

DEVELOPING SPEAKING MATERIAL BASED ON THE TOTAL PHYSICAL RESPONSE (TPR) METHOD FOR THE EIGHT GRADE STUDENT

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Abstract

The background of the development of speaking material based on Total Physical Response (TPR) is looking at the state of the learning method in general. The objectives of this study analyzed the process of development, validity, practicality, and effectiveness of the method for teaching speaking based on the 2013 of problems: 1) developing speaking material based on Total Physical Response (TPR) for the eighth-grade student. 2) The feasibility the developing speaking material based on the Total physical response (TPR) Method for the eighth-grade student.

The researcher applied the research and development (R&D) from Sugiyono (2016). The data were collected in only 8 steps. The subject of this study was VIII B at MTS Syech Subakir Nglegok which consist of 30 students who participated the in the testing activities. The collection techniques used were observation through interviews and Questionnaire. Experts' validation and students learning outcomes tests. While the data analysis techniques used were validity analysis, practical analysis, and effectiveness analysis of learning speaking based on the Total Physical Response (TPR) Method.

The results of the design and development show that the model Total Physical Response is valid, the average of the two material experts, media experts, and learning experts is 80%. The test results show that the model is effective. This research was conducted in class VIII MTS Sheikh Subakir Nglegok. The class consists of 30 students involved in the needs analysis and trials that use the method of one experimental design group pre and post-test. The pre-test (57,75) results increase in the post-test (78) results. In the paired sample t-test, the t-count is 17,71 with a t-table of 3,767. The product is valid and can be used as a medium in the teaching and learning proses. The English-speaking material based on Total Physical Response was completed with the teacher and student book. It made the teacher easily use the method. The Total Physical Response (TPR) Method enchanted the students' speaking and Appropriate with the 2013 Curriculum.

Keywords: *Total Physical Response, Speaking, Teaching Method*

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1. INTRODUCTION

English is an important language for all kinds of professional and personal goals. Learning English can help me pursue and obtain more career opportunities. Nowadays, many companies need employees who can communicate with the world which means finding employees who speak English. According to (Nunan, 2012) in the business world, industry, and government, workers are expected to immediately improve their English language skills (Puspitasari et al., 2022). Therefore, parents want their children to get English teaching as early as possible to get benefits for academic and career interests and future business (Sad, 2010).

In education, English is able to help students to learn about foreign cultures in the world and introduce their culture to other people from other countries (Dewi, 2019). In Indonesia, English is learned by kindergarten until university students. According to Article 37 paragraph 3 of Law Number 12 of 2012 reads "Foreign languages can be used as the language of instruction in Higher Education". Then, According to Article 29 paragraph 2 of Law Number 24 Year 2009 reads "An introductory language supporting paragraph (1) can use language for purposes that support the use of students".

According to the results of observations that have been done by the researcher. The descriptive observation focused on school conditions and sub focus with class conditions have not found a speaking learning media for speaking learning. The teaching and learning process is still only using LKS. The fact, learning media should not only use LKS but must use other learning media that can support the lesson (Puspitasari et al., 2022; Wijaya et al., 2020; Zubaidah et al., 2020). The focused observation was the teaching process, the teachers used curriculum 13 that has been revised in 2017. The process of learning English is also still using Javanese and Indonesian (Lestariyana & Widodo, 2018). The remaining speaking mastery is also still very low. The teacher also has not introduced Total Physical Response to his students (Kuhar, 2018). New speaking should be always introduced before the lesson started to make it easier for students to understand the lessons to be learned (Haynes, 2007). Total Physical response must be introduced as early as possible considering a lot of speaking that does not only have one meaning which students must know (Er, 2013).

Based on the interview with the English teacher and some students that have been done by the researcher, there were still obstacles in the teaching and learning process, the student's learning interest was very low and the absence of speaking learning media to enrich student speaking achievement, and the result of interviews with the students, they also had problems when they were communicating using English, they did not understand speaking and Total

Physical Response word. They wanted to learn more easily and fun about speaking and Total Physical Response words, so they could use English properly.

Based on the policy study and field study which has been done, the researcher is interested to develop the handbook as a learning picture media. Which is the handbook was an interesting picture to make students learn to speak easily. The handbook not only presents pictures but there are also presents Indonesian meanings of speaking (Cahyono & Widiati, 2009). The Indonesian meaning is not only one meaning, but the researcher also presents the Total Physical Response of speaking, there are two Indonesian meanings from one English speaking (Adinda, 2023). The handbook provides fun exercises for students speaking achievement. Therefore, the title of this thesis is “DEVELOPING SPEAKING MATERIAL BASED ON TOTAL PHYSICAL RESPONSE (TPR)

METHOD FOR THE EIGHTH GRADE STUDENT”. With the interesting handbook picture media, both teachers and students can make the process of learning and teaching easily increase the speaking achievement of students.

2. LITERATURE REVIEW

In learning English, there were four skills. They were speaking, writing, reading and listening. However, in this research, researcher only concerned with speaking skill. Speaking was the most important skill in English that should be mastered. Speaking was an activity which always did with anyone and in a variety of situations. According to Bashir (2011) speaking is productive skill in the oral mode. Speaking has an important role in daily life that is to convey someone's mind directly. Then, Sepahvand & Marburg (2014) argues that there are some reasons to put speaking as the first aim of study such as personal satisfaction from being able to speak and reaching other interests or career goals.

Based on the 2013 Curriculum (K-13) request that students must be more active in the learning process (Burhaein et al., 2020). Need to improve the way the teaching and learning process is carried out, from the use of conventional methods such as demonstrations 2013 curriculum is a curriculum that emphasizes scientific and thematic approaches. The 2013 curriculum orientation is an increase and balance between attitude, skills and knowledge competencies (Hidayat, 2013). Improvement and balance between competency attitudes, skills, and knowledge is strongly supported by the teacher's strategies inside and outside the classroom (Darling-Hammond, 2017). One of the strategies used by teachers is to design learning media to facilitate students in understanding learning material (Roemintoyo & Budiarto, 2021). Learning media can be interpreted as something that delivers messages to recipients of messages (Herawati et al., 2021).

Based on the background of the problem above, the researcher conducted a research on the development of the total physical response based handbook method to improve the speaking skills of 8th grade students. The existence of learning media using this illustrated handbook, is expected to help students in vocabulary mastery and speak English, so that they can achieve good results and provide convenience to the teacher in an effort to provide English material. In addition, researchers also expect the presence of Media handbook can provide a learning media in MTS S.S that can be used by teachers in learning to speak English and can be a learning method in learning to speak English so that learning becomes more interesting.

3. METHODS

The researcher intended to obtain approaches to model development by using limited tryouts. This research used a qualitative approach. The researcher used qualitative and quantitative approaches to analyze data. The result of the interview, observation, and field notes presented descriptively to know the effectiveness and suggestion about the product. While the result of the questionnaire given to the eighth-grade students, pre-test, post-test, and validation experts apply in quantitatively. According to (Sugiyono, 2013), the methods of research and development are the research methods used to produce a specific product and test its effectiveness of the product. The product result of this research is Macromedia Flash a learning media for teaching speaking that can be used at vocational schools. According to Sugiyono (2016), the form of research data is numbers and the purpose of the research is to trial the hypothesis that has been set.

The design of this research was Research and Development. The purpose of this research was to develop a new product to be applied in students' environments and enhance students' speaking skills (Primasari et al., 2021). Research and development is a research method used to produce a certain product and test the effectiveness of a certain product (Sugiyono, 2017). This definition matches the research that will be conducted by the researcher. The product was developed to fulfill the needs of students' environments. The product is planned to be developed as a Comic Strip to Improve Speaking Skills (Primasari, 2020).

The research frame work of this research was adapted from sugiyono.
 As shown as figure below:

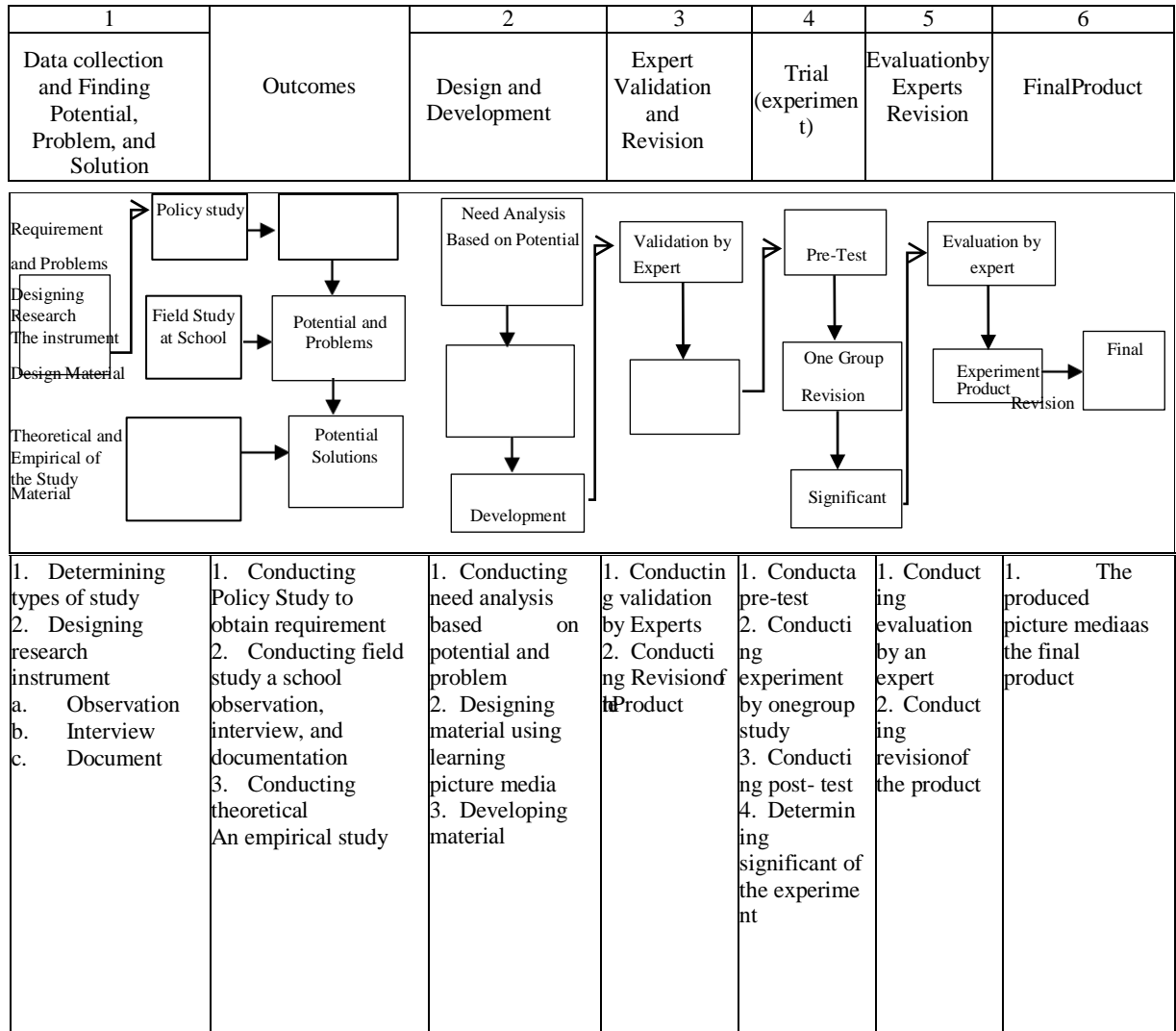


Figure 1 The Research Framework

In this research there are six procedures to develop the product; 1) Data collection, finding potential problems, and solutions, 2) Design and Development, 3) Expert validation and revision, 4) trial (Experiment), 5) Evaluation by Expert and revision, 6) Final product. These six procedures were elaborated into six phases of this research which consist of 1) Foundational research of preliminary study (phase I), 2) Design and development (phase II), 3) Expert validation and revision (phase III), 4) Trial (phase IV), 5) Expert evaluation and revision (phase V), 6) Revision and producing final picture media (phase VI).

4. RESULTS AND DISCUSSION

4.1. Phase I Foundational Study (Potential and Problem)

The analysis of data collection and finding potentials and problems was conducted as the first step of this research to find out the target and learning needs of the students. The data collection and finding potentials and problems was conducted on February 6th2019. It was done by observations, interviews, and documentation at MTS SSN in the academic year 2018/2019. The results of the data collection and finding potentials and problems are explained as followed.

4.1.1. Policy Study

The researcher has conducted a policy study, namely from the regulation of the Minister of Education and Culture number 64 of 2013, from the teacher as the only source of learning into learning based on various learning resources. But in practice, both teachers and students still face many problems in the learning process. So far the majority of English language learning is delivered by the lecture method and the use of learning media is very minimal. English learning can be supported by utilizing learning media. The use of learning media at the learning orientation stage will greatly help the effectiveness of the learning process and the delivery of messages in learning. In addition, it can also increase students' motivation and interest in learning and improve student understanding.

4.1.2. Field Study

The data was collected by using observation, interviews, and documents. In data collection and finding potentials and problems, the researcher did three observations. Based on the three kinds of observations, their searcher found potential problems as follows; 1) The students needed interesting and easy-to-understand learning media to facilitate speaking learning. 2) Students needed innovative teaching performance to change the class atmosphere. 3) The teacher needed more English teaching material to assure that the teaching and learning process of writing run well.

4.1.3. Interviews

The first interview was done by the researcher with the English teacher. This interview was done by the researcher when the English teacher finished the lesson in the teacher's room. The result of this interview showed that there were teachers' problems with speaking ability, they were:

- 1) The teacher needed the model of speaking learning.
- 2) The teacher needs to learn the Total Physical Response words to increase students' speaking.

- 3) The teacher needed innovative learning media to teach speaking easily and pleasantly.

Second interview toward to two English students' opinions about English speaking, Total Physical Response word, and learning media. The interview done by the researcher used an open-ended interview. The result of both interviews showed that the student's problem with English speaking was: 1) The speaking achievement of students are low. 2) The students need to learn Total physical Response words to increase their speaking, and, 3) The student needed an innovative learning media to learn peaking easily and pleasantly.

4.1.4. Documentation

In data collection and finding potentials and problems, the researcher has collected data in the field study. The documentation consisted of students speaking scores. The researcher got this documentation from the English teacher. The researcher collected and analyzed the students' writing scores.

Based on documentation that has been done, In the VII class which consisted of 24 students, 17 students got 50 scores, 6 students got 55 scores, and 1 student got 60. The mean score was 51,66. The English standard minimum criteria was 75. It means all of the students in the VII class are under the average score. The score of the students speaking is weak.

This potential problem was been so obvious that the researcher needed to find a potential solution. The researcher developed a handbook picture media about speaking with the theme of imperative sentences and prohibition sentences. Researcher limit inputted speaking to handbook picture media, which is only speaking that has more than one meaning. The researcher include, Total Physical Response words in the speaking that is being studied by students. Thus, students can learn to speak easily while knowing Total physical Response words or other meanings of speaking through The Handbook of Miracle Speaking.

The data were analyzed by using the interactive technique of data analysis(Miles & Huberman, 1984). The result of the field study was compared with the results of the policy study to obtain problems. To ensure the validity and reliability of the data, the researcher used triangulation and members checklist (Miles & Huberman, 1984). The researcher used two methods of triangulation, they were triangulation of source and triangulation of method. The triangulation sources were conducted by comparing the results of interviews among the teacher and the students.

In this phase, the researcher used the content analysis technique theories of Miles and Huberman and Preliminary research. Results of this analysis were also conducted to ensure of field study to obtain information and potential solution.

4.2. Phase II Product Design and Development

In phase II the researcher intended to design and develop models of Total Physical Response Words picture Media Based Handbook to Improve the Speaking Achievement of 7th Grade students. At this phase, the researcher used an instructional design and development approach following the ADDIE model (Branch, 2009). ADDIE is the acronym for Analyze, Design, Development, Implement, and Evaluate (Branch, 2009). Because ADDIE is merely a process that serves as a guiding framework for complex situations, it is appropriate for developing educational products and other learning resources. Therefore, the ADDIE approach was applied by the researcher to conduct instructional materials.

The hypothetical model as follow:

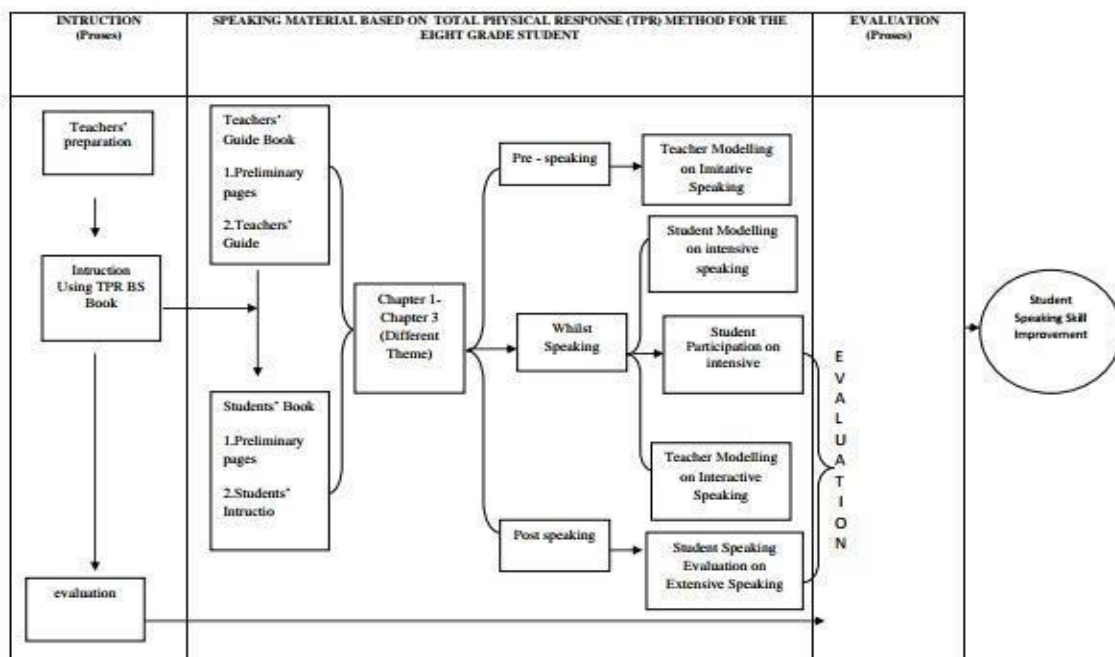


Figure 3.4 The Hypothetical Model Of Speaking Material Based On Total Physical Response (TPR) Method For The Eight Grade Student (Within Process).

The researcher made a learning median titled "Daily activity using Physical Response". The researcher made learning media with 3 sections completed with exercises in each chapter. Completed with teacher and student guidebook.

4.3. Phase III Expert Validation and Revision

The validation done by the researcher is based on the criteria stated on the criteria of the picture media. They were; 1) The worthiness of the handbook picture media which accordance with standards competency and basics competency, in accordance with students' characteristics, the truth of material substance, increase students' knowledge, in accordance with values, morality, and sociality, and increase students' motivation to learn. 2) The grammatical of the handbook picture media which is legibility, clarity of information, clear instruction, accordance with the level of students' thinking, compatibility with language rules, effective uses, and efficient uses. 3) The design of the handbook picture media which is The type and size of the font, interesting picture, color uses, the paper uses, the neatness of prints and binding, and durability of the handbook picture media.

The results of the validity of the final product were 79,1%. Therefore, this Handbook of the Total Physical Response Media was valid. The product received several visions from experts.

- 1) The validators are the expert of the part, they are the expert of material Yusniarsi Primasari, M.Ed, Adin Fauzi, M.Pd, Lusinur S, Pd. The expert of media was lucky prianto, M.Pd, Ida Putriani, M.Pd, Angga Luky Mahendra, S.Kom.

- 2) Phase IV Trial (Experiment)

The researcher was done the pre-test with 4 types of questions about speaking. The instrument test was through a validity and reliability trial of 10 students. The researcher used the Pearson validity formula for the validity test followed below:

$$r_{xy} =$$

The researcher used the t-test to test the results of significant score relation. The criteria of determine the significance is by comparing the t-count value and t-tables.

$$T_{\text{count}} = \frac{r_{xy} \sqrt{(n-2)}}{\sqrt{(1-r_{xy}^2)}}$$

The correlation coefficient formula:

$$\frac{\frac{n \sum ij - (\sum i)(\sum j)}{\sqrt{(n \sum i^2 - (\sum i)^2)(n \sum j^2 - (\sum j)^2)}}}{\frac{\sqrt{(10 \times 58700 - (750)^2)(10 \times 6000 - (760)^2)}}{587000 - 570000}} = \frac{\frac{\sqrt{(587000 - 562500)(60000 - 577600)}}{17000}}{\frac{\sqrt{24500 \times 22400}}{17000}} = \frac{0,725675}{\sqrt{548800000} / 23426,481}$$

The Spearman-Brown formula:

$$r_i = \frac{2r}{1+r}$$

$$r_i = \frac{2 \times 0,725675}{1 + 0,725675} = \frac{1,451349}{1,725675}$$

$$r_i = 0,841033$$

The reliability value is 0.841. Based on the trial this value is reliable because it is greater than 0.600. So, the instruments used are reliable, the instruments can be used for measurement in order to collect data.

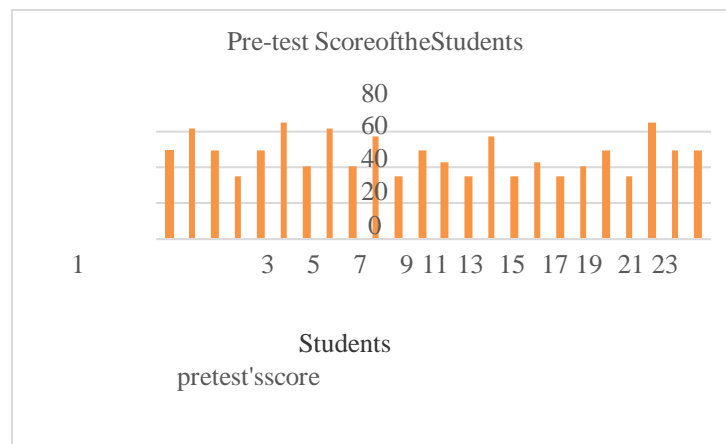


Figure 3 The post-test score

The researcher implemented the handbook learning media to VII class. First, the researcher explained the handbook namely: explained the cover, the aims of the handbook, and the components of the handbook. Then, the researcher explained about speaking and Total Physical Response word. The researcher started teaching speaking using the big book. The researcher drilled the speaking and followed by the students.

The drill was repeated 3 times and then the researcher opened the questions and answers.

The researcher has given the example of a table exercise on the board and followed by the students, Then the researcher started to do classical exercise and followed by students enthusiastically. After the classical exercise finished, the researcher asked two students to play the hangman game. The researcher was given the instruction to play the hangman game. The pair of students who have been asking to play sat face to face and started to play. Finally, the researcher asked the students to make the sentences as explained below:

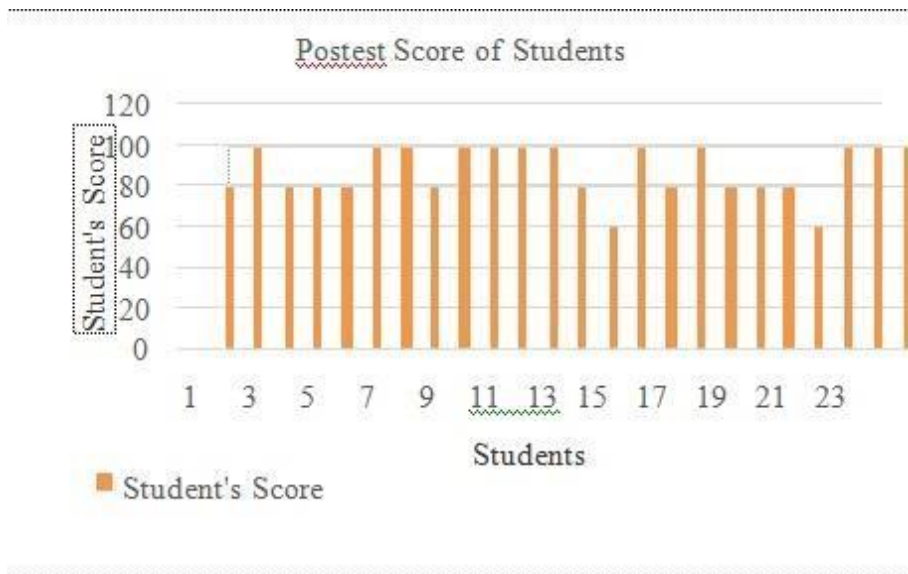


Figure 4 The Post-test score

The analysis t-test of VII class:

$$SD = \frac{\sqrt{\frac{\sum D^2 - (1+n)(\sum D)^2}{n-1}}}{\frac{10,0271}{\sqrt{24}} \cdot \frac{s_D}{\sqrt{n}}} = \frac{\sqrt{\frac{3385 - (1+24)(870)^2}{24-1}}}{\dots}$$

$$\sqrt{\frac{2312,5}{23}} = 10,0271 S = 2,04678$$

$$t = \frac{47,2917 - 83,5417}{2,04678} = -17,7107$$

t table=3,767 tcount=17,7107

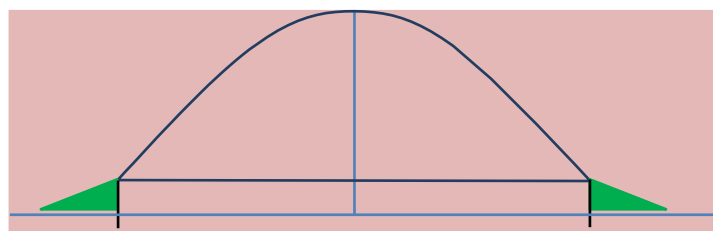


Figure 5 The analysis-test

Conclusion:

H0 rejected, so it was concluded that there is a significant influence of Total Physical Response Word Picture Media Based Handbook to Improve Speaking Achievement of 7th Grade Students.

4.4. Phase V Product Evaluation

In this phase, the researcher got evaluation and revision from the experts. The experts evaluated the product design based on the following criteria: 1) The worthiness of the Picture media, 2) The presentation of the picture media. 4) The design of the picture media. The product evaluation was obtained after the researcher had done the validation product and trial product. In the product evaluation, the researcher got suggestions for the final product.

4.5. Phase VI Final Product Publication

The last step of this research was the final product publication. The researcher created the final product. The product has feasible to use in the learning process that is appropriate to the 2013 curriculum. The final model of Total Physical Response Word Picture Media based Handbook to Improve speaking achievement of 7th Grade Students entitled “The Handbook of Miracle Speaking”. The English materials were published in three forms of books. Which were The Handbook, Teacher’s guidebook, and student’s guidebook. The handbook consisted of; the outside cover, copyright page, inside cover, interface, about this book, table of content, theme 1, theme 2, theme 3, theme 4, theme 5, reference, motivation page, and bibliography of the author for the back cover.

The final hypothetical model of the product was served in the figure below:

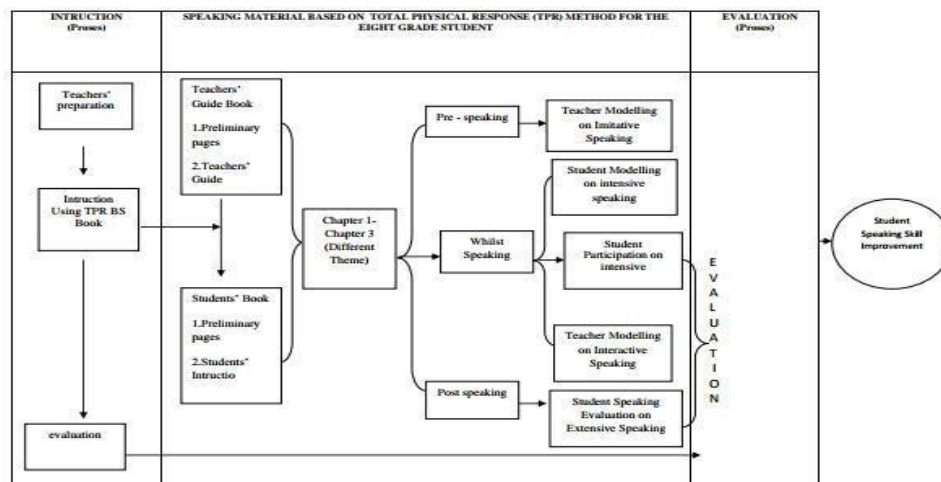


Figure 6 The handbook Final Model

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5. CONCLUSION

Based on the result of the research, the researcher concluded that the model of the Handbook was an effective model and appropriate for teachings peaking based of 7th grade students. The final product consisted of vocabulary and pictures, classical exercise, pair exercise, and individual exercise. In classical exercise, there was a puzzle such as an initial activity to build the student’s expectation. Inspire exercise there was a game to make a fun atmosphere in class. In individual evaluation, the students work independently to answer the exercises in the individual evaluation section (Hadi et al., 2023). The research result showed that the Total Physical Response to Word Picture Media to Improve the Speaking Achievement of 7th Grade Students has been contributing to the improvement of students speaking achievement. The product gave a significant effect on the students’ speaking achievement, that shown by the result of the post-test higher than the pre-test.

REFERENCES

- Adinda, N. M. (2023). *THE IMPLEMENTATION OF TOTAL PHYSICAL RESPONSE METHOD IN TEACHING ADJECTIVE FOR YOUNG LEARNERS*.
- Bashir, Z. (2011). , *et al. Bashir Z.*
- Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer.
- Burhaein, E., Tarigan, B., & Phytanza, D. T. P. (2020). The experiences and understandings of the K-13 curriculum implementation of Indonesian teachers of Adapted Physical Education (APE). *ISS*.
- Cahyono, B. Y., & Widiati, U. (2009). The teaching of EFL listening in the Indonesian context: The state of the art. *Teflin Journal*, 20(2), 194–211.
- Darling-Hammond, L. (2017). Teacher education around the world: What can we learn from international practice? *European Journal of Teacher Education*, 40(3), 291–309.
- Dewi, P. (2019). Teaching English for young learners through ICTs. *Humanitatis: Journal of Language and Literature*, 6(1), 11–24.

- Er, S. (2013). Using total physical response method in early childhood foreign language teaching environments. *Procedia-Social and Behavioral Sciences*, 93, 1766–1768.
- Hadi, S., Fatria, N. A. E., & Primasari, Y. (2023). EFFECTIVENESS OF ONLINE LEARNING AS A FORM OF INDEPENDENT LEARNING AT NAHDLATUL ULAMA UNIVERSITY BLITAR. *JOSAR (Journal of Students Academic Research)*, 9(1), 87–94.
- Haynes, J. (2007). *Getting started with English language learners: How educators can meet the challenge*. ASCD.
- Herawati, A. F., Siregar, A., Yusrizal, Y., Rahma, A. A., Sari, A. L., & Irwandi, I. (2021). Utilization of E-Learning as media in Indonesian language courses in higher education post covid-19 pandemic. *AL-ISHLAH: Jurnal Pendidikan*, 13(3), 2757–2766.
- Hidayat, H. S. (2013). Pengaruh kerjasama orang tua dan guru terhadap disiplin peserta didik di sekolah menengah pertama (SMP) negeri kecamatan Jagakarsa-Jakarta Selatan. *Jurnal Ilmiah Widya*, 1(2), 92–99.
- Kuhar, R. (2018). *Total Physical Response in Early English as a Foreign Language Teaching*. University of Zagreb. Faculty of Teacher Education.
- Lestariyana, R. P. D., & Widodo, H. P. (2018). Engaging young learners of English with digital stories: Learning to mean. *Indonesian Journal of Applied Linguistics*, 8(2), 489–495.
- Miles, M. B., & Huberman, A. M. (1984). Drawing valid meaning from qualitative data: Toward a shared craft. *Educational Researcher*, 13(5), 20–30.
- Nunan, D. (2012). *Learner-centered English language education: The selected works of David Nunan*. Routledge.
- Primasari, Y. (2020). EFFECTIVENESS OF THE ADVENTURE OF TIMUN EMAS GAME IN IMPROVING THE READING SCORE OF INFORMATICS ENGINEERING STUDENTS. *JOSAR (Journal of Students Academic Research)*, 5(2), 75–82.
- Primasari, Y., Sari, H. P., & Sutanti, N. (2021). The chain writing method in learning writing for information technology faculty students: the effectiveness. *JARES (Journal of Academic Research and Sciences)*, 6(2), 49–58.
- Puspitasari, H., Maharani, R. F., Setyawan, W. H., & Primasari, Y. (2022). Android-Based Mobile Application for Vocabulary Learning. *Jurnal Pendidikan Dan Pengajaran*, 55(3).
- Roemintoyo, R., & Budiarto, M. K. (2021). Flipbook as innovation of digital learning media: Preparing education for facing and facilitating 21st Century learning. *Journal of Education Technology*, 5(1), 8–13.
- Sad, S. N. (2010). Theory-practice dichotomy: Prospective teachers' evaluations about teaching English to young learners. *Journal of Language and Linguistic Studies*, 6(2), 22–53.
- Sepahvand, K., & Marburg, S. (2014). Identification of composite uncertain material parameters from experimental modal data. *Probabilistic Engineering Mechanics*, 37, 148–153.
- Sugiyono, S. (2013). Educational Research Methods (Quantitative Approach, Qualitative and R & D). *Bandung: Alfabeta*.
- Sugiyono, S. (2016). Metode penelitian kuantitatif, kualitatif, R&D. *Bandung: Alfabeta*.
- Sugiyono, S. (2017). Metode penelitian & pengembangan. *Research and Development*. Alfabeta.
- Wijaya, T. T., Ying, Z., Chotimah, S., & Bernard, M. (2020). Hawgent dynamic mathematic software as mathematics learning media for teaching quadratic functions. *Journal of Physics: Conference Series*, 1592(1), 12079.
- Zubaidah, S., Mahanal, S., Sholihah, M., Rosyida, F., & Kurniawati, Z. L. (2020). Using remap RT (Reading-concept mapping–reciprocal teaching) learning model to improve low-ability students' achievement in biology. *CEPS Journal*, 10(3), 117–144.