

# Yani's Dh Edu Model based on Android to Improve Behavioral Changes in Dental and Oral Health Maintenance of Elementary School Students

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## Abstract:-

**Background:** The prevalence of dental and oral problems in Indonesia is still very large. Based on the 2018 Basic Health Research (Riskesdas), 57.6% of Indonesians have dental and oral problems. According to Riskesdas 2018, children who have dental problems reached 93%. The strategy to overcome this problem is through a dental health education approach. The success of health education is influenced by attractive media so that the delivery of material is more effective. Media education that is currently developing among elementary school students is technology-based media.

**Objective:** Producing an android-based Yani'S DH EDU model with a proper design and application can improve changes in dental health maintenance behavior of elementary school students. **Methods:** Research and Development (R&D) and expert validation, model testing using a quasi-experimental design with a pre and post-test design with control group design. The number of respondents was 84 elementary school students who were divided into the intervention group (Yani's DH EDU model) and control group (dental health education booklet). The instrument in this study is a questionnaire that has been tested for validity and reliability. The significance of the hypothesis test is based on the results of the Mann-Whitney test of delta data. **Results:** The value of the expert validation results ranged from 81.11%-98.89% (Fair-Very Eligible). Based on the delta data unpaired test on knowledge data obtained values ( $p = 0.0001$ ), attitudes ( $p = 0.0001$ ), actions ( $p = 0.0001$ ), debris index score ( $p = 0.012$ ), there is a significant increase in knowledge, attitudes, actions and debris index score, which means Yani'S DH EDU model based on android is more effective in increasing knowledge, attitudes, actions and reducing the debris index score in elementary school students compared to the control group. The application of the Android-based Yani'S DH EDU model effectively increases the knowledge ( $p=0.0001$ ), attitudes ( $p=0.0001$ ) and actions ( $p=0.0001$ ) of parents. **Conclusion:** The application of the Android-based Yani'S DH EDU model by parents is more effective than the control group as an effort to change the behavior of maintaining dental and oral health of elementary school students.

**Keywords:-** Elementary School Students; Yani'S DH EDU; Android; Behavior.

## I. INTRODUCTION

Dental and oral health is one of the inseparable parts of the overall health of the body. The World Health Organization (WHO) in 2016 stated that the incidence of caries in children was still 60-90% while according to Riskesda 2017 in Indonesia there was an increase in the prevalence of active caries in the Indonesian population compared to 2010, namely 43.4% (2007) to 53.2% or 93 million people. [1]

Efforts to maintain dental and oral health should be carried out from an early age. Early childhood is the "golden age period", meaning the golden period for all aspects of human development, both physical emotional and social cognition, where the development of intelligence at this time has increased by up to 50%. [2] *Schoolage* ranges from 6-12 years old. [3]

The role of parents, especially mothers, is indispensable in maintaining the child's dental and oral hygiene, because the mother can guide, remind, provide motivation, and provide facilities to the child in maintaining oral and dental hygiene. [4] Maternal knowledge is a factor that can affect the health and risk of children's dental diseases. Families who have poor dental and oral hygiene knowledge will find it difficult to implement the habit of maintaining dental and oral hygiene at home. [5] Lack of knowledge and understanding of dental health in mothers will lead to dental and oral health maintenance behaviors in children who are less supportive. [6]

The efforts that have been made by the government in overcoming this problem are by promoting dental and oral health in the UKGS program. [7] UKGS (School Dental Health Efforts) is a dental health effort to maintain and improve the dental health of students in target schools which is supported by curative actions for students who need treatment. [8] In addition, individual efforts are also made by visiting Puskesmas, Clinics and Hospitals to conduct examinations or to obtain information about oral and dental health. [9]

The program has been implemented but there are still some obstacles to problems that still exist, including the lack and uneven distribution of medical personnel so that time and opportunities to communicate are lacking, [9][10] the provision of dental health education still uses conventional media, but this media still has shortcomings, namely easily damaged, the message conveyed is not conveyed in full because sometimes there are only pictures

without captions. [11] The success of health education is influenced by the media that attracts attention so that the delivery of the material will be more effective. The educational media that is currently developing among elementary school students is technology-based media.

Unicef and Kominfo (2015) report that at least 30 million children and adolescents in Indonesia are internet users, and digital media is currently the top choice of communication channels they use. This data can be used as a basis that the use of technological media as a tool to improve student understanding is quite effective, and the nature of the media is contained in the *Yani'S DH EDU* model as a form of education that can increase student knowledge or awareness. Knowledge, attitudes and actions are factors that influence a person's awareness in maintaining oral and dental health.

**II. METHOD**

The research method used is *Research and Development (R&D)* which is used to produce the *Yani's DH edu* model as a medium for promoting dental health and testing the effectiveness of dental and oral health maintenance behaviors of elementary school students. The research and development procedure includes 5 steps, namely: 1) information collection, 2) model design, 3) expert validation and revision, 4) model trials, and 5) model results.

The design of this study was quasi-experiment (pretest and posttest with control group design) and the selection of respondents was not carried out randomly. Respondents consisted of 84 grade 4 and 5 primary school students, The sample was divided into two groups namely 42 intervention groups and 42 control groups. students in this study were taken from SD Negeri 208 Maluku Tengah and SD Negeri 246 Maluku Tengah.

Instruments for measuring knowledge, attitudes, actions using questionnaires and index debris scores using observation sheets. The research data used an interval scale, a statistical test of interclass correlation coefficient to test the feasibility of the model, while the normality test used the *Kolmogorov Smirnov* test because the respondents were more than 50. The effectiveness test used *the Wilcoxon* and *Man-Whitney* tests because the data was not normally distributed.

**III. RESULT**

*A. Information Collection*

The collection of information was carried out through an interview method which concluded that the characteristics of children of primary school age vary greatly from behavior and environmental influences, where at this age children begin to be able to develop their productivity, namely the ability to use logic, adapt and socialize with the surrounding environment seen in group formation activities with peers, children who want to know about a thing, and a child who likes to dabble in something. Efforts to provide dental and oral health maintenance education to elementary school-aged children by providing education and brushing practices

to children through parental assistance that has previously been given training by dental health workers. The dental health learning method that is suitable to be applied among children of primary school age is the demonstration method or the 3M method (Listening, Seeing and Practicing) because with this method children will find it easier to understand information. This method can be made in the form of educational applications that are more interesting and easily accessible among children of primary school age, It is undeniable that children of primary school age are currently more interested in learning using existing technology because it will be more accessible and save time and reduce their boredom in receiving information related to health, especially their dental health , but still for the use of technology it must be under the supervision of teachers in schools and parents at home.

*B. Model Design*

*Yani's DH EDU* model is an innovation developed to adapt methods and media that are relevant to the times, in this model describes the selection of good and correct toothbrushes, good and correct brushing techniques, and how to maintain oral and dental health in detail, briefly and interestingly in the form of *android* technology So that users can interact directly with the material contained in the model.

*C. Expert Validation*

Expert Validation				
Expert	N	F (%)	Average	p-value*
Information Technology Expert	18	94.44%		0,066
Dental Health Education Expert	18	98.89%	91.48%	
Media Expert	18	81.11%		

Table 1: Expert Validation

\*Intraclass correlation coefficient

Table 1. Based on the assessment results from 3 expert validators, it is known that the distribution of IT expert frequency data is 94.44% with the very decent category, Dental Health Education experts are 98.89% with the very decent category, and media experts are 81.11% with the decent category%. The average eligibility score of 91.48% with the eligible category. The results of expert validation show that the *p-value* = 0.066 which means that the android-based *Yani's DH EDU* model is relevant and feasible as an educational medium in the promotion and prevention of dental and oral health in elementary school students.

D. Product/Model Trials

Variable	Group Intervention		Control Group		p-value
	N	(%)	N	(%)	
Elementary School Students					
Gender					
Man	20	47.62%	26	61.90%	0.144
Woman	22	52.38%	16	38.10%	
Age					
10 years	21	50.00%	21	50.00%	1.000
11 years	21	50.00%	21	50.00%	
Class					
IV	21	50.00%	21	50.00%	1.000
V	21	50.00%	21	50.00%	
Learning Achievements					
<88	30	71.43%	37	88.10%	0.020
>88	8	19.05%	2	4.76%	
=88	4	9.52%	3	7.14%	
Parents					
Education					
Primary school	9	21.43%	7	16.67%	0.763
Junior High School	7	16.67%	11	26.19%	
Senior High School	23	54.76%	20	47.62%	
University	3	7.14%	4	9.52%	
Work					
Civil Servant					0.348
Entrepreneur	3	7.14%	1	2.38%	
Farmer	26	61.90%	19	45.24%	
Housewife	13	30.95%	22	52.38%	

Table 2: Frequency Distribution of Intervention and Control Respondent Characteristics

\*Anova

Table 2. Results of respondent characteristic test on Table 2. It is known that the gender of the respondents who were sampled in this study in the intervention group were men as many as 20 people (46.62%) and women as many as 22 people (52.38 %) while the type control group male gender was 26 people (61.90%) and female as many as 16 people (38.10%). The frequency of respondents by age in both the intervention and control groups was the same at 50.0% for 10-year-olds and 11-year-olds, respectively. The frequency of respondents by class in both the intervention and control groups was the same, namely 50.0% for each of classes IV and V. The frequency of respondents based on learning achievement was with a score of < 88, which was 71.43% in the intervention group and 88.10% in the control group.

The frequency of respondents based on parental education in the intervention and control group had the same proportion of most high school education, in the intervention group 54.76% and in the control group 47.62%. The frequency of respondents based on parental occupation in the intervention and control group had a different proportion in the intervention group most of the work as a

farmer 61.90%, and in the control group most of the work as Housewives 52.38%.

The homogeneity test results showed that the variables of gender, age, class, education and occupation had the same data variation in the intervention and control group with a p-value of > 0.05 while for the learning achievement variable did not have the same data variation in the intervention group and control with a p-value of < 0.05, so it can be concluded that the variants of gender, age, class, education and occupation of the two sample groups are homogeneous while for the variants of learning prestration variables in two groups inhomogeneous.

Group	Mean±SD	Mean±SD	p-value
	Pretest	Posttest	
Test Paired Data*			
Intervention	4.55±1.041	9.67±1.162	0.0001*
Control	3.71±0.97	7.95±0.962	0.0001*
Test Unpaired Data**			
Intervention	4.55±1.041	9.67±1.162	
Control	3.71±0.97	7.95±0.962	
p-value	0.0001**	0.0001***	
Test Data Unpaired Change Value (Δ)**			
Mean±SD			
Pretest-Posttest			
Intervention	5.12±0.55		0.292****
Control	4.24±1.805		

Table 3: Tests of the Effectiveness of Primary School Students' Knowledge in Intervention Groups and Control Groups

\*Test pairs

:Wilcoxon

\*\*Unpaired test pre test data

:Man-

Whitney Pre Test

\*\*\*Unpaired test post test data

:Man

Whitney Post-Test

\*\*\*\*Unpaired test delta data

:Man-

Whitney Data Δ

Table 3. The results of the effectiveness test of paired data of knowledge of elementary school students showed that the p-value of the intervention group was 0.000 1 (p<0.05) meaning that the android-based Yani's DH EDU model was effective in improving health care knowledge. teeth and mouth of elementary school students. The p-value of control group knowledge is 0.0001 (p<0.05) meaning that the booklet used in the control group effectively improves the knowledge of elementary school students.

The results of the data effectiveness test were not paired variables of knowledge students pretest data between the intervention group and the control group differed meaningfully seen the p-value was 0.000 1 (p<0.05) while for the post-test data the intervention and control groups differed meaningfully visible p-value is 0.0001 (p<0.05) meaning that Yani's DH EDU-based model is more effective at improving primary school students' dental and oral health maintenance knowledge compared to booklets used in control groups. This is evidenced by the increase in the average value after being treated in the intervention

group better compared the control group, namely the intervention group to 9.67 while the control group to 7.95.

The results of the unpaired data test of the delta value ( $\Delta$ ) pre-post did not differ meaning that the *p-value* was 0.292 ( $p > 0.05$ ) meaning that there was no difference in the improvement in students' dental and oral health maintenance knowledge in the intervention group and the control group. The delta value ( $\Delta$ ) in the intervention group was 5.12 while the control group was 4.24.

Group	Mean±SD Pretest	Mean±SD Posttest	<i>p-value</i>
Test Paired Data*			
Intervention	36.67±6.927	51.12±4.759	0.0001*
Control	34.98±6.609	44.62±2.785	0.0001*
Test Unpaired Data**			
Intervention	36.67±6.927	51.12±4.759	
Control	34.98±6.609	44.62±2.785	
<i>p-value</i>	0.018**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
Pretest-Posttest			
Intervention	2:45 p.m±7,896		0.0001***
Control	9.64±5.258		*

Table 4: Tests of the Effectiveness of Elementary School Students' Attitudes in Intervention Groups and Control Groups

\*Test :Wilcoxon  
 \*\*Unpaired test pre test data :Man-Whitney Pre Test  
 \*\*\*Unpaired test post test data :Man-Whitney Post Test  
 \*\*\*\*Unpaired test delta data :Man-Whitney Data  $\Delta$

Table 4. The results of the effectiveness test of paired data on attitudes of primary school students showed that the *p-value* of the intervention group was 0.0001 ( $p < 0.05$ ) meaning that the *android-based Yani's DH EDU* model effectively improved health care attitudes teeth and mouth of elementary school students. The *p-value* of the attitude of the control group is 0.0001 ( $p < 0.05$ ) meaning that the booklet used in the control group effectively improves the attitudes of elementary school students.

The results of the data effectiveness test did not pair the student attitude variables pretest data between the intervention group and the control group differed meaningfully seen the *p-value* was 0.018 ( $p < 0.05$ ) while for the post-test data the intervention and control group was significantly seen the *p-value* value was 0.0001 ( $p < 0.05$ ) means that *Yani's DH EDU-based* model is more effective at improving the dental and oral health maintenance attitudes of primary school students compared to booklets used in the control group. This is evidenced by the increase in the average value after being treated in the intervention group better compared the control group, namely the intervention group to 51.12 while the control group to 44.62.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.0001 ( $p < 0.05$ ) meaning that there was a difference in the improvement in students' dental and oral health maintenance attitudes in the intervention group and control group. The delta value ( $\Delta$ ) in the intervention group was 14.45 while the control group was 9.64.

Group	Mean±SD Pretest	Mean±SD Posttest	<i>p-value</i>
Test Paired Data*			
Intervention	4.55±1.041	9.81±1.234	0.0001*
Control	3.33±0.754	7.45±0.739	0.0001*
Test Unpaired Data**			
Intervention	4.55±1.041	9.81±1.234	
Control	3.33±0.754	7.45±0.739	
<i>p-value</i>	0.0001**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
Pretest-Posttest			
Intervention	5.26±0.587		0.0001****
Control	4.12±1.194		

Table 5: Test the Effectiveness of Elementary School Students' Actions in Intervention Groups and Control Groups

\*Test :Wilcoxon  
 \*\*Unpaired test pre test data :Man-Whitney Pre Test  
 \*\*\*Unpaired test post test data :Man-Whitney Post Test  
 \*\*\*\*Unpaired test delta data :Man-Whitney Data  $\Delta$

Table 5. The results of the effectiveness test of paired data of actions of primary school students showed the *p-value* of the intervention group was 0.0001 ( $p < 0.05$ ) meaning that the *android-based Yani's DH EDU* model effectively improved maintenance measures dental and oral health of elementary school students. The *p-value* of the control group action is 0.0001 ( $p < 0.05$ ) meaning that the booklet used in the control group effectively improves the actions of primary school students.

The results of the data effectiveness test did not pair the student action variables pretest data between the intervention group and the control group differed meaning the visible *p-value* was 0.0001 ( $p < 0.05$ ) while for the post-test data the intervention and control group differed meaningfully visible *p-value* is 0.0001 ( $p < 0.05$ ) meaning that *Yani's DH EDU-based* model is more effective at improving the dental and oral health maintenance measures of primary school students compared to booklets used in control groups. This is evidenced by the increase in the average value after being treated in the intervention group better compared the control group, namely the intervention group to 9.81 while the control group to 7.45.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.000 1 ( $p<0.05$ ) meaning that there were differences in the improvement of students' dental and oral health maintenance measures in the intervention group and the control group. The delta value ( $\Delta$ ) in the intervention group was 5.26 while the control group was 4.12.

Group	Mean±SD	Mean±SD	<i>p-value</i>
	Pretest	Posttest	
Test Paired Data*			
Intervention	2.48±0.505	1.29±0.708	0.0001*
Control	2.81±0.397	1.88±0.328	0.0001*
Test Unpaired Data**			
Intervention	2.48±0.505	1.29±0.708	
Control	2.81±0.397	1.88±0.328	
<i>p-value</i>	0.002**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
Pretest-Posttest			
Intervention	1.19±0.505		0.012****
Control	0.93±0.407		

Table 6: Tests of Effectiveness of debris index score of Elementary School Students In Intervention Groups and Control Groups

\*Test pairs  
:Wilcoxon  
\*\*Unpaired test pre test data :Man-Whitney Pre Test  
\*\*\*Unpaired test post test data :Man-Whitney Post Test  
\*\*\*\*Unpaired test delta data :Man-Whitney Data  $\Delta$

The results of paired data effectiveness test score debris index elementary school students showed the value of the intervention group *p-value* is 0.0001 ( $p<0.05$ ) means Yanis'S DH EDU model based on android effectively improve the score debris dental and oral health maintenance index elementary school students. The *p-value* of the control group debris index score is 0.0001 ( $p<0.05$ ) meaning that the booklet used in the control group effectively increases the debris index score of elementary school students.

The results of the effectiveness test of unpaired data variables debris index score student pretest data between the intervention group and the control group differed meaning that the *p-value* was 0.002 ( $p<0.05$ ) while for the post-test data the intervention and control groups differed meaningfully visible *p-value* is 0.0001 ( $p<0.05$ ) meaning that *Yani's DH EDU-based* model is more effective at lowering the dental and oral health maintenance index of primary school students compared to the booklet used on control group. This is evidenced by the decrease in the average value after being treated in the intervention group better compared the control group, namely the intervention group to 1.29 while the control group to 1.88.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.012 ( $p<0.05$ ) meaning that there was a difference in the decrease in the debris index score of dental and oral health care of students in the intervention group and the control group. The delta value ( $\Delta$ ) in the intervention group was 1.19 while the control group was 0.93.

Group	Mean±SD	Mean±SD	<i>p-value</i>
	Pretest	Posttest	
Test Paired Data*			
Intervention	4.64±1.078	9.76±1.185	0.0001*
Control	3.79±0.898	7.4±0.497	0.0001*
Test Unpaired Data**			
Intervention	4.64±1.078	9.76±1.185	
Control	3.79±0.898	7.4±0.497	
<i>p-value</i>	0.0001**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
Pretest-Posttest			
Intervention	5.12±0.633		0.0001****
Control	3.62±1.058		

Table 7: Testing the Effectiveness of Parental Knowledge in Intervention Groups and Control Groups

\*Test pairs :Wilcoxon  
\*\*Unpaired test pre test data :Man-Whitney Pre Test  
\*\*\*Unpaired test post test data :Man-Whitney Post Test  
\*\*\*\*Unpaired test delta data :Man-Whitney Data  $\Delta$

Table 7. The results of the effectiveness test of paired data on parental knowledge showed that the *p-value* of the intervention group was 0.000 1 ( $p<0.05$ ) meaning that the *android-based Yani's DH EDU model* effectively increased knowledge of health maintenance and parents' mouths. The *p-value* of control group knowledge is 0.000 1 ( $p<0.05$ ) meaning that the booklet used in the control group effectively improves parental knowledge.

The results of the data effectiveness test did not pair the parent knowledge variables of pretest data between the intervention group and the control group differingly meaning the *p-value* was 0.000 1 ( $p<0.05$ ) while for the post-test data the intervention and control group differed meaningfully visible *p-value* is 0.0001 ( $p<0.05$ ) meaning that *Yani's DH EDU-based* model is more effective at improving parental dental and oral health maintenance knowledge compared to booklets used in the control group. This is evidenced by the increase in the average value after being treated in the intervention group better compared the control group, namely the intervention group to 9.76 while the control group to 7.40.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.00 01 ( $p<0.05$ ) meaning that there was a difference in the improvement of parental dental and oral health care knowledge in the intervention group and the control group.

The delta value ( $\Delta$ ) in the intervention group was 5.12 while the control group was 3.62.

Group	Mean±SD	Mean±SD	<i>p-value</i>
	<i>Pretest</i>	<i>Posttest</i>	
Test Paired Data*			
Intervention	36.67±6.927	53.83±3.131	0.0001*
Control	36.31±6.705	36.31±6.705	1.000*
Test Unpaired Data**			
Intervention	36.67±6.927	53.83±3.131	
Control	36.31±6.705	48.62±4.924	
<i>p-value</i>	0.646**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
<i>Pretest-Posttest</i>			
Intervention	5:17±7:516 p.m.		0.0001*
Control	0±0		***

Table 8. Testing the Effectiveness of Parental Attitudes in Intervention Groups and Control Groups

\**Test pairs* :Wilcoxon  
 \*\**Unpaired test pre test data* :Man-Whitney Pre Test  
 \*\*\**Unpaired test post test data* :Man-Whitney Post Test  
 \*\*\*\**Unpaired test delta data* :Man-Whitney Data  $\Delta$

Table 8. The results of the effectiveness test of paired parental attitude data showed that the *p-value* of the intervention group was 0.0001 ( $p < 0.05$ ) meaning that the android-based Yani's DH EDU model effectively improved dental health maintenance attitudes and parents' mouths. The *p-value* of the attitude of the control group is 1,000 ( $p > 0.05$ ) meaning that the booklet used in the control group is not effective in improving parental attitudes .

The results of the data effectiveness test did not pair the parent attitude variables of the pretest data between the intervention group and the control group did not differ meaning that the *p-value* was 0.646 ( $p > 0.05$ ) while for the post-test data of the intervention group and the different controls meaningful visible *p-value value* was 0.0001 ( $p < 0.05$ ) means that Yani's DH EDU-based model is more effective at improving parental dental and oral health maintenance attitudes compared to booklets used in the control group. This is evidenced by the increase in the average value after being treated in the intervention group better compared to the control group, namely the intervention group to 53.83 while the control group to 48.62.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.000 1 ( $p < 0.05$ ) meaning that there was a difference in the improvement in parental dental and oral health care attitudes in the intervention group and control group. The delta value ( $\Delta$ ) in the intervention group was 17.17 while the control group was 0.00.

Group	Mean±SD	Mean±SD	<i>p-value</i>
	<i>Pretest</i>	<i>Posttest</i>	
Test Paired Data*			
Intervention	4.6±1.106	9.62±1.188	0.0001*
Control	4.6±1.106	7.52±0.505	0.0001*
Test Unpaired Data**			
Intervention	4.6±1.106	9.62±1.188	
Control	4.6±1.106	7.52±0.505	
<i>p-value</i>	1.000**	0.0001***	
Test Data Unpaired Change Value ( $\Delta$ )**			
Mean±SD			
<i>Pretest-Posttest</i>			
Intervention	5.02±0.78		0.000 1****
Control	2.93±1.369		

Table 9: Testing the Effectiveness of Parental Actions in Intervention Groups and Control Groups

\**Test pairs* :Wilcoxon  
 \*\**Unpaired test pre test data* :Man-Whitney Pre Test  
 \*\*\**Unpaired test post test data* :Man-Whitney Post Test  
 \*\*\*\**Unpaired test delta data* :Man-Whitney Data  $\Delta$

Table 9. The results of the effectiveness test of paired parental action data showed that the *p-value* of the intervention group was 0.000 1 ( $p < 0.05$ ) meaning that the android-based Yani's DH EDU model was effective in improving dental health maintenance measures and parents' mouths. The *p-value* of the control group's action is 0.0001 ( $p < 0.05$ ) meaning that the booklet used in the control group effectively improves parental action.

The results of the data effectiveness test did not pair the parent action variables of the pretest data between the intervention group and the control group did not differ meaning that the *p-value* was 1,000 ( $p > 0.05$ ) while for the post-test data the intervention and control groups differed meaningfully visible *p-value* is 0.0001 ( $p < 0.05$ ) meaning that Yani's DH EDU-based model is more effective at improving parental dental and oral health maintenance measures compared to booklets used in the control group. This is evidenced by the increase in the average value after being treated in the intervention group better compared the control group, namely the intervention group to 9.62 while the control group to 7.52.

The results of the unpaired data test of different pre-post delta values ( $\Delta$ ) meant that the *p-value* was 0.000 ( $p < 0.05$ ) meaning that there was no difference in the improvement of parental dental and oral health maintenance measures in the intervention group and the control group. The delta value ( $\Delta$ ) in the intervention group was 5.02 while the control group was 2.93.

Test Unpaired Data**			
Group	Mean ± SD	Mean ± SD	
	Pre-Test	Post-Test	
Intervention	45.76 ± 7.16	70.59 ± 5,305	
Control	42.02 ± 6.66	60.02 ± 3,064	
<i>p-Value</i>	0.0001	0.0001	
Test Unpaired Data Change Value (Δ)**			
	Mean ± SD		<i>p-Value</i>
	Pre - Post Test		
Intervention	24.83 ± 8.04		0.0001
Control	18 ± 5,437		

Table 10: Test the Effectiveness of Student Behavior in the Intervention and Control Group

\*\*Unpaired test pre test data :Man-Whitney Pre Test  
 \*\*\*Unpaired test post test data :Man-Whitney Post-Test  
 \*\*\*\*Unpaired test delta data :Man-Whitney Data Δ

Table 10. The results of the effectiveness test of unpaired data variable behavior of pre-test data between the intervention group and the control group differed meaningfully seen the *p-value* was 0.000 ( $p < 0.05$ ) while for the post-test data of the intervention and control group different meaningful seen *p-value* was 0.000 ( $p < 0.05$ ) meaning that the model of Yani's DH EDU Android-based more effectively improved students' dental and oral health maintenance behaviors compared to booklets used on control groups. This was evidenced by an increase in the average value after being treated in the intervention group better than the control group, namely the intervention group to 70.59 while the control group to 60.02.

The results of the unpaired data test of different delta values (Δ) pre-post tests meant that the *p-value* was 0.000 ( $p < 0.05$ ) meaning that there were differences in the improvement of students' dental and oral health maintenance behaviors in the intervention group and the control group. The delta value (Δ) in the intervention group was 24.83 while the control group was 18.0.

Variable	B	<i>p-value</i>	R	R Squ are	Adju sted R Squ are	C	<i>p-value</i> An ova
Parental Knowled ge	0.030	0.798	0.57	0.325	0.299	3.236	0.000
Parental Attitudes	0.023	0.089	0			6	
Parental Actions	0.283	0.002					

Table 11: Intermediate Variables towards Dental and Oral Health Care Behavior of Elementary School Students with Yani'S DH EDU Model Based on Android

\*Linear Regression Analysis

Based on Table 11, it can be seen that the constant value is 3.236 with a knowledge coefficient of 0.030 meaning that a 1% increase in the parental knowledge value will increase the brushing of the teeth of an elementary school child by 0.030. An attitude coefficient value of 0.023 means that an increase in the parent's attitude value of 1% will increase the brushing action of elementary school children by 0.023 and an action coefficient value of 0.283 means that an increase in the value of parental actions of 1% will increase the act of brushing the teeth of elementary school children by 0.283.

The results of the analysis showed  $R = 0.570$  meaning that there is a fairly strong correlation and has a very meaningful effect between parents' knowledge, attitudes and actions with the formation of brushing behavior in elementary school children while the result of  $R^2$  (R Square) is 0.325 or (32.5%), meaning that parents' knowledge, attitudes, actions have an influence of 32.5% on the formation of brushing behavior of elementary school children . The results of the analysis also showed a value of  $p = 0.000$  meaning the influence of knowledge, attitudes and actions of parents on the formation of brushing behavior of elementary school children. The test results were respectively parental actions ( $p = 0.798$ ), parental knowledge ( $p = 0.089$ ) and attitudes (0.002).

E. Product Result

The resulting product is one of the innovations of android-based promotional and preventive efforts to maintain dental and oral health and change dental and oral health maintenance behaviors in elementary school children. Model Yani's DH EDU is a video and quiz content that contains the selection of a good and correct toothbrush, how to brush your teeth properly and correctly and how to maintain healthy teeth and mouth. This android-based Yani's DH EDU model emphasizes independence to improve behavioral changes in dental and oral health maintenance of elementary school students. The implementation of the Yani's DH EDU model emphasizes the role of children who are assisted and supervised by parents in brushing their teeth starting with filling out registration, logging in, doing checklists every morning and evening after brushing their teeth according to the notifications that come in the whatshap of each respondent and viewing videos and answering quizzes from each video.



#### IV. DISCUSSION

The characteristics of elementary school-aged children vary greatly from behavior and environmental influences, where at this age children begin to be able to develop their productivity, namely the ability to use logic, adapt and socialize with the surrounding environment seen in group formation activities with peers, children who want to know about something, and children who like to dabble in something.

Forming dental and oral health maintenance behaviors in elementary school-age students requires an educational method with interesting and not boring media that directly involves elementary school students so that it can stimulate elementary school students to make changes in good and correct dental health behaviors, in accordance with the opinion of Putu (2012) said the success of health socialization as an effort to improve health depends on the media used when delivering socialization to create community participation. Interesting media in health education will make it easier for health messages to be conveyed so that the target can easily receive messages clearly and precisely. [12]

The delivery of health information for school-age children requires an interesting method of delivery so that children can understand well the health information that can later affect their lifestyle. An educational method that is suitable for use as a medium for dental health education is *the android-based Yani's DH EDU* model. [13]

Based on the characteristics of elementary school students who have not been able to maintain their own dental and oral health, so students still need the help of others, one of which is parents, the role of parents as figures and as role models who will provide a good example for children in doing dental care. [14]

Parental participation is needed in guiding, reminding and providing facilities so that children can maintain dental and oral hygiene, in this case parents play an important role in paying attention to children's discipline towards responsibility for themselves in maintaining their dental health, besides that they play an important role in the learning process of a children such as learning how to choose a good and correct toothbrush, how to brush their teeth properly and correctly, and how to maintain healthy teeth and mouth so that *Yani's DH EDU-based* model that involves parents is effective in maintaining children's dental and oral health behaviors. [15] [16]

Parents are given training aimed at improving knowledge, attitudes and actions of maintaining dental health towards the implementation of the model, so that they are expected to be able to *transfer knowledge of skills* to children. According to Nurhidayat et al (2012), the importance of the role of parents in maintaining children's dental and oral health is so that child respondents are able and can maintain their dental and oral health properly. Another factor that can influence the success of dental health in a child is the use of a toothbrush. During this time the child rarely pays attention to the toothbrush used and

how to brush his teeth correctly. The role of parents is indispensable in order to provide a toothbrush that is inline with the child's age and demonstrate how to brush teeth correctly. [17]

The results of the effectiveness test of variable data paired with knowledge, attitudes, and actions of maintaining parental dental health in the intervention and control group showed that the *p-value* was  $<0.05$  meaning that *Yani's DH EDU* model based on android and booklets were equally effective in improving parents' knowledge, attitudes, and oral health maintenance measures.

The increase in knowledge, attitudes and actions is due to the fact that during training parents are given an understanding of the material for maintaining dental and oral health. Health education is essentially an activity or effort to convey a health message to the community, group or individual. By being given training, respondents get learning that results in a change from what was originally unknown to known, which previously did not understand to be understood. This research is also in line with the results of Amin's research (2014) that dental health education has a positive effect on changes in the values, attitudes and actions of parents in maintaining their children's dental and oral health. [18] [19]

Parents who have been given training are a pilot model for elementary school students because then parents will implement or apply *the android-based Yani's DH EDU* model as an effort to form children's dental health maintenance behaviors. According to Subekti (2017) parental assistance in brushing greatly affects changes in brushing behavior and the level of dental hygiene of children. [20]

The results of the test of the effectiveness of paired variable data showed that the *p-value* in the intervention group and control group increased knowledge with a value ( $p<0.05$ ) meaning that the *android-based DH EDU* model and booklets in the control group effectively increased knowledge of dental and oral health maintenance of elementary school students. The success of *Yani's DH EDU-based* model can also be seen from the results of the effectiveness test of unpaired data showing the value of the *mann-whitney* test of the pre-test knowledge of the intervention group and the control group ( $p>0.05$ ) while in the post test the value ( $p<0.05$ ) means that the *android-based Yani's DH EDU* model is more effective at increasing knowledge maintenance of dental and oral health of primary school students compared to booklets used in the control group.

The increase in knowledge in the intervention group is due to the *Yani's DH EDU* model based on android educational videos and quizzes packed with easy-to-understand language, videos are not only in the form of writing but are accompanied by color images so that elementary school students can more easily understand information in the form of selection of a good and correct toothbrush, how to brush your teeth properly and correctly and how to maintain healthy teeth and mouth, this is in line



with research by Eka et al (2019) that dental and oral health counseling using *flipcharts* is more effective than counseling using *phantoms* because of the presence of images that make children remember more in the long term. According to Notoatmodjo (2010) in Anang (2020) states that knowledge is the result of knowing a person about objects through the eyes, nose of the ears and other senses he has so that knowledge is obtained that is influenced by the intensity of attention and perception of objects. [21]

A person's knowledge is influenced by various mass media, both print and electronic media, so that various information is easily accepted by the public. [22] The media used to interactively convey health messages to children in the form of color images, simple language, short stories and videos is very useful to help children obtain information easily and entertainingly. [23] The medium used will affect a person's level of knowledge. Knowledge will be processed into knowing, understanding, application, analyzing, synthesis and evaluation. [22]

The results of the effectiveness test of paired variable data showed the *value of p-value* attitudes in the intervention group and control group ( $p < 0.05$ ) meaning that the *android-based Yani's DH EDU* model and booklet in the control group effectively improved the attitude of maintaining dental and oral health of elementary school students.

The success of the android-based Yani's DH EDU model can also be seen from the results of the effectiveness test of unpaired attitude data showing the value of the *mann-whitney test at the value of change* ( $\Delta$ ) pre-post test intervention group and control group ( $p < 0.05$ ) meaning that *Yani's DH EDU-based* model is more effective at improving maintenance attitude Dental health in elementary school students was compared with booklets used in the control group. The increase in attitude occurred because in the android-based Yani's DH EDU model there were quizzes and explanatory videos about choosing a good and correct toothbrush, how to brush your teeth properly and correctly and how to maintain healthy teeth and mouth so that the information in *Yani's DH EDU* model is based on android Not only in the form of writing that will make students easily bored. This research is in line with the research of Suryaningsih, E, et al (2020) stated that dental health counseling using video improves children's attitudes in dental care. According to Herijulianti et al (2002) in Anang (2020) health education is a process of teaching and learning to individuals or community groups about health values that can change a person's attitude in responding to something so that they are able to overcome health problems, especially dental health problems towards a positive attitude. [21] [24]

Changes in one's attitude are inseparable from the process of knowledge that increases from not knowing to knowing and then understanding and making attitude patterns change. A person can be kind after knowing that if they do not change healthy behaviors, they can risk becoming ill. According to Pratama (2013) in Junaidin (2020) attitude is a transition of action but does not include an action or activity. [25]

The results of the effectiveness test of paired variable data showed the *p-value* of the action in the intervention group and the control group ( $p < 0.05$ ) meaning that the *android-based Yani's DH EDU* model and booklet in the control group effectively improved dental and oral health maintenance measures of elementary school students. According to Budioro (2013) in Junaidin (2020) said behavior is a response to individual actions that are observed both in passive and active form, passive forms that occur in humans and cannot be seen directly by humans in the form of knowledge, attitudes and perceptions. The better knowledge will affect the attitude of getting better. A good attitude will be implemented into an action that is an act of dental and oral health maintenance skills. [25]

The results of the effectiveness test of unpaired action data showed the value of the *mann-whitney* test at the value of change ( $\Delta$ ) pre-post test of the intervention group and the control group ( $p < 0.05$ ) meaning that *the android-based Yani's DH EDU* model was more effective at improving dental health maintenance measures in primary school students compared to the booklets used on the control group. The increase in measures in the maintenance of dental and oral health in elementary school students is due to the android-based *Yani's DH EDU* model equipped with quizzes and videos of good and correct toothbrush selection, how to brush teeth properly and correctly and how to maintain dental and oral health as well as consultation features that students can use to consult directly with admins, so that the information in the educational model can be used by students repeatedly, according to research conducted by Hasrini et al (2020) that the video method improves student actions towards *personal hygiene* and dental health status.

The success of *Yani's DH EDU-based* model also saw a decrease in the debris status of the student *index*. The results of the effectiveness test in the intervention group showed that the *p-value* of the intervention group was 0.000 1 ( $p < 0.05$ ) meaning that the *android-based Yani's DH EDU* model was effective in reducing the *debris status of the primary school student index*. Primary school students' *index debris* scores have decreased because the sample has been taught to understand the practice of how to brush teeth properly and correctly. In accordance with Bridges' research (2014) the provision of material is closely related to oral hygiene status. [26]

Dental health problems that occur among school-age children affect children's learning activities and also their health, so promotional and preventive efforts are needed in the form of education. Providing education to children requires media that is in accordance with the stage of development of school-age children. [27] As time goes by and increasingly sophisticated equipment requires an android-based electronic media that can help humans overcome health problems. Interesting educational media can arouse children's enthusiasm and motivation for learning. Interesting media is media that contains color images and videos that are easy to understand so that the education provided to children is not monotonous. [28] The

presentation of images and information influences memory over a long period of time. [27]

The results of the intermediate variable test and bound variables using linear regression tests show that there is a strong correlation ( $R=0.570$ ) and had a very meaningful effect between parental knowledge and parental actions with the formation of dental health maintenance behaviors of primary school students ( $p=0.000$ ), as well as the test results of each parent's actions ( $p=0.002$ ) and parental knowledge ( $p=0.798$ ) means that the variable between the actions and knowledge of parents is the variable that most influences the formation of dental health maintenance behaviors of elementary school students.

The knowledge and actions of parents are influential because parents have been given training on *Yani's DH EDU* model based on android and are able to implement the model well. According to Subekti (2017) parental assistance in brushing greatly affects changes in brushing behavior and the level of dental hygiene of children. [20]

## V. CONCLUSION

Elementary school age varies greatly from behavior and environmental influences, where at this age children begin to be able to develop their productivity, namely the ability to use logic, adapt and socialize with the surrounding environment seen in group formation activities with peers, children who want to know about something, and children who like to dabble in something. Based on the results of this study, it can be concluded that the android-based *Yani's DH EDU* model is more effective than the media booklet. *Yani's DH EDU* model can improve parents' knowledge, attitudes and actions and can improve knowledge, attitudes, actions and decrease in primary school students' debris index scores.

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