 1.5%, South Tangerang City is highest for proper brushing behavior at 4.5%. These results illustrate that most of the population still does not have the correct behavior in terms of brushing teeth at the right time. This can have an impact on poor dental and oral health (Riskesdas, 2013).

Dental health maintenance efforts in school-age children are very important because at this age the child is undergoing the process of growth and development. The condition of the children's teeth will affect the development of dental health in adulthood. Therefore, dental and oral health education measures from an early age are needed. Nurhidayat, stated that one form of effort to minimize existing morbidity is by taking preventive measures through health promotion activities (Nurhidayat, et al, 2012).

According to Sriningsih in (Hendrik Mentara 2017: 59) explained that ladder snake games can be given to children aged 5-6 years in order to stimulate various areas of development such as cognitive, language and social. Language skills that can be stimulated through this game such as vocabulary up and down, back and forth, up and down and so on. Social skills trained in this game include willingness to follow and obey the rules of the game, playing in turns.

Some studies show positive results on the development of snake ladder games. Vandiana's research, (2017) shows that the learning media in the form of ladder snake games on

biodiversity material are very feasible to use by obtaining a percentage of eligibility from media experts from validator I by 87% and in media, validator II getting a percentage of 81%. Feasibility of the problem on biodiversity material obtained a percentage from validator I of 73% and from validator II get a percentage of 75% with decent criteria. Media eligibility after the trial was obtained 92% and 95% by teachers and 87% by students. While the research of Rifki Afandi, (2015) Student learning motivation on the aspect of interest shows 26% of students who have motivation to learn in IPS learning, while after applying the media of learning snake ladder game on the aspect of interest shows 100% of students have learning motivation.

MATERIALS AND METHODS

The type of research used is research & development. Using the ADDIE model there are five stages, namely Analysis, Design, Development, Implementation and Evaluation. This study was conducted at Pamulang Barat Elementary School for 2 days on April 29 and 30, 2019. The study was conducted on students / students of class III as many as 45 respondents. Data collection is done by conducting a validity test by 2 material experts and a test of the validity of 2 media experts against the game of snakes ladders dental and oral health, this validity test is done to find out the feasibility of media that will be used as a promotion of dental and oral health. Then after that, a small group trial was conducted on April 29, 2019 to 10 grade III students with a division of 3 people with good ability, 3 moderately capable people, and 4 people with less ability. On April 30, 2019, a large group trial of 35 grade III students was randomly selected with a proportion of 11 students in class A, 12 students of class B, and 12 students of class C.

Data Collection Techniques

Data collection is done by providing validity questionnaires to material experts and media experts to then be given a product feasibility score. Then provide a questionnaire of responses to students to products used as a medium of health promotion.

Research Instruments

The instruments used in this study are:

1. The material expert validation questionnaire given to 2 dentists contains 10 statements from the learning aspects related to dental and oral health materials.
2. The media expert validation questionnaire given to 2 graphic designers contains 20 statements from the media display aspect.
3. Student response assessment sheet given to 45 grade III students divided into 2 groups, namely 10 students in small group trials and 35 students in large group trials contains 11 statements about student responses to dental and oral health promotion media.

Media Feasibility Assessment Data Analysis Data Analysis Techniques

The media feasibility analysis of the ladder snake game aims to measure the assessment of the learning aspect, the media display aspect, and the student's assessment of the media. The scale of measurement of product development research used is the Likert scale with five alternative answers (very good / decent, good / decent, enough, less good / decent, very less good / decent). Assessment criteria for media eligibility and responses are expressed in percentages calculated using the following formula:

$$\frac{\text{average number of scores obtained}}{\text{maximum number of scores}} \times 100\%$$

(1)

Table 1. Percentage Score of Product Feasibility Assessment and Student Responses

| No | Value (%) | Qualification (Eligibility and Response) |
|----|-----------|--|
| 1 | 80 – 100 | Very decent/very good |
| 2 | 66 – 79 | Decent/good |
| 3 | 56 – 65 | Decent enough/good enough |
| 4 | 46 – 55 | Less worthy/less good |
| 5 | 0 – 45 | Not worth it/very bad |

(Source: Arikunto, in Dini Shafia 2017)

RESULTS AND DISCUSSIONS

Development Snakes Ladder Game Media

1. Analysis

At this stage, an analysis was conducted to determine the students' needs to learn about dental and oral health. The researcher chose the media of snake and ladder game so the students could be more enthusiastic in learning material about dental and oral health.

2. Design

This stage is divided into three stages, namely:

a. Planning of the design product

The boxes contained in the dental and oral health ladder snake are 45 boxes, each divided into 2 sides.

b. Game Rules and Materials

The game of snakes ladder, dental and mouth health has the same rules as the rules of the game snake ladder in general that each player runs has pieces according to the numbers that appear on the results of the dice throw. But in this game, the player is asked to choose the correct statement contained in the box that is divide into two sides, namely one side of the correct statement and one side of the false statement, If the player gets a tile of stairs then the player must answer the correct statement so that the player has the right to rise by the plot of the end of the ladder image the player answers the wrong the player is not entitled to go up to the tip of the ladder, and if the student answers the false statement on the map depicting the snake tail then the player must move his piece down to the plot designated by the head of the snake.

c. Development Product Assessment Instruments

The next stage is to make a questionnaire to assess the health promotion media, which will be given to material experts, media experts, and third-grade students at Pamulang Barat Elementary School.

3. Development

This stage includes the making process media that has been designed using application Adobe Photoshop CS5. After the media design is complete, the next step is to print the media using Art Carton measuring 30x42 cm. The products that have already been made are validated by media experts and material experts and then tested on third-grade students.



Figure 1. Product Display Before Validation



Figure 2. Product Display After Validation

4. Implementation phase

At this stage, the this product is developed according to the circumstances, specially in the classroom in conducting health promotion, and this activity consists of :

a. Small-Group Trial

At this stage, the product has been tested on 10 third-grade students of Elementary School Pamulang Barat they are not the sample in this study for field trials consisting of 3 high-ability students, 3 medium-ability students, and 4 low-ability students. The choice sample from these 10 people taken based on the level of ability in learning in the class to represent the population.

b. Large Group Trial

At this stage, the product has been tested on 35 third-grade students of Elementary School Pamulang Barat because they are the samples in this study. The selection of these 35 students used a random sampling technique using student attendance numbers.

5. Evaluation phase

At this stage, the researchers conducted an evaluation to measure the success of the goal of developing the snake and ladder game for dental and oral health promotion media products for school-age children. This evaluation is to determine the feasibility of the product and student responses.

Expert Validation Assessment and Student Response Assessment

1. Material Expert Validation Results

Table 1. Material expert validation results data

| No | Aspect | Score | | |
|----|--|-------------------|-------------------|---------|
| | | Material Expert 1 | Material Expert 2 | Average |
| 1 | Conformity of the material with indicators of dental and oral health | 4 | 5 | 4,5 |
| 2 | Actuality of the material presented | 4 | 5 | 4,5 |
| 3 | Expected student interactivity with media | 3 | 4 | 3,5 |
| 4 | Difficulty level of statement choice | 2 | 4 | 3 |
| 5 | Ease of learning to understand | 4 | 5 | 4,5 |
| 6 | The languages used are simple and easy to understand. | 4 | 5 | 4,5 |
| 7 | Clarity of statement | 3 | 5 | 4 |

| | | | | |
|----|--|------------|------------|------------|
| | description | | | |
| 8 | The truth of statements according to theories and concepts | 4 | 5 | 4,5 |
| 9 | The correct use of the term used | 4 | 5 | 4,5 |
| 10 | Accuracy of correct answer choices | 4 | 5 | 4,5 |
| | Total Score | 36 | 48 | 42 |
| | Average | 3,6 | 4,8 | 4,2 |

Table 2. Recapitulation of learning aspect assessment

| No | Assessment Aspect | Score | | | |
|----|-------------------|--------------------|-----------|-------------------|-----------|
| | | Material Expert 1 | % | Material Expert 2 | % |
| 1 | Learning Aspects | 36 | 72 | 48 | 96 |
| | Average | | 42 | | 84 |
| | Category | Very decent | | | |

Based on table 2 regarding percentage scores, the results of expert validation of materials on learning aspects are in the percentage range of 80-100% so that it gets the category "**Very Decent**".

Thus, the dental and oral health snake ladder media deserve to use as a medium for promoting dental and oral health in terms of learning aspects.

2. Media Expert Validation Results

Table 3. Media expert validation results data

| No | Aspects | Score | | |
|----|--|----------------|----------------|---------|
| | | Media Expert 1 | Media Expert 2 | Average |
| 1 | Effectiveness in use | 4 | 4 | 4 |
| 2 | Easy to manage/maintain | 3 | 4 | 3,5 |
| 3 | Easy to use | 4 | 5 | 4,5 |
| 4 | Accuracy of choosing media | 5 | 4 | 4,5 |
| 5 | Clarity of media usage instructions | 3 | 4 | 3,5 |
| 6 | Reusable | 4 | 5 | 4,5 |
| 7 | Communicative (easy to understand, good, true, and effective language) | 3 | 4 | 3,5 |
| 8 | Creative (flexible and interesting) | 4 | 4 | 4 |
| 9 | Innovative (intelligent and unique) | 4 | 5 | 4,5 |
| 10 | Simple | 3 | 4 | 3,5 |

| | | | | |
|--------------------|---|------------|-------------|-------------|
| 11 | Selection of the type and size of letters used | 2 | 3 | 2,5 |
| 12 | Distance settings (letters, rows, characters) | 2 | 3 | 2,5 |
| 13 | Text legibility | 3 | 3 | 3 |
| 14 | Image display is presented | 4 | 3 | 3,5 |
| 15 | Suitability of images that support the material | 3 | 4 | 3,5 |
| 16 | Layout settings | 4 | 3 | 3,5 |
| 17 | Color composition | 4 | 3 | 3,5 |
| 18 | Compatibility of color selection | 4 | 3 | 3,5 |
| 19 | Neatness of design | 3 | 3 | 3 |
| 20 | Design appeal | 4 | 4 | 4 |
| Total Score | | 70 | 75 | 72,5 |
| Average | | 3,5 | 3,75 | 3,63 |

Table 4. Recapitulation of media display aspect assessment

| No | Assessment Aspects | Score | | | |
|-----------------|-----------------------|----------------|-----------|----------------|-----------|
| | | Media Expert 1 | % | Media Expert 2 | % |
| 1 | Media Display Aspects | 70 | 70 | 75 | 75 |
| Average | | | 73 | | 73 |
| Category | | Decent | | | |

Based on table 4 regarding percentage scores, media expert validation results on media display aspects are in the percentage range of 66-79% so that it gets the "**Decent**" category.

Thus, the snake media of dental and oral health ladder is worth using as a media of promotion of dental and oral health in terms of media display.3. Student Response Assessment

a. Small Group Trials

Table 5. Recapitulation of student responses per aspect of small group trials

| No | Statement | Average | % | Category |
|----------------|---|------------|-----------|-----------|
| 1 | Interesting game media board display | 4,6 | 83 | Very good |
| 2 | This game media is easy to use. | 4,8 | 87 | Very good |
| 3 | The game instructions are easy to understand | 4,8 | 87 | Very good |
| 4 | Media contains interesting material | 4,8 | 87 | Very good |
| 5 | Material is easy to learn | 4,6 | 83 | Very good |
| 6 | Color selection on the game board is good and interesting | 4,6 | 83 | Very good |
| 7 | Exact layout and arrangement of letters | 4,7 | 85 | Very good |
| 8 | Interesting design neatness | 4,7 | 85 | Very good |
| 9 | Attractive media shapes and colors | 4,8 | 87 | Very good |
| 10 | The language used is easy to understand | 5 | 90 | Very good |
| 11 | Letters used are simple and easy to read | 4,7 | 85 | Very good |
| Average | | 4,7 | 86 | |

Total**4,7****85****Table 6.** Recapitulation of small group trial student responses

| No | Student Initial | Total Score | Average | % |
|--------------------|-----------------|-------------|-------------|-----------|
| 1 | ANH | 41 | 4,4 | 74 |
| 2 | NMA | 47 | 4,2 | 85 |
| 3 | HIS | 48 | 4,7 | 87 |
| 4 | KTJ | 55 | 5 | 100 |
| 5 | YM | 55 | 5 | 100 |
| 6 | SL | 52 | 4,7 | 94 |
| 7 | MI | 55 | 5 | 100 |
| 8 | AS | 52 | 4,7 | 94 |
| 9 | TDR | 53 | 4,8 | 96 |
| 10 | MRF | 55 | 5 | 100 |
| Total | | 513 | 47,5 | |
| Average | | 51,3 | 4,75 | 98 |
| Total Score | | 51,3 | | 93 |

Based on table 6, it can be seen that the average score of 10 students' responses in small groups is 51.3 with a percentage of

93% rating. It can be concluded that the game media for dental and oral health based on the assessment of the responses of 10 small group students can be categorized as **"Very Good"**.

b. Large Group Trials

Table 7. Recapitulation of large group trial student responses

| No | Student Initials | Total Score | Average | % |
|----|------------------|-------------|---------|-----|
| 1 | RFN | 51 | 8,5 | 93 |
| 2 | ZCP | 55 | 9,1 | 100 |
| 3 | KA | 51 | 8,5 | 93 |
| 4 | NDA | 47 | 7,8 | 85 |
| 5 | SC | 55 | 9,1 | 100 |
| 6 | SA | 53 | 8,8 | 96 |
| 7 | RII | 55 | 9,1 | 100 |
| 8 | AFR | 51 | 8,5 | 93 |
| 9 | RD | 51 | 8,5 | 93 |
| 10 | WAP | 46 | 7,6 | 83 |
| 11 | VA | 55 | 9,1 | 100 |
| 12 | BKK | 55 | 9,1 | 100 |
| 13 | RA | 55 | 9,1 | 100 |
| 14 | OF | 53 | 8,8 | 96 |
| 15 | RM | 51 | 8,5 | 93 |
| 16 | FCS | 53 | 8,8 | 96 |

| | | | | |
|----------------|-----|-------------|--------------|-----------|
| 17 | HCP | 55 | 9,1 | 100 |
| 18 | AR | 55 | 9,1 | 100 |
| 19 | DFR | 55 | 9,1 | 100 |
| 20 | NCD | 55 | 9,1 | 100 |
| 21 | MH | 51 | 8,5 | 93 |
| 22 | AAR | 51 | 8,5 | 93 |
| 23 | FNM | 51 | 8,5 | 93 |
| 24 | RF | 49 | 8,1 | 89 |
| 25 | MF | 51 | 8,5 | 93 |
| 26 | AGT | 51 | 8,5 | 93 |
| 27 | RRP | 55 | 9,1 | 100 |
| 28 | VAU | 55 | 9,1 | 100 |
| 29 | NNH | 54 | 9 | 98 |
| 30 | HAN | 54 | 9 | 98 |
| 31 | ZH | 52 | 8,7 | 94 |
| 32 | YR | 54 | 9 | 98 |
| 33 | MNA | 54 | 9 | 98 |
| 34 | RAP | 55 | 9,1 | 100 |
| 35 | DA | 53 | 8,8 | 96 |
| Total | | 1847 | 306,7 | |
| Average | | 52,8 | 8,8 | 96 |

Based on table 7, it can be seen that the average score for the response assessment of 35 students in a large group is 52.8 with an assessment percentage of 96%. It can be concluded that the game media for dental and oral health based on the assessment of the responses of 35 large group students can be categorized as **"Very Good"**.

CONCLUSION

Based on the results of research and development of dental and oral health snake and ladder game media for school-age children at Pamulang Barat Elementary School, it can be concluded:

1. Development of health promotion media with the game of snakes and ladders for dental and oral health was carried out using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method.
2. The results of the assessment from 2 material experts obtained an average score of 42 or 84% which means that they are included in the **"Very Decent"** category judging from the learning aspect.
3. The results of the assessment of 2 media experts obtained an average score of 73 or 73% so that it can be concluded that the dental and oral health snake and ladder game media is **"Decent"**, judging from the aspect of the media display.
4. The average score of 10 students' responses in small groups is 51.3 with an assessment percentage of 98%. It can be concluded that the game media for dental and oral health based on the assessment of the responses of 10 small group students can be categorized as "Very Good". The average score for the response assessment of 35 students in the large group is 52.8 with an assessment percentage of 96%. It can be concluded that the game media for dental and oral health based on the assessment of the responses of 35 large group students can be categorized as **"Very Good"**.

REKOMENDATION

Based on the research and development that has been done, suggestions are obtained to improve the development of other products. Therefore, some suggestions for further product utilization and development are that animations about oral and dental health can be more diverse.

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APPENDIX

PERATURAN BERMAIN ULAR TANGGA KESEHATAN GIGI DAN MULUT

1. Semua pemain memulai permainan dari petak nomor 1 dan berakhir pada petak nomor 45
2. Terdapat beberapa jumlah ular dan tangga yang terletak pada petak tertentu pada papan permainan
3. Terdapat 1 buah dadu dan beberapa bidak. Jumlah bidak yang digunakan berjumlah 6 bidak dengan warna merah, kuning, biru, hijau, oranye, ungu
4. Panjang ular dan tangga bermacam-macam, ular dapat memindahkan bidak pemain mundur beberapa petak, sedangkan tangga dapat memindahkan bidak pemain maju beberapa petak
5. Terdapat 3 ular dan 3 tangga pendek, dan hanya 1 tangga dan 1 ular yang panjang
6. Pada ular yang terdapat di kotak nomor 40 jika pemain memilih pernyataan yang salah maka pemain akan turun jauh sampai di kotak nomor 14 tetapi jika pemain menjawab benar maka pemain tidak berhak turun sampai di kotak nomor 14, terdapat tangga yang berada di kotak nomor 4 yang apabila pemain memilih pernyataan yang benar maka pemain berhak naik jauh di kotak nomor 24 sebaliknya apabila pemain memilih pernyataan yang salah maka pemain tidak berhak naik sampai kotak nomor 24
7. Untuk menentukan siapa yang mendapat giliran pertama, pemain melemparkan dadu yang paling besar jumlah mata dadu yang keluar maka pemain itulah yang mendapatkan giliran terlebih dahulu
8. Jika terdapat ular dan pemain memilih pernyataan yang salah maka pemain harus turun ke petak ujung kepala ular jika pemain memilih pernyataan yang benar maka pemain tidak perlu turun ke petak yang terdapat ujung ular.
9. Apabila bidak tempat pemain berhenti ada tangga maka pemain harus menjawab pernyataan dengan benar baru pemain boleh menaiki tangga sampai petak yang terdapat ujung tangga tetapi apabila pemain menjawab pernyataan yang salah maka pemain tidak berhak memindahkan bidaknya sampai ke ujung tangga
10. Bila pemain mendapat angka 6 dari pelemparan dadu maka pemain tersebut harus melakukan pelemparan dadu kembali dan menjumlahkan dadu yang keluar pertama dan kedua baru pemain menjalankan bidaknya
11. Boleh terdapat lebih dari satu bidak pada satu petak
12. Pemenang dari permainan ini adalah pemain yang pertama kali berhasil mencapai petak 45 atau petak terakhir.

Figure 3. Rules of the snake ladder game



Figure 4. Pictured at a time of a snake ladder game