AL HIKMAH: INDONESIAN JOURNAL OF EARLY CHILDHOOD ISLAMIC EDUCATIO
ISSN (P): 2550-2200, ISSN (E): 2550-1100,
VOL. 8 (2), 2024, PP. 447 – 455
https://journal.uaindonesia.ac.id/index.php/ijecie

# The Effectiveness of Interactive Media Brainsmart Games at Logical Thinking Ability of Children Age

**Mohammad Tsaqibul Fikri**[1]✉, **Nadya Najma Soraya**[2]
[1 2] Universitas Nahdlatul Ulama Sunan Giri, Bojonegoro, Indonesia

**ARTICLE INFO**

*Article history:*
*Received October 05, 2024*
*Revised October 15, 2024*
*Accepted November 25, 2024*
*Available online December 31, 2024*

**Keywords:**
Interactive Media; brainsmart games; Logical Thinking.

This work is licensed under a Creative Commons Attribution 4.0 International License.

Copyright © 2024 by Author. Published by Universitas Al-Hikmah Indonesia.

**ABSTRACT**

The aim of this study is to identify the impact of using the interactive media Brainsmart Games on the logical thinking abilities of children aged 5-6 years. Brainsmart Games is an interactive medium specifically designed to develop the logical thinking abilities of children aged 5-6 years. Combining fun games with cognitive education principles, Brainsmart Games offers activities that stimulate critical thinking and logic through challenges tailored to the developmental stage of children. This study employs a Pre-Experimental Designs approach. The research design used in this study is the One Group Pretest-Posttest Design. This journal is the result of experimental research with a pre-experimental design involving two variables: the independent variable and the dependent variable. The independent variable is the interactive media Brainsmart Games, while the dependent variable is the logical thinking ability of children aged 5-6 years. Data collection was conducted using observation, documentation, and tests. Data analysis techniques included validity tests, normality tests, and hypothesis tests to determine whether there was a difference in the measurement results of children's logical thinking abilities. Based on the research conducted, the results are as follows: (1) The use of the interactive media Brainsmart Games can improve the logical thinking abilities of children aged 5-6 years. (2) The interactive media Brainsmart Games is effective in enhancing the logical thinking abilities of children aged 5-6 years. The results of the study and data analysis show that the average Pre-Test score of 13.45 is lower than the average Post-Test score of 19.75

## INTRODUCTION

Currently, learning in schools has used various learning aids such as methods, models, and various learning media. The use of these learning aids is made in line with the development of the existing era. The aids used in learning are starting to vary. One of them is interactive media. Interactive media is claimed to be able to help learning in the classroom become more conducive and able to build student activity in learning. Interactive media helps students understand concepts, increases student activity, increases students' critical thinking skills, increases interest, motivation, and enjoyment in learning and improves students' learning outcomes.

Based on the Program for International Study Assessment (PISA), it shows that the quality of Indonesian education has decreased in all indicators in the last few years and has placed Indonesia in the bottom 10 positions of 79 countries were studied in terms of achieving educational quality. (Susanti, 2020) Therefore, one important effort that can be

implemented is to prioritize. At an early age, children are in a stage of rapid cognitive development, so proper stimulation can help them hone their logical thinking skills from an early age. (Ma'arif & Ummah, 2023) The ability to think logically allows children to understand basic concepts, recognize patterns, and solve simple problems in a systematic way. (Nurul Maulida, n.t.).

Logical thinking abilities can be improved through interesting activities, through interactive and fun learning media, children can be trained to develop logical thinking abilities, such as grouping, sorting and connecting concepts. (Rupnidah & Suryana, 2022) For this reason, by implementing the use of appropriate learning media, children's logical thinking abilities can develop optimally. Jean Piaget, one of the leading figures in the field of developmental psychology, emphasized the importance of direct and interactive experiences for children in the learning process (Novitasari, 2024).

Previous research related to this title is about developing an interactive media called "Explosion Box" to enhance the logical thinking abilities of early childhood. The results of the study showed that the use of this interactive media could increase children's curiosity, thereby fostering the development of their logical thinking skills (Wijayanti, Utomo, Wiranata, & Lestaringrum, 2023).

The gap in the study titled *"The Effectiveness of Interactive Media Brainsmart Games at Logical Thinking Ability of Children Age"* lies in the limited research exploring the specific impact of Brainsmart Games on children's logical thinking abilities compared to other interactive media. While previous studies have examined general cognitive development or other skills like problem-solving and numeracy using various tools, few have focused explicitly on logical thinking in children aged 5-6 years. Additionally, the unique features and targeted approach of Brainsmart Games remain underexplored, especially within the context of pre-experimental designs like the one-group pretest-posttest design. This highlights a need for more in-depth analysis of how Brainsmart Games can contribute uniquely to cognitive development in early childhood education.

At this stage of development, children learn actively through exploration and experimentation to build thei r understanding of the world around them. (Chandra, 2012) In line with Jean Piaget, the multimedia learning theory developed by Richard E. Mayer emphasizes the importance of using learning media that uses multimedia to help children visualize complex logical concepts, making it easier for them to process and integrate information. (Balaka, 2022) In this way, the use of interesting media is seen as an effective solution in improving the logical thinking abilities of young children.

## METHODS

The type of research with a Pre-Experimental Designs approach. The research design used in this research is one group pretest-posttest design. The quantitative research is research based on the philosophy of positivism to examine certain populations or samples that are randomly selected with a data collection process using research instruments, while data analysis is carried out using statistical methods. (Bonate, 2000) Researchers used sample data from all class B students at, totaling 20 students.

The test technique used in this research is by creating initial test questions (pretest) and final test (posttest) with the aim of knowing student learning outcomes. The pretest is used to determine students' initial knowledge before being given treatment. Posttests were used by researchers for both groups to determine student learning outcomes after being given treatment. (Muhson, 2006).

In quantitative research, data analysis activities are carried out after all the data has been collected. The steps taken in data analysis include: grouping data based on the variables studied for each respondent, presenting data for each variable in a form that is easy to understand (such as tables or graphs), and carrying out statistical calculations to test research hypotheses. (Saputra & Permata, 2018).

## RESULT

### 1.1 Media Validation Test

Validation is an action that aims to evaluate and provide input on media information developed by researchers. The media expert validator is Endang Puspitasari M.Pd. The media expert validation process is carried out once. Validation results from the validator include:

**Table 1.** Data from media validation results

| No. | Assessment criteria | Criterion Value | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| | | STS | TS | S | SS |
| 1. | Brainsmart games media is effective for improving children's logical thinking abilities | | | | ✓ |
| 2 | Attractive and aesthetic game design to support learning goals and experiences | | | | ✓ |
| 3 | Brainsmart games media provides challenges that are appropriate to the child's abilities and age | | | | ✓ |
| 4 | Media Brainsmart games are in accordance with media functions | | | | ✓ |
| 5 | Brainsmart games media can be used anywhere and anytime | | | ✓ | |
| 6 | The level of interactivity and user involvement provides an appropriate challenge and encourages children's logical thinking | | | | ✓ |
| 7 | Appropriate content in games is age appropriate | | | | ✓ |
| 8 | The level of ease in completing the game is in accordance with the child's abilities | | | | ✓ |
| 9 | The attractive quality of the Brainsmart games media is interesting, not monotonous and not boring | | | ✓ | |
| 10 | Suitability of Brainsmart games media according to children's characteristics | | | | ✓ |
| | Amount | | | 38 | |

$$NP = \frac{R}{SM} \times 100\% \qquad NP = \frac{36}{40} \times 100\% = 80\%$$

Information:

NP = Percentage Value
R = Scores from respondents
SM = Maximum score of the test

Based on the calculation results in table 1, the percentage reaches 80% and is included in the "very feasible" category. However, there are still several inputs and recommendations that need to be made regarding the validation assessment of the media that has been developed. The researcher then revised it according to the validator's suggestions. After the revision was complete, the brainsmart games interactive media product was declared suitable for use with minor revisions.

## 1. Normality Test

In this study is a parametric statistical test. This normality test is important to determine the most appropriate and valid type of statistical analysis for the data obtained. Normality test calculation results for data before the test, using the Shapiro Wilk test with a sig level. 0.05. This test uses the help of the SPSS program. The results of the normality test calculation for the data before the test are as follows:

**Table 2.** Normality Test Results

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | Df | Sig. |
| PRETEST | .213 | 20 | .018 | .920 | 20 | .099 |
| POST TEST | .232 | 20 | .006 | .929 | 20 | .147 |

a. Lilliefors Significance Correction

Thus, it can be concluded that the data collected from both measurement stages, both before (pretest) and after (posttest) the intervention, were distributed normally. This assumption supports the use of parametric statistical tests in further data analysis to evaluate intervention effects or differences between the two measurement stages.

In the table above, the significance value (sig.) pre-test is 0.099, post-test value is 0.147. The pretest significance (sig.) value which is more than 0.05 (0.099 > 0.05) and the posttest significance value (sig.) which is also more than 0.05 (0.147 > 0.05). Thus, it can be concluded that the data collected from the pre-test and post-test fulfill the normal distribution assumption.

## 2. Hyphothesis Testing

Previous research questions were still conjectural, and the goal of hypothesis testing was to find the answer. The research hypothesis in this study is divided into 2, namely the null hypothesis (H0) and the alternative hypothesis (Ha), as follows:

1. Ho: There is no increase in logical thinking abilities through interactive brainsmart games media
2. Ha: There is an increase in the ability to think logically through the interactive media brainsmart games

In this research, the paired sample t-test is used to test whether the independent variable has a significant influence on the dependent variable. The calculation of the paired sample T-test was carried out in this research with the help of the SPSS program. The results of the paired sample T-test are as follows:

**Table 3.** Hypothesis Test Results

| 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 | -6.30000 | 1.45458 | .32525 | -6.98076 | -5.61924 | -19.370 | 19 | .000 |

According to the results of the data analysis above, the media feasibility test with media expert validation meets the expected criteria with assessment standards using a Likert scale using a 4 scale assessment category. The scores from the assessment results are then added up so that the total can be determined using a percentage value by dividing the score obtained by the maximum score and then multiplying by 100%. Based on the brainsmart games media validation results, it shows that this product received a percentage score of 80%, which indicates that the media is included in the "very suitable" category for use.

For the pretest data is 0.099 and for the posttest data is 0.147, both of which are greater than the 0.05 significance level. This shows that the data at both measurement stages, both pretest and posttest, are normally distributed. In other words, the data collected meets the normal distribution assumptions required.

The use of learning media that combines animation elements can help students better understand the concepts of the material being taught. S. Hadi stated that students will understand the concepts better if the material taught is combined with graphics, animation and video. It can be an effective means of conveying lesson material to students. Onintra states that interactive media is learning media that are designed interactively. (Widayat et al., 2014)

In addition, the theory of cognitive development according to Jean Piaget, emphasizes the importance of direct and interactive experiences for children in the learning process. At this stage of development, children learn actively through exploration and experimentation to build their understanding of the world around them. (Hartoto, 2020)

In line with Jean Piaget, the multimedia learning theory developed by Richard E. Mayer emphasizes the importance of using learning media that uses multimedia to help children visualize complex logical concepts, making it easier for them to process and integrate information. (Chandra, 2012) In this way, the use of interesting media is seen as an effective solution in improving the logical thinking abilities of young children.

## DISCUSSION

According with media expert validation meets the expected criteria with assessment standards using a Likert scale using 4 scale assessment category. The scores from the assessment results are then added up so that the total can be determined using a percentage value by dividing the score obtained by the maximum score and then multiplying by 100%. Based on the brainsmart games media validation results, it shows that this product received a percentage score of 80%, which indicates that the media is included in the "very suitable" category for use.

The significance value (sig.) for the pretest data is 0.099 and for the posttest data is 0.147, both of which are greater than the 0.05 significance level. This shows that the data at both measurement stages, both pretest and posttest, are normally distributed. In other words, the data collected meets the normal distribution assumptions required. This shows that there is an increase in ability think logically through interactive media brainsmart games.

The use of learning media that combines animation elements can help students better understand the concepts of the material being taught. S. Hadi stated that students will understand the concepts better if the material taught is combined with graphics, animation and video. The use of interactive media in learning can be an effective means of conveying lesson material to students.

In addition, the theory of cognitive development according to Jean Piaget, emphasizes the importance of direct and interactive experiences for children in the learning process. At this stage of development, children learn actively through exploration and experimentation to build their understanding of the world around them.

In line with Jean Piaget, the multimedia learning theory developed by Richard E. Mayer emphasizes the importance of using learning media that uses multimedia to help children visualize complex logical concepts, easier for them to process and integrate. In this way, the use of interesting media is seen as an effective solution in improving the logical thinking abilities of young children.

## CONCLUSION

Data analysis show that Brainsmart Games, interactive media, improve the logical thinking abilities of children aged. This is based on an average pretest score of 13.45 and an average posttest score of 19.75. From the increase at Brainsmart Games the logical thinking abilities. The Brainsmart Games as a learning aid makes a significant contribution to the

development of children's logical thinking abilities. Implementing interactive media such as Brainsmart Games in the classroom or at home can be an effective strategy to support early childhood learning.

## DECLARATIONS

We would like to thank all parties who have helped our research to completion. There are many shortcomings in this research in the theme of logical thinking. Hopefully it will become additional reference material for teachers or academics regarding aspects of critical reasoning for early childhood.

## BIBLIOGRAPHY

Apipah, Nor. "Pentingnya Penggunaan Media Dalam Pembelajaran Di Era Teknologi," n.d., 1–13.

Ayuni, Yasmin Reza Putri dkk. "Pengembangan Buku Panduan Konsep Pola Untuk Meningkatkan Kemampuan Berpikir Logis Anak Usia 5-6 Tahun" 3, no. 2 (2022): 157.

Bassham, Gregory, William Irwin, Henry Nardone, and James M Wallace. Critical Thinking: A Student's Introduction. McGraw-Hill, 2010.

Bloom, Nicholas, and John Van Reenen. "Efektifitas Organisasi." NBER Working Papers, 2013, 89. http://www.nber.org/papers/w16019.

Chandra, Francisca H. "Teknologi Informasi Dan Pedagogy : Penerapan Teori Pembelajaran Multimedia d Alam Pengembangan Media Pembelajaran Berbasis Program Microsoft" 5, no. 1 (2012): 22–30.

Dewantara, Hendi, and Ismaniar Ismaniar. "Logical Thinking Improvement in Children Aged 5 to 6 Years Through Pop-Up Book." SPEKTRUM: Jurnal Pendidikan Luar Sekolah (PLS) 9, no. 3 (2021): 384. https://doi.org/10.24036/spektrumpls.v9i3.113718.

Fachrurrazi, Ahmad, and Titah Kinasih. "Pelatihan Media Interaktif Untuk Pembelajaran" II, no. 1 (2022): 186–94.

Fikri, Mohammad Tsaqibul, Siti Labiba Kusna, and Mufidatul Choiriyah. "Pengembangan Media Pembelajaran Think Table Untuk Meningkatkan Kemampuan Berpikir Logis Table" 6, no. 2 (2023): 682–88.

Ganda, Ruqiah, Putri Panjaitan, and Neuwidia Nuzul Putri. "Multimedia Interaktif Berbasis Game Edukasi Sebagai Media Pembelajaran Materi Sistem Pernapasan" 8 (2020): 141–51. https://doi.org/10.24815/jpsi.v8i1.16062.

Hajar, S, and H T Widiastuti. "Pengawasan Penggunaan Gadget Bagi Anak Usia Dini." J-MAS: Jurnal Pengabdian Masyarakat 6384 (2022): 113–30. https://melatijournal.com/index.php/jmas/article/view/39.

Hardiyana, Andri. "Reurgenisasi Pendidikan Anak Usia Dini Di Era Globalisasi," n.d., 1–14.

Hartoto. "Teori Belajar Yang Melandasi Pengembangan Multimedia Pembelajaran Interaktif," 2020.

Hidayanto, Nur. "Pengembangan Media Interaktif…, Nur Hidayanto, FKIP, UMP, 2017," no. 2012 (2013): 6–20.

Karimah, L. S., Rollie C. Deporos, S. ., Kustiawan, U. ., & Twinsari Maningtyas, D. . (2022).

Does TikTok Effective in Stimulating Language Development for Children Aged 5-6?. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, *7*(1), 11–22. https://doi.org/10.14421/jga.2022.71-02

Ma'arif, Nina Nuriyah, and Fifi Mazroatul Ummah. "Menumbuhkan Kemampuan Berpikir Logis Anak Usia Dini: Studi Pengembangan Media Permainan Snakes and Ladders Di Tk Oxford Puri School Pps Manyar Gresik." Journal of Early Childhood Islamic Education 10 (2023): 129–42. http://jurnal.staidagresik.ac.id/index.php/atthiflah/article/view/318/223.

Media, Pengaruh, Pembelajaran Interaktif, Macbo Berbasis, Terhadap Kemampuan, Kognitif Anak, and Usia Tahun. "Jurnal Pendidikan Dan Konseling" 4 (2022): 12423–32.

Monika, Sella, Warananingtyas Palupi, and Shofiatin Zuhro. "Jurnal Kumara Cendekia Https://Jurnal.Uns.Ac.Id/Kumara Profil Kemampuan Berikir Logis Anak Usia 5-6 Tahun" 11, no. 1 (2023): 2023. https://jurnal.uns.ac.id/kumara.

Mulyani, Novi. Perkembangan Dasar Anak Usia Dini. 1st ed. Yogyakarta: Gava Media, 2018.

Nilawati, Riswan, and Lyly Oktavia. "Media Pembelajaran Interaktif." Jurnal Akademika 15, no. 1 (2022):70–75. https://doi.org/10.53564/akademika.v15i1.845.

Nisa', Luthfatun. "Pemanfaatan Teknologi Dalam Pendidikan Anak Usia Dini."

Nur, Hidayanto. "Pengembangan Media Interaktif," no. 1971 (1987): 11–29. Nurul Maulida, Annisa. "Penggunaan Media Pembelajaran," no. 1 (n.d.).

Novitasari, N. (2024). Pelaksanaan Program Home Visit Di Tk Islam Terpadu Al Uswah Jatirogo. *WISDOM: Jurnal Pendidikan Anak Usia Dini*, *5*(1), 1–14. https://doi.org/10.21154/wisdom.v5i1.7273

Oktafia, Dinda Puput, Noor Yunida Triana, and Roro Lintang Suryani. "Durasi Penggunaan Gadget Terhadap Interaksi Sosial Pada Anak Usia PraSekolah." Jurnal Kesehatan 4, no. 1 (2021): 31–47.

Rahmat, Stephanus Turibius, and Teknologi Pembelajaran Instructional Techno-. "Pemanfaatan Multimedia Interaktif Berbasis Komputer Dalam Pembelajaran," no. 10 (1994): 196–208.

Rizal, Soni Samsu, and Saepul Millah. "Konsep Perkembangan Kognitif Anak Usia Dini Dalam Buku Perkembangan Karya Jhon W. Santrock." Hanief: Jurnal Pendidikan Islam 1, no. 1 (2023).

Rozana, Salma, Dwi Septia Anjas Wulan, and Rini Hayati. Pengembangan Kognitif Anak Usia Dini (Teori Dan Praktik). Edited by Rikha Surtika Dewi. Tasikmalaya: Edu Publisher, 2020.

Rozi, Fathor, and Tsania Ikrimah. "Penggunaan Media Fruit Cartoon Card Dalam Meningkatkan Kemampuan Kognitif Anak" 7, no. 1 (2023): 62–71.

Rupnidah, R, and Dadan Suryana. "Media Pembelajaran Anak Usia Dini" 6, no. 1 (2022): 49–58.

Salis Hijriyani, Yuli, and Ria Astuti. "Penggunaan Gadget Pada Anak Usia Dini Dalam Menghadapi Era Revolusi Industri 4.0." ThufuLA: Jurnal Inovasi Pendidikan Guru Raudhatul Athfal 8, no. 1 (2020): 015. https://doi.org/10.21043/thufula.v8i1.6636.

Sanaky, Musrifah Mardiani. "Analisis Faktor-Faktor Keterlambatan Pada Proyek

Pembangunan Gedung Asrama Man 1 Tulehu Maluku Tengah." Jurnal Simetrik 11, no. 1 (2021): 432–39. https://doi.org/10.31959/js.v11i1.615.

Saputra, Very Hendra, and Permata Permata. "Media Pembelajaran Interaktif Menggunakan Macromedia Flash Pada Materi Bangun Ruang." WACANA AKADEMIKA: Majalah Ilmiah Kependidikan 2, no. 2 (2018): 116–25.

Sulaiman, Umar, Nur Ardianti, Jurusan Pendidikan, Islam Anak, Usia Dini, Jurusan Pendidikan, Islam Anak, Usia Dini, Anak Usia Dini, and Standar Nasional Pendidikan. "Tingkat Pencapaian Aspek Perkembangan Anak Usia 5-6 Tahun" 2 (2019): 52–65.

Susanti, Septiani Selly. "Pemanfaatan Teknologi Dalam Pendidikan Anak Usia Dini STAI Darussalam Lampung." Azzahra 2, no. 1 (2020): 65–75. https://databoks.katadata.co.id/datapublish/2016/08/08/pengguna-.

Widayat, Widi, Kasmui, and Sri Sukaesih. "Pengembangan Multimedia Interaktif Sebagai Media Pembelajaran Ipa Terpadu Pada Tema Sistem Gerak Pada Manusia." Unnes Science Education Journal 3, no. 2 (2014): 535–41.

Wijayanti, Findi Dwi, Anik Lestariningrum, and Ayu Titis Rukmana Sari. "Pengembangan Media Pembelajaran Explosion Box Pada Anak Usia 5-6 Tahun Guna Meningkatkan Kemampuan Kognitif Berpikir Logis." JECIE (Journal of Early Childhood and Inclusive Education) 6, no. 1 (2022): 40–45. https://doi.org/10.31537/jecie.v6i1.714.Novitasari, N. (2024). Pelaksanaan Program Home Visit Di Tk Islam Terpadu Al Uswah Jatirogo. *WISDOM: Jurnal Pendidikan Anak Usia Dini*, *5*(1), 1–14. https://doi.org/10.21154/wisdom.v5i1.7273

Wijayanti, F. D., Utomo, H. B., Wiranata, I. H., & Lestaringrum, A. (2023). *EXPLOSION BOX: MEDIA INTERAKTIF GUNA MENINGKATKAN KEMAMPUAN BERPIKIR LOGIS ANAK USIA DINI*. *3*(1), 29–38.