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# Flashcard Media Innovation in Thematic Science Lessons Growth and Development of Living Creatures in Elementary Schools

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***ABSTRAK***

*Sulitnya materi yang tersaji dalam mata pelajaran IPA serta kurangnya kemampuan guru dalam memanfaatkan penggunaan media pembelajaran berdampak pada rendahnya kemampuan siswa dalam memahami materi pembelajaran. Sehingga tujuan dari penelitian ini adalah untuk mengembangkan media* flashcard *pada materi pertumbuhan dan perkembangan makhluk di sekolah dasar agar peserta didik lebih mudah memahami materi yang diajarkan. Desain penelitian yang digunakan adalah penelitian dan pengembangan atau* research and development (R&D) *yang melalui 7 tahapan desain pengembangan menurut Borg & Gall. Teknik pengumpulan data yang dilakukan dalam penelitian ini adalah wawancara, observasi, dan angket. Teknik analisis data menggunakan deskriptif kuantitatif. Hasil dari penelitian dan pengembangan ini menunjukkan bahwa media pembelajaran* flashcard *materi pertumbuhan dan perkembangan makhluk hidup untuk membekali keterampilan berbicara siswa dinyatakan layak digunakan. Hal ini dapat dilihat dari hasil validasi materi dengan rata-rata skor 4,8 yang termasuk kategori "sangat baik" dan validasi media dengan rata-rata skor 3,95 kategori "baik". Selain itu, hasil respon siswa pada uji coba lapangan awal mendapatkan rata-rata skor 4,6 yang termasuk kategori "sangat baik" dan hasil respon guru mendapatkan rata-rata skor 4,7 yang termasuk kategori "sangat baik" serta hasil respon siswa pada uji coba lapangan utama mendapatkan rata-rata skor 4,49 yang termasuk kategori "sangat baik". Dengan ini dapat disimpulkan media pembelajaran* flashcard *ini layak digunakan dalam proses pembelajaran di kelas III sekolah dasar.*

**ABSTRACT**

The difficulty of the material presented in science subjects and the teacher's lack of ability to utilize learning media have an impact on students' low ability to understand learning material. So, the aim of this research is to develop flashcard media on the growth and development of creatures in elementary schools so that students can more easily understand the material being taught. The research design used is research and development (R&D) which goes through 7 stages of development design according to Borg & Gall. The data collection techniques used in this research were interviews, observation and questionnaires. The data analysis technique uses quantitative descriptive. The results of this research and development show that the flashcard learning media regarding the growth and development of living things to equip students' speaking skills is declared suitable for use. This can be seen from the results of material validation with an average score of 4.8 which is in the "very good" category and media validation with an average score of 3.95 in the "good" category. Apart from that, the results of student responses in the initial field trial got an average score of 4.6 which was included in the "very good" category and the results of teacher responses got an average score of 4.7 which was included in the "very good" category as well as the results of student responses in the main field trial got an average score of 4.49 which is in the "very good" category. With this, it can be concluded that this flashcard learning media is suitable for use in the learning process in class III of elementary school.

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## 1. INTRODUCTION

Natural sciences are a group of sciences that have special characteristics, namely studying factual natural phenomena in the form of reality, or events and their cause-and-effect relationships (Mulyasari et al., 2022; Nurdahri, 2020; Suparman et al., 2020). It is further explained that science is a science that was initially obtained and developed based on experiments, but in subsequent developments science was also obtained and developed based on theory (Nuryani & Abadi, 2021; Suparman et al., 2020).The learning material presented in science subjects can help students to think logically about everyday events and increase intellectual development, so that science can be viewed in terms of products, processes and in terms of attitude development (Risky, 2019; Sugiarti & Handayani, 2017). In the process of implementing science learning, it will be easier to understand if it is taught using learning media, where media innovation in the science learning process will be able to help teachers expand learning material (Nurjanah, 2022; Sapitri et al., 2022). The use of media in the learning process will be able to stimulate students to think critically, use their imagination abilities, and stimulate students' creativity (Dwiana et al., 2021; Pangestu & Kurniawati, 2019; Wijaya, 2023).

However, the reality on the ground shows that the application of media in the science learning process is still relatively low (Adawiyah, 2021; Fazariyah & Dewi, 2020; Harlina & Yusuf, 2020; Wardhani & Krisnani, 2020).This is supported by the results of observations and interviews conducted on class III students in four areas in Yogyakarta, namely MI YAPPI Doga which is in Gunung Kidul, SD N Kasihan which is in Kulon Progo, SD N Demangan which is in Yogyakarta, and SD N Jongkang show that in the learning process teachers rarely use learning media so that students find it difficult to learn the learning material presented. In carrying out the science learning process, teachers only rely on pictures in students' books, which they feel are less effective in conveying the material so that it is truly understood by students. Apart from that, there are only a few examples of the growth of living things in student books and when students read the material, students only actively memorize but cannot involve students actively in thinking and communicating what they have learned. The students felt less interested because the media used were only pictures that were already in the book and there was a lack of student involvement in this material. Furthermore, the results of observations and interviews also show that in the learning process students only act as listeners to the material presented by the teacher so that most students feel bored when the learning process takes place. This problem then has an impact on the low science learning outcomes of class III students, which also results in the learning objectives not being achieved properly.

One effort that can be made to overcome this problem is to maximize the use of learning media, such as flashcard learning media (Fitriyana et al., 2020; Mawardah et al., 2023). Flashcard media is a form of educational learning media that is presented by containing various images and writing (Munthe & Sitinjak, 2019; Suratimah & Dwijayanti, 2023). Images or writing presented in flashcard media generally contain a series of messages with various information presented below (Aprilya, 2023; Winangun, 2020).Images and writing presented in flashcard media will be able to generate curiosity in students regarding the information presented (Kusumawati & Mutiasari, 2023; Rahman et al., 2021). Flashcard media has several advantages, such as being able to develop memory, train independence, and increase the amount of vocabulary, effective and efficient for use in the learning process, and useful (Nurhasanah, 2021; Wiweka et al., 2021).

Several previous studies have revealed that the flashcard media in my hero material can significantly improve the learning outcomes of fourth grade elementary school students (Shafa et al., 2022). The results of other research reveal that interactive multimedia-based flash cards are effectively used to introduce English vocabulary to young children (Susantini & Kristiantari, 2021). The results of further research also revealed that flashcard media is very suitable for improving students' English language skills (Saputri, 2020). So based on the results of this research, it can be seen that flashcard media is able to have a positive influence on improving student learning outcomes. It's just that in previous research, there have been no studies that specifically discuss the innovation of flashcard media in thematic science lessons on the growth and development of living things in elementary schools. So, this research is focused on this study with the aim of developing flashcard media on material on the growth and development of creatures in elementary schools so that students can more easily understand the material being taught.

## 2. METHOD

The type of research used is research and development (R&D) which goes through 7 stages of the 10 stages of design development according to Borg & Gall. The stages passed in this research were data collection, planning, initial product development, initial field trials, product revision, main field trials, and

product refinement resulting from field trials. The subjects involved in this research were 3 students for the initial field trial and 10 students for the main field trial.

Data collection in the research was carried out using observation, interviews and distributing questionnaires. The instruments in this research are material expert validation questionnaire, media expert validation questionnaire, student response questionnaire, teacher response questionnaire. The data obtained from this research is divided into two, namely quantitative data and qualitative data. Quantitative data was obtained from material validation, media validation, student response questionnaires, teacher response questionnaires. Qualitative data was obtained from interviews, observations and questionnaires as well as comments or criticism provided by media experts and material experts. The research instrument grid can be seen in Table 1, Table 2, Table 3, and Table 4.

**Table 1**. Material Expert Instrument Grid

| No. | Aspect | Indicator | No. Item | Number of Items |
|---|---|---|---|---|
| 1 | Appropriateness material/content | Conformity of material with KI and KD | 1, 2 | 2 |
| | | Material completeness | 3, 4 | 2 |
| | | Clarity of material | 5, 6 | 2 |
| | | Suitability of material to student characteristics | 7 | 1 |
| 2 | Appropriateness Language | EYD suitability | 8 | 1 |
| | | Improved language skills | 9 | 1 |
| 3 | Media | Clarity and ease of use of media | 10, 11 | 2 |
| | | Student interactivity with media | 12 | 1 |
| | | Media appeal | 13 | 1 |
| | | Meaningfulness of material | 14, 15 | 2 |
| **Amount** | | | | **15** |

**Table 2**. Media Expert Instrument Grid

| No. | Aspect | Indicator | No. Item | Amount Item |
|---|---|---|---|---|
| 1 | Appropriateness Material/Content | Clarity of material | 1 | 1 |
| | | Suitability of image to material | 2 | 1 |
| 2 | Media | Clarity and ease of use of media | 3, 4 | 2 |
| | | Media appeal | 5 | 1 |
| | | The attractiveness of images in the media | 6 | 1 |
| | | Writing readability | 7 | 1 |
| | | Use of color | 8 | 1 |
| | | Media meaningfulness | 9, 10 | 2 |
| **Amount** | | | | **10** |

**Table 3.** Teacher Response Instrument Grid

| No. | Aspect | Indicator | No. Item | Amount Item |
|---|---|---|---|---|
| 1 | Design media | Media appeal | 1, 2 | 2 |
| | | Use of images | 3, 4 | 2 |
| | | Use of color | 5, 6 | 2 |
| | | Use of letters | 7, 8, 9 | 3 |
| | | layouts | 10 | 1 |
| | | product packaging | 11 | 1 |
| 2 | Physique | Media materials | 12 | 1 |
| | | Media resilience and security | 13, 14 | 2 |
| | | Ease of use of media | 15, 16 | 2 |
| 3 | Component Support Media | Material suitability | 17 | 1 |
| | | Suitability of media to the age and level of development of students | 18, 19 | 2 |
| | | Instructions for using media | 20 | 1 |
| **Amount** | | | | **20** |

**Table 4.** Student Response Instrument Grid

| No. | Aspect | Indicator | No. Item | Amount Item |
|---|---|---|---|---|
| 1 | Suitability of material/content | Conformity of material with KI and KD | 1 | 1 |
| | | Material completeness | 2 | 1 |
| | | Suitability of material to student characteristics | 3 | 1 |
| 2 | Language eligibility | Improved language skills | 4 | 1 |
| 3 | Media | Clarity and ease of use of media | 5, 6 | 2 |
| | | Student interactivity with media | 7 | 1 |
| | | Material attractiveness | 8 | 1 |
| | | Meaningfulness of material | 9, 10 | 2 |
| **Amount** | | | | **10** |

The data obtained from media trial activities is divided into two, namely quantitative data and qualitative data. Quantitative data was obtained from material validation, media validation, teacher response questionnaires, student response questionnaires and the results of student speaking skills. Qualitative data was obtained from interviews, observations and questionnaires as well as comments or criticism provided by media experts and material experts. The conversion of quantitative data (average total score) into qualitative data can be seen in Table 5.

**Table 5**. Converting Quantitative Data into Qualitative Data

| Formula | Calculation | Classification |
|---|---|---|
| $X > \chi i + 1.8 \times sbi$ | $X > 4.2$ | Very good |
| $\chi i + 0.6 \times sbi < X \leq \chi i + 1.8 \times sbi$ | $3.4 < X \leq 4.2$ | Good |
| $\chi i - 0.6 \times sbi < X \leq \chi i + 0.6 \times sbi$ | $2.6 < X \leq 3.4$ | Enough |
| $\chi i - 0.6 \times sbi < X \leq \chi i - 0.6 \times sbi$ | $1.8 < X \leq 2.6$ | Not enough |
| $X \leq \chi i - 1.8 \times sbi$ | $X \leq 1.8$ | Very less |

## 3. RESULT AND DISCUSSION

### Result

The research begins by collecting initial data, then the researcher carries out planning, after that develops a product draft, continues with initial field trials, then revises the results of initial field trials, after revising continues with main field trials, and finally perfects the product resulting from field trials . The research results were obtained from the initial field trials and the main field trials, namely the results of student response data and teacher responses. The flashcard media for the growth and development of living things is validated by material expert validation and media expert validation. Material validation is carried out once or in one stage. The result of stage I is that the material developed is very good in terms of appropriateness of material, appropriateness of language and media so that there are no revision notes.

The results of the validation assessment by material experts obtained a total score of 72 with an average of 4.8. Based on the guidelines for converting quantitative to qualitative data, the level of validity and quality of flashcard media products for the growth and development of living things is included in category A or Very Good and can proceed to the media validation stage. Media validation is carried out twice or in two stages.

The results of the validation assessment by media experts obtained a total score of 74 with an average of 3.7. Based on the guidelines for converting quantitative data to qualitative, the level of validity and quality of flashcard media products for the growth and development of living things is included in category B or Good with revision notes in certain sections. After making improvements, the researcher carried out Phase II media validation. The results of the validation assessment by media experts obtained a total score of 79 with an average of 3.95. Based on the guidelines for converting quantitative data to qualitative, the level of validity and quality of flashcard media products for the growth and development of living things is included in category B or Good. Based on these results, this media is suitable for testing in the field without revision from media experts. After media validation is complete, it continues with initial field trials. The data obtained in this field trial were the results of student responses and teacher responses. The assessment results from the student response questionnaire obtained a total score of 46 with an average of 4.6. Based on these results, the flashcard media material on the growth and development of living things is included in category A or very good.

The assessment results from the teacher response questionnaire obtained a total score of 47 with an average of 4.7. Based on these results, the flashcard media material on the growth and development of living things is included in category A or Very Good. In the initial field trial, the results of the speaking skills of 3 students received an average score of 3.62which if categorized falls into the "very good" category. In the main field trial, the activities carried out are the same as those in the initial field trial stage. The only difference was that the response questionnaire was given only to students, because the teacher had stated that the media was suitable for use in the initial field test.

Based on the assessment results from the student response questionnaire in the main field trial, they received a total score of 44.9 with an average of 4.49 which is included in category A or very good. The results of students' speaking skills in the main field trial, totaling 10 people, received an average score of 3.52which if categorized falls into the "very good" category. This shows that the students' ability to speak is very good, but there are some that need to be trained further from the 6 existing aspects. It can be concluded from the data obtained that this flashcard media is suitable for use in the learning process regarding the growth and development of living things in class III elementary school to equip students' speaking skills. The visualization of the flashcard results from the development can be seen in Figure 1.


**Figure 1**. Visualization of Flashcards

**Discussion**

From the results of the research and development above, it was found that flashcard products in the category are suitable for use in the science learning process, especially in material on the growth and development of living things in elementary schools. These results then show that flashcard media can have a positive influence on improving student learning outcomes. This is of course related to the characteristics of the flashcard media which is presented by containing various images and text that are appropriate to the learning material. Flashcard media is a form of learning media that is presented in the form of small cards, the size of which is adjusted to the students' needs (Shafa et al., 2022; Susantini & Kristiantari, 2021).On flashcard media there are various images and writing that are related to each other and form a material concept (Gandana & Fauziah, 2023; Saputri, 2020).Images and writing presented in flashcard media will be able to generate curiosity in students regarding the information presented (Arsyaf et al., 2022; Hayati, 2022). Flashcard media has several advantages, such as being able to develop memory, train independence, and increase the amount of vocabulary, effective and efficient for use in the learning process, and useful (Nurhasanah, 2021; Wiweka et al., 2021).

Learning media presented in an image certainly really helps the success of the science learning process, this is because in science learning there are material concepts that are abstract, so media is needed to concretize these concepts (Nuryani & Abadi, 2021; Suparman et al., 2020). The material presented in science learning requires students to think logically about events and phenomena that occur in everyday life, with the aim of increasing intellectual development, so that science can be viewed in terms of products, processes and in terms of developing attitudes (Risky, 2019; Sugiarti & Handayani, 2017). In the process of implementing science learning, it will be easier to understand if it is taught using learning media, where media innovation in the science learning process will be able to help teachers expand learning material (Nurjanah, 2022; Sapitri et al., 2022).If learning media is designed and developed appropriately, learning will run more effectively and efficiently (Zahwa & Syafi'i, 2022).The results obtained in this study are in line with the results of previous research which also revealed that the flashcard media in my hero material was significantly able to improve the learning outcomes of fourth grade elementary school students (Shafa et al., 2022). The results of other research reveal that interactive multimedia-based flash cards are effectively used to introduce English vocabulary to young children (Susantini & Kristiantari, 2021). The results of further research also revealed that flashcard media is very suitable for improving students' English language skills (Saputri, 2020). So based on several research results, it can be seen that

## 4. CONCLUSION

Based on the results of the discussion above, it can be concluded that research which aims to develop learning media in the form of flashcards regarding the growth and development of living things in elementary schools is declared suitable for use for learning in schools. This is based on the results of research and development using Borg & Gall's theory development procedures. This research produces innovative development media products for learning in elementary schools. Flashcard media is able to have a positive influence on improving student learning outcomes.

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