

Submitted	: 30 th September 2020
Revised	: 4 th December 2020
Accepted	: 18 th December 2020
Published	: 23 rd December 2020

SMART TREES MEDIA TO HELP IMPROVING PUPILS' COUNTING PROFICIENCY IN A KINDERGARTEN

Mohammad Archi Maulyda¹, Siti Istiningasih², Vivi Rachmatul Hidayati³,
Ratih Ayu Apsari⁴, Chuthamar Suwanmani Asian⁵

email: archimaulyda@unram.ac.id¹, istiningasih92@gmail.com²,
vivirachma@unram.ac.id³, ra.apsari@unram.ac.id⁴,
chuthamar_suwanma@ahsgs.uum.edu⁵

Departement of Training Teacher and Education, Universitas Mataram^{1, 2, 3}

Departement of Mathematic Education, Universitas Mataram⁴

School of Education and Modern Language, Universiti Utara Malaysia⁵

Jalan Majapahit No.62, Gomong, Selaparang, Mataram,

Nusa Tenggara Barat 83115, Indonesia^{1, 2, 3, 4}

Library St. 06050 Changlun, Kedah, Malaysia⁵

Abstract: Based on the results of a preliminary study conducted on 20 children, the number of children who got 4 stars was 3 children with a percentage (15%), 3 stars were 4 children with a percentage (20%), 2 stars were 3 children with a percentage (15%), while those who got 1 star were 10 children with a percentage (50%). This shows that there are still many children who have not been able to count from 1-10, which means that many children have not achieved their learning completeness. For this reason, it is necessary to take action so that children's learning completeness can be achieved. The purpose of this study was to see the effectiveness of using smart tree media in improving children's numeracy skills 1-10. The design chosen for this study was the Kemmis and Taggart Classroom Action Research Model with 3 cycles. The data collection techniques used are performance techniques to collect data about students' numeracy skills and observation techniques to collect data about the learning process when each action cycle is carried out. The results of the data analysis showed that after the third cycle was completed, the learning completeness of the children reached 80%, meaning that there were 16 children who achieved learning completeness. The conclusion is that smart tree media can improve numeracy skills 1-10 in group A children at An-Nur Labuapi Kindergarten.

Keywords: basic counting, early childhood, manipulative media

MEDIA POHON PINTAR UNTUK MEMBANTU MENINGKATKAN KECAKAPAN BERHITUNG SISWA SEBUAH TAMAN KANAK-KANAK

Abstrak: Berdasarkan hasil studi pendahuluan yang dilakukan pada 20 anak, 3 anak (15%) mendapat 4 bintang, 4 anak (20%) mendapat 3 bintang, 3 anak (15%) mendapat 2 bintang, dan sisanya 10 anak (50%) mendapatkan 1 bintang. Hal ini menunjukkan masih banyak anak yang belum dapat berhitung dari 1-10, yang berarti banyak anak yang belum tercapai ketuntasan belajarnya. Untuk itu perlu adanya Tindakan yang dilakukan agar ketuntasan belajar anak dapat tercapai. Tujuan dari penelitian ini adalah melihat efektivitas penggunaan media pohon pintar dalam meningkatkan kecakapan berhitung 1-10 pada anak.

Desain yang dipilih untuk penelitian ini adalah Penelitian Tindakan Kelas Model Kemmis dan Taggart dengan 3 siklus. Teknik pengumpulan data yang dipergunakan adalah teknik unjuk kerja untuk mengumpulkan data tentang kemampuan berhitung peserta didik dan teknik observasi untuk mengumpulkan data tentang proses pembelajaran pada saat setiap siklus tindakan dilaksanakan. Hasil analisis data menunjukkan bahwa setelah siklus III selesai dilaksanakan ketuntasan belajar anak mencapai 80%, artinya anak yang mencapai ketuntasan belajar berjumlah 16 anak. Kesimpulannya adalah bahwa media pohon pintar dapat meningkatkan kecakapan berhitung 1-10 pada anak kelompok A TK An-Nur Labuapi.

Kata-kata Kunci: anak usia dini, berhitung dasar, media manipulatif

INTRODUCTION

Early childhood education is the level of education before the basic education level which is a coaching effort aimed at children from birth to six (Bartholdsson, 2020; Simão et al., 2014). Early childhood education is very important to be implemented as the basis for the formation of a complete human personality, namely character building, character, intelligent, cheerful, skilled and devout to God Almighty (Roza et al., 2019; Astuti, 2016). According to Soyadı (2015) that learning during the golden age is an instrument to facilitate children's growth and development in order to reach the stages according to their developmental tasks. Aspect that must be developed in early childhood education are cognitive development. According to Visser & Flynn (2018), cognitive aspects in children can be described from the activity of grouping objects that have the same color, shape and size, matching circles, triangles, and squares and recognizing and counting numbers 1-20. Counting skills are very much needed in everyday life, especially the concept of numbers that children should be familiar with (Hidayati et al., 2020; Yusnia, 2018).

Increasing the ability to count early in early childhood will run smoothly if it is supported by the proper media in its implementation to improve the early counting skills for early childhood (Naidoo & Petersen, 2016; Zsolnai & Kasik, 2014). Based on the results of a short interview with the teaching teacher, the reality shows that learning at An-Nur Labuapi Kindergarten is less attractive to children. It is evident by children's works that showed limited understanding to recognize numbers, and there are still many children who have difficulty pronouncing numbers. Researchers made preliminary observations on 20 children at An-Nur Labuapi Kindergarten as subjects. Subjects were given number recognition questions and simple numbers to see their understanding of them. The results of initial observations can be seen in the following graph:



Figure 1. Results of Researcher's Preliminary Observations

Based on the observations made on group A children at An-Nur Kindergarten, the following scores were obtained. Of the 20 children who were given the test, 3 children (15%) got 4 stars, 4 children (20%) got 3 stars, 3 children (15%) got 2 stars, and the remaining 10 children (50%) got 1 star. This is in line with the research results of Nurfahrudianto et al. (2017) where this study wants to see the effectiveness of using coin as media for understanding numbers and numbers for early childhood. The results of this study indicate that children are more interested in learning if they use real media (can be held) or are operationalized. Besides, according to the research results of Aguiar et al. (2019) in children aged 5-6 years, children prefer to learn practically not theoretically.

In this study, researchers used Classroom Action Research (CAR) method because the method used in the research of Rosyidah et al. (2020) only qualitative descriptive, the absence of the researcher in the use of the media will make the results of this study more objective. Classroom Action Research (CAR) is used because the initial problem was discovered in the classroom. So that the research carried out will be more specific and clearer using this classroom action research method. In this study, researchers will use smart tree media as a form of operational media for students according to the results of the study (Aguiar et al., 2019). Researchers hope that the results of this study can complement the results of previous studies related to number recognition in early childhood. In particular, the researcher wants to improve children's skills in counting 1-10 through learning using smart tree media.

RESEARCH METHODOLOGY

This study used a Classroom Action Research approach with the Kemmis and Taggart model which was carried out in three cycles (Fitria, 2015). Each cycle consisted of four components with the research subjects being group A children at An-Nur Kindergarten, Labuapi District, West Lombok Regency. The data collection techniques used were performance and observation techniques. The data analysis technique used is descriptive quantitative by comparing the completeness before and after the action is carried out. An action is declared successful if the completeness reaches at least 75% (Julianingsih, 2018). The following are the stages of the PTK model of Kemmis and Mc Taggart (Ainon Mardhiah, Yusrizal, 2017).

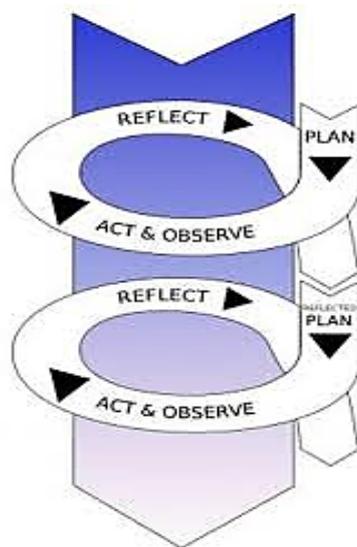


Figure 2. Kemmis and Taggart's CAR Cycle Design (Mertler, 2017)

The research activity carried out was to compile an action plan, including revising changes to action, and identifying problems from the implementation of previous action problems. The components in each cycle are as follows:

1. Implementation of action in this stage learning is carried out as planned. The planning stage begins with the making of the lesson plan and the test instrument for each cycle.
2. Actions taken by the teacher as an effort to increase the number of children who complete learning. The implementation of action is a class learning activity as a realization of the theory and teaching and learning strategies that have been adjusted and refers to the appropriate curve, and the results obtained by the process are expected to increase the collaboration between researchers and research subjects so that they can provide reflection and evaluation of what is happening in the classroom.
3. Observations are made during the learning activities using observation sheets, in which they are carried out continuously from cycle I to the next cycle.
4. Reflection is a stage for the processing of data obtained during observations. Reflection is carried out with actions that have been carried out in each cycle to fix the results of the action. The purpose of reflection is to obtain data that shows whether there is success or failure to take action in the next cycle.

FINDINGS AND DISCUSSION

Finding

The results of children's assessments of counting abilities 1-10 through smart tree media from the pre-action cycle, cycle I, cycle II, cycle III can be summarized in the table below:

Table 1.
Learning Outcomes of Cycle I, Cycle II, and Cycle III

No	Learning Outcome	Pre Action	Cycle I	Cycle II	Cycle III
1	★	50%	15%	10%	5%
2	★★	15%	30%	25%	15%
3	★★★	20%	40%	45%	45%
4	★★★★	15%	15%	20%	35%
Total		100%	100%	100%	100%

Based on the table above, it can be seen that there is an increase in learning outcomes in children when using smart tree media. We can see the increase in value in the following graph:

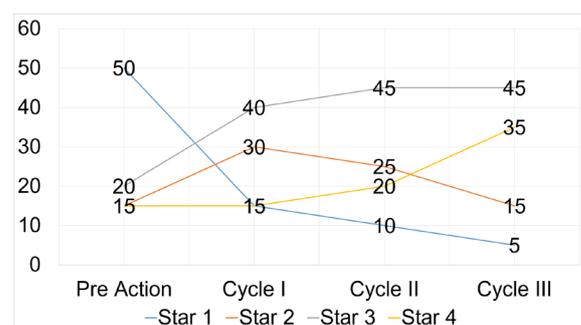


Figure 3. Improved children's learning outcomes from pre-action to cycle III

From the table above it can be seen that in the pre-cycle action of children who get 3 and 4 stars there are 7 children with a percentage (35%), the first cycle actions of children who get 3 and 4 stars are 14 children with a percentage (55%), the second cycle action of children 13 children who get 3 and 4 stars with a percentage (65%), the third cycle of children who get 3 and 4 stars is 16 children with a percentage (80%). From these data, it can be seen that the results of the ability to count 1-10 through smart tree media have increased gradually.

Discussion

Cycle I

In this first cycle, there is a very significant increase in children's learning outcomes. In the pre-action, the number of children who received 1 star was 10 children, while in the first cycle, the number of children who received 1 star was 3 children. However, for students who got 4 stars or the highest score was still the same, namely 3 children during the pre-action and cycle I. However, the number of students who got 2 and 3 stars has increased. This shows that 5 children who initially received 1 star (lowest score) increased to get 2 and 3 stars. According to Aziz (2017) the ability to count for early childhood is also referred to as the activity of mentioning a sequence of numbers or calling blind. The child mentions a sequence of numbers without connecting with concrete objects. At the age of 4, they can say the sequence from 1-10. Meanwhile, 5-6 years old can say the number up to one hundred.

According to Kessler et al. (2010) The ability to count is an ability possessed by every child. Every child can develop numeracy skills starting from simple things, such as counting from numbers 1-10 and so on. After developing cognitive abilities, the abilities of children will also develop accordingly. After entering the C2 (Understanding) stage, the child will begin to enter the realm of increasing and increasing. Based on these two definitions, the notion of numeracy ability is the ability possessed by each child in terms of mathematics such as the activity of sorting numbers or counting numbers to develop skills that are very necessary for everyday life, which is also the basis for developing mathematical abilities and readiness for education. basic for the child.

Cycle II

In this second cycle, there was another decrease in the number of children who got 1 star, namely to only 2 children. Meanwhile, children who earn 4 stars also increase to 4 children. Although not significant, this increase shows that learning in cycle

II is quite effective. But unfortunately, the number of children who get 2 stars is actually getting smaller, namely, in cycle II it is 6 down to 5 children. This makes researchers want to continue learning until cycle III. This is necessary to strengthen learning using smart tree media. So that this media can be a valid medium to improve students' numeracy skills. Simanjuntak & Siahaan (2018) explain the purpose of learning to count for early childhood aims to know the basics of learning to count so that in time the children will be better prepared to take part in learning to count at the next more complex level.

The efforts that must be made in developing numeracy skills are: (1) All efforts to develop early childhood are facilitated through game; (2) The implementation must be varied and fun; (3) In implementing learning, interesting media must be used. With game-based learning, children will participate more in the learning process carried out. This is also because children aged 1-5 are still playing on the stage. So that learning that is integrated in the game will be more effective. To make the game more specific, various learning media can be used so that the learning process is more interesting and less boring for children.

Media can be interpreted as an intermediary or messenger from the sender to the message recipient (Agustningsih, 2015). The media has an important role in achieving the goal of increasing numeracy skills in early childhood. The use of attractive media can develop preliminary numeracy skills (Wahyudhi, 2014). The ability to count can be improved with continuous training. For this reason, the use of instructional media will help the numeracy training process which is carried out continuously, making children not bored.

Cycle III

In cycle III students who get 1 star become only 1 child. Meanwhile, children who got 2 stars fell back to 3 children. The good news is that the number of children who get 4 stars has increased very rapidly, namely to 7 children. This shows a shift in the ability of children who were originally dominated by 2 stars to become 1 star. This is increasingly convincing that this medium can effectively improve children's numeracy skills. The use of instructional media is very necessary for relation to improving the quality of education. Lai et al. (2015) stated that the purpose of using media is that teaching will attract more students' attention so that it can lead to motivation, learning material will be clearer so that it is easy to understand. Print media Smart tree media is media that uses fruit image cards accompanied by the numbers 1-10, by taking number

cards and grouping them according to the numbers on the tree. The steps for using smart tree media are:

1. The teacher introduces the children to the use of smart tree media.
2. The teacher introduces the numbers 1-10 by taking a number card on the smart tree.
3. The teacher gives an example of how to group number cards on a smart tree.
4. The teacher appoints one of the children to name the numbers mentioned by the teacher.
5. The child pairs the number cards on the smart tree according to the teacher's instructions.

CONCLUSION

Based on the learning results for 3 cycles, it can be concluded that: (1) Smart tree learning media can improve children's numeracy skills effectively in An-Nur Labuapi Kindergarten; (2) Children at the Kindergarten level are more interested in learning that is operational and active (Kinesthetic); (3) Children's numeracy skills can be seen from the way the child mentions and sequences numbers.

Researchers also provide several suggestions, namely: (1) Teachers at the level of Early Childhood Education or Kindergarten should actively innovate in

using more operational learning media for students; (2) Parents can also start training children to do simple numeracy activities as an implementation of learning activities at school; (3) further research may be devoted to a deeper descriptive analysis of the effect of operational learning media on changes in children's numeracy skills; (4) The limitation of this study is that in-depth interviews with teachers are not conducted regarding the use of the media used. The results of the research are only results-oriented, not on the use of media from the teacher's point of view

REFERENCES

- Aguiar, A. L., Aguiar, C., Cadima, J., Correia, N., & Fialho, M. (2019). Classroom quality and children's social skills and problem behaviors: Dosage and disability status as moderators. *Early Childhood Research Quarterly, 49*, 81–92. DOI: 10.1016/j.ecresq.2019.05.005
- Agustiningsih, A. (2015). Video Sebagai Alternatif Media Pembelajaran Dalam Rangka Mendukung Keberhasilan Penerapan Kurikulum 2013 di Sekolah Dasar. *Pedagogia: Jurnal Pendidikan, 4* (1), 50. DOI: 10.21070/pedagogia.v4i1.72
- Ainon, M. & Yusrizal, N. U. (2017). Peningkatan Profesionalitas Guru Melalui. *Jurnal Administrasi Pendidikan Realita, 4* (2), 1–11. DOI: 10.1016/j.det.2012.08.002
- Astuti, S. D. (2016). Transmisi Budaya dan Kearifan Lokal pada Pendidikan Islam Anak Usia Dini. *Jurnal Penelitian, 3* (3), 1. DOI: 10.28918/jupe.v13i1.1190
- 'Aziz, H. (2017). Guru Sebagai Role Model Pendidikan Karakter Anak Usia Dini Perspektif Pendidikan Islam dan Ki Hajar Dewantara. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini, 4* (2), 43–56. DOI: 10.14421/jga.2016.12-01
- Bartholdsson, Å. (2020). "When there is a book to stick to": teacher professionalism and manual-based programmes in two Swedish early childhood education settings. *Education Inquiry, 14* (3), 1–18. DOI: 10.1080/20004508.2020.1725373
- Hidayati, V. R., Wulandari, N. P., Mauliyda, M. A., Erfan, M., & Rosyidah, A. N. K. (2020). Literasi Matematika Calon Guru Sekolah Dasar dalam Menyelesaikan Masalah PISA Konten Shape & Space. *JPMI: Jurnal Pembelajaran Matematika Inovatif, 3* (3), 1–10. DOI: 10.22460/jpmi.v3i3.p%25p
- Julianingsih, D. (2018). Upaya Meningkatkan Prestasi Belajar Siswa Matematika Melalui Strategi Pembelajaran Tutor Sebaya Dalam Penguasaan Bangun Datar Kelas VI SD Hidayatur Rohman Surabaya. *Edumatika : Jurnal Riset Pendidikan Matematika, 1*(1), 22–29. DOI: 10.32939/ejrpm.v1i1.219
- Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., Aguilar-Gaxiola, S., Alhamzawi, A. O., Alonso, J., Angermeyer, M., Benjet, C., Bromet, E., Chatterji, S., De Girolamo, G., Demyttenaere, K., Fayyad, J., Florescu, S., Gal, G., Gureje, O., ... Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *British Journal of Psychiatry, 13*(2), 345–357. DOI: 10.1192/bjp.bp.110.080499
- Lai, Y., Zhu, X., Chen, Y., & Li, Y. (2015). Effects of mathematics anxiety and mathematical metacognition on word problem solving in children with and without mathematical learning

- difficulties. *PLoS ONE*, 10(6), 1–19. DOI: 10.1371/journal.pone.0130570
- Mertler, C. A. (2017). Action Research: Improving Schools and Empowering Educators. In *Action Research: Improving Schools and Empowering Educators*. Berrett Koehler Inc. DOI: 10.4135/9781483396484
- Naidoo, P., & Petersen, N. (2016). Towards a leadership programme for primary school principals as instructional leaders. *South African Journal of Childhood Education*, 5(3), 334–339. DOI: 10.4102/sajce.v5i3.371
- Nurfahrudianto, A., Pd, S., Pd, M., Darsono, D., & Kom, M. (2017). The Impact Of Positive Coin And Negative Coin Game Media To Pupil Studing Result In Fourth Grade Students Second Semester To Matter Of Summing And Subtracting Integers Of Public Elementary School Karanganom I In Academic Year 2016/2017. *Jurnal SIMKI*, 01 (09), 1–10.
- Rosyidah, A. N. K., Mauliyda, M. A., & Oktaviyanti, I. (2020). Miskonsepsi Matematika Mahasiswa PGSD Pada Penyelesaian Operasi Hitung Bilangan Bulat. *Jurnal Ilmiah Kontekstual*, 2 (01), 15–21. DOI: 10.46772/kontekstual.v2i01.244
- Roza, D., Nurhafizah, N., & Yaswinda, Y. (2019). Urgensi Profesionalisme Guru Pendidikan Anak Usia Dini dalam Penyelenggaraan Perlindungan Anak. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 4(1), 277. DOI: 10.31004/obsesi.v4i1.325
- Simanjuntak, F., & Siahaan, H. (2018). Upaya Meningkatkan Kemampuan Berhitung Permulaan Menggunakan Bahan Alam. *Atfalunā: Journal of Islamic Early Childhood Education*, 1(2), 47–52. DOI: 10.32505/atfaluna.v1i2.921
- Simão, M. B., Gralik, C., Steinbech, F., & Rocha, E. A. C. (2014). “Prepare all that we play!”: Organizing spaces, enabling games and teaching experience in early childhood education stage. *Zero-a-Seis*, 16(9), 112. DOI: 10.5007/1980-4512.2014n29p112
- Visser, R., & Flynn, A. B. (2018). What are students’ learning and experiences in an online learning tool designed for cognitive and metacognitive skill development? *Collected Essays on Learning and Teaching*, 11(4), 350–367. DOI: 10.22329/celt.v11i0.5039
- Wahyudhi, J. (2014). VIDEO GAME SEBAGAI MEDIA PEMBELAJARAN SEJARAH (Suatu Alternatif dalam Menyelenggarakan Pembelajaran Sejarah). *SOSIO DIDAKTIKA: Social Science Education Journal*, 1(2), 13–22. DOI: 10.15408/sd.v1i2.1262
- Yazar Soyadı, M. L. (2015). Golden Age or Harmful Obsession Policy and Practice of Gifted and Talented Education in England 1997-2008. *Journal for the Education of Gifted Young Scientists*, 3(2), 51–51. DOI: 10.17478/JEGYS.2015214278
- Yusnia, D. (2018). Analysis The Ability of Students Problem-Solving on Counting Operations of Algebra Form. *MUST: Journal of Mathematics Education, Science and Technology*, 3(1), 1. DOI: 10.30651/must.v3i1.1017
- Zsolnai, A., & Kasik, L. (2014). Functioning of Social Skills from Middle Childhood to Early Adolescence in Hungary. *International Journal of Emotional Education*, 6(2), 54–68. DOI: 10.1093/nar/7.1.15