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Android-based application development as a communication media for Pares and Teacher in addressing early childhood behaviour

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Abstract. The recent phenomenon of Bullying has unseated the world of education. It requires educators to develop products that can address that behaviour. The study aims to formulate android-based apps as a medium of communication between teachers and parents to address bullying behaviour both at school and at home. This research is development research with 4D development models (Define, Design, Develop, and Disseminate). The subjects of his study are students class 1 and class 2, parents, teachers, parents of students. This hypothesis test uses paired samples t-test by comparing pre-test and post-test scores before and after using the adroit application. The results showed that the use of android applications as a communication medium for teachers and parents had a significant impact on improving early childhood bullying behaviour in school and at home. As for the results of the test, the t value of 29,306 with sig (2 tailed) $0.000 > 0.05$. It indicates that there is a difference between the pre-test value and the post-test value because the t score found to be positive then this shows that the post-test cost is lower than the pre-test value which means a decrease in bullying behaviour in those children.

1. Introduction

Along with the development of the times and era of globalization today, various phenomena and problems are enveloping the world of education, not least early childhood education. So many cases of Bullying that this behaviour has become a very concerning phenomenon in any part of the world, including Indonesia. Cases of Bullying often happen to children, both at home and at school. Bullying is aggressive behaviour that is repeated by physically and mentally harming [1]. Bullying in schools has three integrated characteristics, namely: 1) actions that the perpetrator intentionally committed to harm the victim, 2) activities performed disproportionately resulting in distress in victim 3). Actions performed over and over again. [1] Bullying is an excellent inhibition for a child to realize themselves, Bullying does not provide a sense of security and comfort, makes the victims of Bullying feel afraid of being intimidated, inferior and worthless, challenging to concentrate in learning, does not move to socialize with his environment, is reluctant to go to school, is personally unconfident and challenging to communicate, challenging to think clearly until his academic achievement slumps [2]. Bullying behaviour often occurs in schools that lack the supervision of teachers, are loose in applying the rules, and the authorities do not have a firm attitude and view of Bullying [3].

According to King's College London research, those who as children experience bullying have a higher risk of depression and anxiety and are more likely to have a lower quality of life by the age of 50. Impacts for victims of Bullying include depression, low confidence or mindfulness, shyness and solitary, declining academic achievement, feeling isolated in the association, thinking, or even trying to commit suicide [4]. Nasution's research found that several factors cause bullying behaviour, including

the relationship of individual elements, family factors, peers, schools, the environment, and the media to bullying behaviour [5].

Ronbanks, in his article, Bullying shows some symptoms, such as anxiety, always feeling insecure, very cautious, and they offer low self-esteem. They also have intense social interactions with friends, sometimes including children isolated by their peers [6].

The results of interviews with teachers at Taman Sari 3 Yogyakarta Elementary School that bullying behaviour in the school is familiar every day there are always children who report that there is a bullying action committed by his friend one class, his friend often commits violent acts such as kicking, punching, threatening, uttering rants, making nicknames that are ridiculed, pranking by stealing friends' goods, promoting, insulting, kicking, pinching, etc. Bullying behaviour of children in school is often considered reasonable action. Many teachers and parents of students tend to think it is commonplace in early childhood. "His name is also children" these words are perhaps the most commonly heard. If we review it further, the behaviour of elementary school children will be hazardous if not addressed immediately or found a solution. If in elementary school alone students already have bullying behaviour then it can be confident that when he or she is in middle school, high school will undeniably occur more cases involving them because, in school, good or bad behaviour will be recorded from a child.

Based on observations researchers conducted at SD Taman Sari 3 Yogyakarta researchers found some problems in the field, such as children not being able to make good friendship patterns, children still like to pick friends and excommunicated other friends, so that the child who is ostracized often becomes moody, sad, and crying. During rest hours, it is often the child who makes fun of his friend until he calls, to physical treatment such as kicking, punching, even pushing his friend. After being observed, the victim was the same child and the same child abuser; this incident has been identified as bullying behaviour. Then researchers found a lack of attention from teachers in identifying bullying behaviour. Teachers have not taken bullying behaviour as a serious problem. So the teacher's efforts in dealing with this bullying problem have not been seen. This is seen when the child complains to the teacher that he is not invited to play by his friend, and the teacher relaxes and tells the child to play with another friend. Because of this, the problem of Bullying will not be solved; it can even be sustainable. Indeed, at the age of 6-8 years, the case of Bullying lacks attention because it is considered a natural thing to happen. But this should be taken seriously, given the devastating impact on victims and perpetrators of Bullying.

Based on the above phenomena and experts' opinions on the impact of student bullying behaviour, problem-solving is necessary for child bullying behaviour. The development of the adroit application as a communication medium for teachers and parents to address bullying behaviour in school and at home. With communication between parents and teachers in the school can be well established to avoid bullying behaviour in schools. This android-based app is intended to monitor children's activities in school and at home and make it easier to communicate between teachers and parents of students using a handheld telephone device. In this app, all parents of students are connected to their class teacher. So parents get reports directly from their teachers about deviant activities and behaviours (misconduct), especially bullying behaviour when the child is in school. Also, parents get other information in the form of activities in the school, records of violations, number of attendances, and others. With this intertwined communication, parents become more trusting in the teacher; parents give more attention to their children. So it is expected that by improving communication between parents and teachers make the child more accomplished and have better character. Communication between school and family is necessary to trigger parental involvement in the learning process. The combined effect of schools, homes, and communities is critical to a child's development, as communication between school, family, and community makes it possible to create a more optimal environment in which all of these parts contribute together to support a child's academic progress and social development [7]. The problem in Taman Sari Yogyakarta Elementary School is that parents do not have access to know directly about their child's problems at school, the parents have difficulty in communication with parents so that bullying behaviour always occurs both at home and at school.

Based on the industrial revolution, 4.0 requires technology to penetrate the world of education, especially in addressing the problems of early childhood—development of android-based apps as a communication medium for parents and teachers in addressing bullying behaviour.

2. Method

This research is a developmental study, which aims to develop android-based apps as a medium of communication between teachers and parents to address bullying behaviour. The development model used is a 4D model (Define, Design, Develop, Disseminate). The effectiveness of this android-based app can be known through the aspects examined in this study is the bullying behaviour of an android app as a communication tool of teachers and parents in addressing Bullying. The total number of subjects of this study is 48 students at SD Taman Sari 3 Yogyakarta with 22 female students and 26 male students. The study also involved eight teachers and 48 parents. Specific criteria that nominate them as bullying behaviour. The method used in this study is a descriptive method with a quantitative approach. The research data was collected using questionnaires, observations, and interviews. The questionnaire in the survey was used to find out if after using astrocytes, bullying behaviour in school and at home was at a low level. Interviews and observations are conducted to find out how the story of bullying behaviour or specific criteria that nominate them as bullying behaviour.

3. Results and Discussion

The result of the development has been in the form of an android-based application as a medium of communication between teachers and parents to overcome bullying behaviour. In the application work using prototype models. The details of the android-based application are as follows.

3.1. Android

Android is an operating system used in mobile devices, known as the Mobile System, as for its Linux-based programming language. For developers, there is an open platform which means that everyone is allowed to develop an Android application system that can be used for the development of various mobile applications in the form of smartphones and tablets [8].

3.2 MySQL

MySQL is a database management system that is used to store separate data tables and place all the data in a different table and place all the data of one large warehouse [9]. To build an application that is open source and can be run on various platforms, then we need a software and database server system. Software that is often used in this Linux operating system environment is commonly referred to as MySQL. This software is under a General Public License or called GNU and is free, which is multiuser and multithreaded.

3.3 PHP

PHP is an open-source programming language, this programming language in the form of scripts that blend with HTML (integrated) located in a server that can be used for dynamic WEB pages. Emotional understanding in the mechanism of the page that appears is created at the time the client requests the page, so the information received will always be up to date or updated. This programming language is server–side-scripting therefore in PHP commands and the syntax will be executed on the server, and in HTML format the result is sent to the browser.

3.4 Sequence Diagram on Application Implementation

Sequence diagrams are the form of message flow in each object, an overview that provides a detailed explanation of each use case. In this diagram, it is explained that the vertical dotted line shows the flow of each object visible in a use case, the horizontal line depicting the object that sends the message.

3.5 Results

3.5.1 Sequence Diagram Client (Guardian)

Parents run the app and can display the main page menu, Profile database, conduct abuse counselling guidance especially children who behave Bullying and guidance history data (Figure 1).
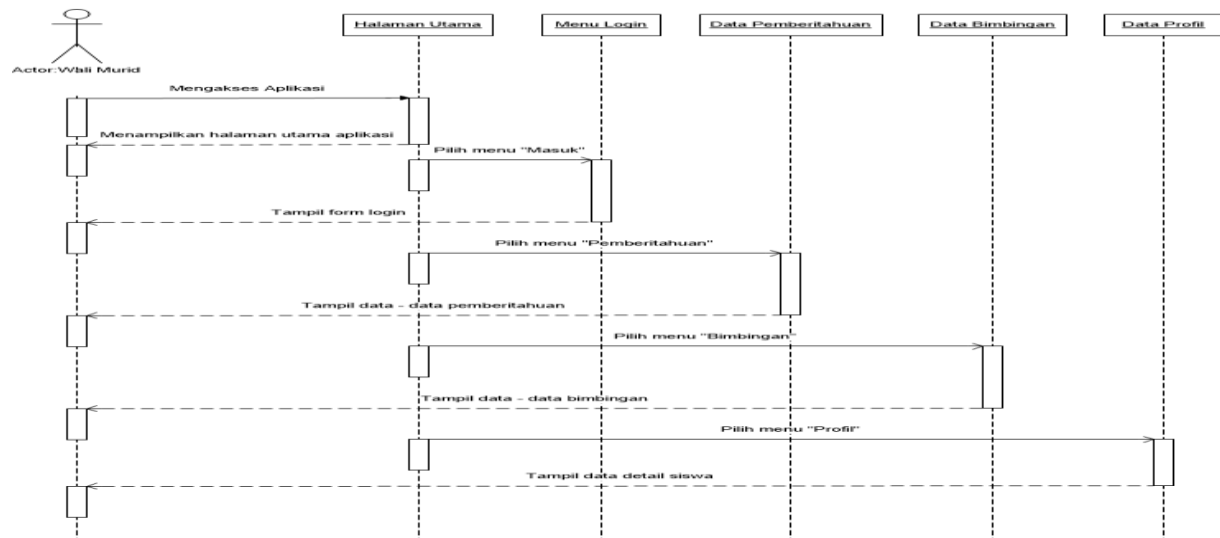
Figure 1. Sequence Diagram Client (Guardian)

3.5.2 Student List Menu

In the student list menu (Figure 2), Picture1A class teacher can edit or manage pages such as changing and deleting data. In editing teacher data given facilities, data filter column, breadcrumb that serves to display student data that has been filtered, while student data to be said is entered in the data list column.
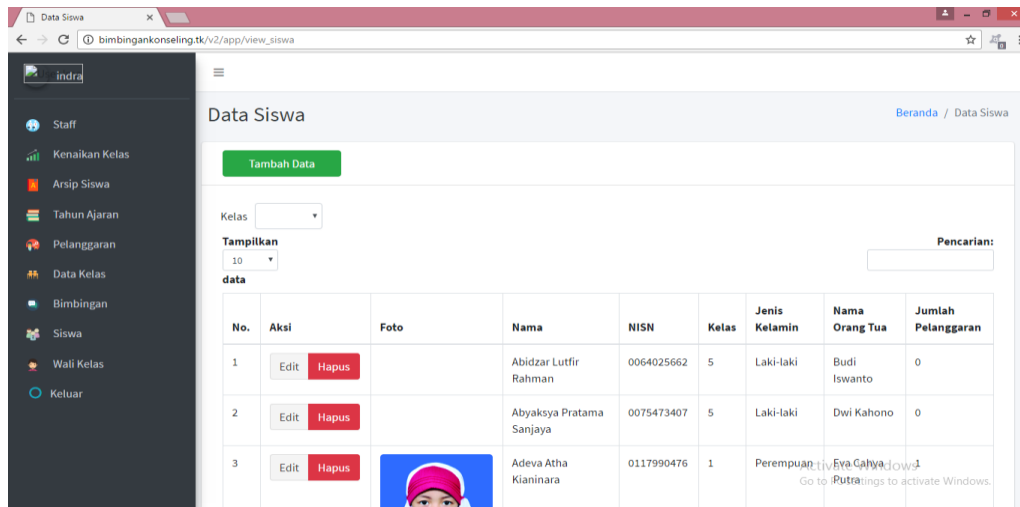

Figure 2. Student Data Menu

3.5.3 Consultation Menu

In the Consultation menu, there can be a question and answer process between the teacher and the student's parents (Figure 3, Figure 4 and Figure 5). In this menu, parents can send questions related to their children, ranging from activity questions, problematic behaviour, or complaints about how to handle the child if there is a problem. Teachers will be able to answer questions in real-time, and parents will get the answer. Note all these consultations can be documented in full by using this application. Similarly, the problem of violations committed by a protégé can be directly conveyed to his parents, and all forms of violations will be recorded in full.
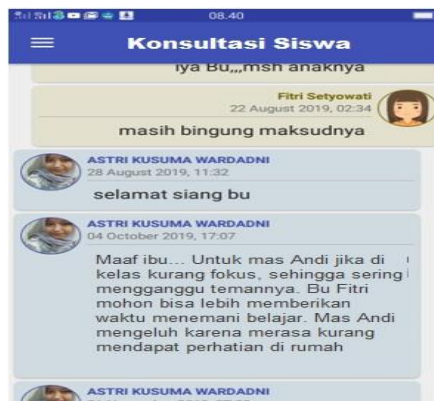
Figure 3. Consulting Menu

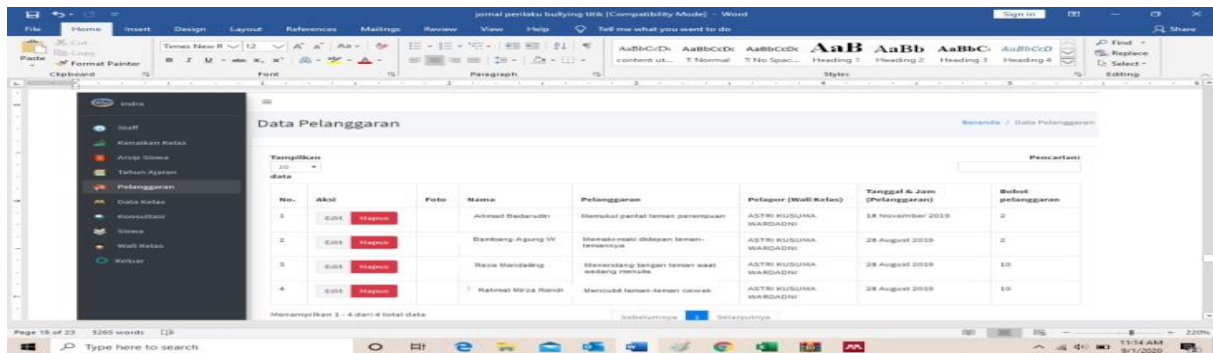**Figure 4**. Menu of bullying Behaviour Violations in School

Figure 5. Menu of Consultation Modification

3.6 Discussion
3.6.1 System Testing
This system test is done with the black box test model and alpha test required to test the feasibility of the system if the system can run as expected.

3.6.2 Application Usage Test
Test the results of bullying behaviour before and after parents use android-based apps as a medium of communication between teachers and parents at school and at home in addressing bullying behaviour by you.

Table 1. Paired sample (T-Test)

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre-test	14.3571	14	.92878	.24823
	post-test	5.5714	14	.75593	.20203

From table 1 output "Paired Samples Test" above also contains information about the value "Mean Paired Differences " is 14.3571 with a standard deviation of .92878 while the value after median usage is 5.5714 with a standard deviation of .75593. From the calculation results in table 1, it can be seen that it looks different between pre-test and post-test on the average product. So it can be concluded that this average value indicates that the association of adroit application usage has a significant impact on bullying behaviour. Before the use of the adroit application as a means of communication, teachers' and parent's bullying behaviour of children in school and at home was very high. After the use of the application as a means of communication, teachers and parents, then bullying behaviour is low. According to research conducted by Anis Pussitaningtyas that good communication will foster mutual trust between parents and teachers. The mutual trust, mutual help in the guidance of the child, and communication between parents and teachers will make the child feel the freedom of creativity to develop his potential, cannot increase creativity, and achieve success in learning [7].

Table 2. Correlation Table

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pre-test & post-test	14	.125	.670

From the results of the correlation analysis between the two data pairs in Table 2, the correlation coefficient is 0.125, with a significant 0.670. This suggests that the two data pairs are not correlated. This means that in the results of the use of the android application program as a means of communication of parents and teachers before using the application and afterwards there is a correlation, which means that this relationship indicates that the use of the adroit application has a cyclical impact on bullying behaviour. The decline in bullying behaviour can be seen with children who start coexisting, polite words, better character, not bullying behaviour anymore. This is reinforced by research conducted by Preciosa Alnashava Janitra & Ditha Prasanti, that family communication is the main foundation to prevent bullying behaviour for children [10]. Meanwhile, research conducted by Hasan Come et al. efforts to overcome the barriers of communication between parents in promoted the learning achievement of students at Sma Semesta Bilingual School Semarang can be done by building even better communication between the parents and parents of students. Student achievement increased by 19.12% after the interpersonal communication of the class with the parents of the students [11].

T-test to find out the utilization of communication applications of teachers and parents of students. In this test will be seen comparisons often not an adroit application as a medium of communication that occurs in daily life between parents and teachers. To decide whether the connection of contact with this application can be tested by making ho and ha hypotheses, it is accepted whether this hypothesis can be tested by the t-test method.

As for Conditions to draw conclusions based on the decision in the t-test are:

    a. Ho: If the value of significant results counts < from sig table (2-tailed 5%) then there is no influence on the use of the android application as a means of communication between teachers and parents of pupils in addressing bullying behaviour.

    b. Ha: if significant value count > of t sig table (2-tailed 5%), then there is the influence of the use of the android application as a means of communication of teachers and parents in dealing with bullying behaviour of early childhood in school or at home.

From the calculation results are obtained:

Table 3. Paired Samples Test

			Paired Differences				T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre-test - post-test	8.78571	1.12171	.29979	8.13806	9.43337	29.306	13	.000

In table 3, the paired-samples test displays the average difference between pre-test and post-test values. The test results found that the t value was 29,306 with a sig (2 tailed) of 0.001. This indicates that there is a difference between the pre-test value and the post-test value and therefore, the t value found to be positive, so it is chilling that the post-test cost is lower than the pre-test value. Post-test scores are lower due to more lousy bullying behaviour. It appears that the sig (2-tailed) amount is smaller than the table of 0.000<0.05. From this result can be concluded that Ho was rejected, which means the hypothesis that there is no effect of adroit application as a means of communication between teachers and parents. Receiving the Ha hypothesis indicates that there has been a decrease in bullying behaviour in the child. There is an increase in communication between parents and teachers after using android-based communication apps. In addition to testing the comparison of significance (Sig), from the results of the table information can also be determined whether this application affects the communication of parents and teachers by testing hypotheses by testing paired sample t-test, i.e. the comparison between the t value of the t-test table and the t-count score results. To determine whether the development of the hypothesis is acceptable or cannot be seen from the following conditions:

1. Ho. If the value t count < t table means accept Ho and accepting Ha
2. Ha: If the value t count < t table means accept Ho and reject Ha

From table 3 above we can see that this t count score of 29,306 shows that the average value of bullying behaviour decreased after the use of the adroit application as a medium of communication between parents and teachers in the school. For the next calculation is to look for the value obtained from the t-test table, to get this value we see first the amount of data, in this study the amount of data is N=14, and the freedom Degrees (pdf) is df=12 (from df=14-2) with a significance value ($\alpha/2$) = 0.025. This value is to match the list in the table, so the t value of the table from the distribution is 2.03693. The result of the t table value compared to the calculated value of 29.306 >2.145, it can be concluded or taken the decision that Ha can be accepted by rejecting Ho. By getting Ha means it is true that there is an influence on the use of the adroit application as a means of communication between parents and teachers or it can be shown that the average communication before and after using android-based apps does have a difference.

From this conclusion, intensely intertwined communication makes parents of students and teachers evident influence, with supervision and touch, making the child more well behaved, which is shown to change the character for the better. The child becomes more patient, friendly with friends, no more prolonged Bullying with his friend because it is always under the supervision of teachers and parents at all times. That the role of parents at home and teachers in school is vital for the child's education, so that good communication between parents and teachers is a necessity to achieve synergy between the two. This is confirmed from research that the effectiveness of communication between parents and teachers and parental monitoring of their child's activities conducted before and after using an adroit application with t spss test version 17, significant results (2-tailed), i.e. 0.000 (p<0.05) t-test results show there is a considerable influence on the use of adroit application impacting on the child's comfort in learning, more intense parental supervision, more disciplined children, not committing violations because they feel always supervised by parents and teachers. This change will undoubtedly make the child have better character, including improved learning achievement, which is shown by increasing the average math replay score from 7.57 to 7.99 [12].

4. Conclusion

After conducting needs analysis activities, design of program code design, and testing of adroit-based implementation application as a means of communication of teachers and parents at Taman Sari 3 Yogyakarta Elementary School, it can be concluded that the use of the adroit application as a means of communication of parents and teachers has a significant impact on improving bullying behaviour of early childhood in school and at home. This application can communicate via online messaging. The app can manage student data, teacher data, student data breaches, parent and teacher consulting data, school information. In this app, parents can see the violations committed by their child in school. Bullying behaviour in children one and two in Taman Sari Elementary School 3 is resolved and at a low level. Parents of students get information in real-time, and parents can monitor their child's behaviour at school. Teachers can pass on information about violations to their parents directly so that parents trust the school more. This trust is realized by better communication and more intensive parental supervision of the child. It is hoped that the school can improve discipline in the school and provide counselling guidance on bullying behaviour. Teachers are expected to play an active role in preventing bullying in schools, giving good examples, reducing acts of violence. Parents are expected to guide the child with teaching and example and not let the child do anything without parental supervision, monitoring the child's development, especially the child's emotional and social development. All of this will have an impact on the child's comfort in learning, more intense parental supervision, the child becoming more disciplined, not committing Bullying or violations because he feels always supervised by his parents and teachers.

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