

The Effect of Couple Card Learning Media on Students' Learning Outcomes in the Human Musculoskeletal System

Asri Ainun Wardani^{1*}, St. Syamsudduha¹, Syamsul¹

¹Alauddin State Islamic University of Makassar, Indonesia

*Correspondence email: syamsul.hamzah@uin-alauddin.ac.id

ABSTRACT

This study aimed to examine the effect of Couple Card learning media on the learning outcomes of eleventh-grade students at SMAN 13 Makassar in the topic of the human movement system. A quantitative approach was employed using a quasi-experimental method with a nonequivalent control group design. The study population consisted of 136 eleventh-grade students. The sample was selected through multistage random sampling, resulting in Class XI MIA 1 being assigned as the experimental group and Class XI MIA 2 as the control group. Each group comprised 15 students. Learning outcome data were collected using an achievement test and analyzed through descriptive and inferential statistical procedures. The inferential analysis included tests of normality, homogeneity of variance, and an independent-samples t-test. The results showed that the experimental group obtained a mean posttest score of 90.5, whereas the control group achieved a mean score of 84.4. The independent-samples t-test yielded a two-tailed significance value of 0.013, which was lower than the significance level of 0.05. These findings indicate a statistically significant difference in learning outcomes between the experimental and control groups. Therefore, the use of Couple Card learning media had a significant effect on students' learning outcomes in the topic of the human movement system and may be considered a viable alternative instructional medium in biology education.

ABSTRAK: Penelitian ini bertujuan menganalisis pengaruh penggunaan media pembelajaran *Couple Card* terhadap hasil belajar peserta didik kelas XI SMAN 13 Makassar pada materi sistem gerak manusia. Pendekatan yang digunakan adalah kuantitatif dengan metode kuasi eksperimen dan desain *nonequivalent control group*. Populasi penelitian terdiri atas 136 peserta didik kelas XI. Sampel dipilih melalui teknik *multistage random sampling*, sehingga kelas XI MIA 1 ditetapkan sebagai kelompok eksperimen dan kelas XI MIA 2 sebagai kelompok kontrol. Masing-masing kelompok beranggotakan 15 peserta didik. Data hasil belajar dikumpulkan melalui tes, kemudian dianalisis menggunakan statistik deskriptif dan inferensial. Analisis inferensial mencakup uji normalitas, uji homogenitas varians, serta *independent-samples t-test*. Hasil penelitian menunjukkan bahwa nilai rata-rata posttest kelompok eksperimen sebesar 90,5, sedangkan kelompok kontrol memperoleh rata-rata sebesar 84,4. Hasil *independent-samples t-test* menunjukkan nilai signifikansi dua arah sebesar 0,013, lebih kecil daripada taraf signifikansi 0,05. Temuan tersebut mengindikasikan adanya perbedaan hasil belajar yang signifikan antara kelompok eksperimen dan kelompok kontrol. Oleh karena itu, penggunaan media pembelajaran *Couple Card* terbukti berpengaruh signifikan terhadap hasil belajar peserta didik pada materi sistem gerak manusia dan dapat dipertimbangkan sebagai salah satu alternatif media dalam pembelajaran biologi.

Keywords: *couple card, learning outcomes, human movement system.*



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INTRODUCTION

The success of the learning process is influenced by several interrelated factors, including subject-matter content, instructional delivery, learners, educators, learning-environment facilities, and various instructional media designed to create engaging and enjoyable learning experiences (Shela & Mustika, 2023). The subject matter should be organized within the curriculum according to the spiral principle, enabling concepts to be revisited progressively at increasing levels of complexity (Muzayanah et al., 2025). Instructional content should also be delivered through direct skill demonstrations so that learners can more easily understand the procedures and stages being taught (Wang et al., 2024). Following the demonstration, learners should be given opportunities to practise under the supervision of an instructor and subsequently continue practising independently until they achieve the expected level of competence (Fuentes-Cimma et al., 2024). The selection of appropriate instructional media is equally important, as it can create a more relaxed, engaging, and accessible learning process for learners (Misan-Ruppee et al., 2024).

The limited use of instructional media in current school teaching and learning practices presents a particular challenge for educators. The availability of appropriate learning resources is essential for supporting the instructional process and constitutes an important component in facilitating effective learning activities (Shela & Mustika, 2023). In addition to functioning as instructional tools, learning media play a crucial role in communicating and delivering instructional content throughout the learning process. Picture-card media, particularly the Couple Card, facilitate students' understanding of subject matter in a detailed and systematic manner. This medium incorporates attractive, colorful images that encourage students to remain focused and enthusiastic, promote a participatory learning environment, and contribute to improved learning outcomes (Annaafi & Setiawan, 2025).

An observation conducted on September 5, 2023, at SMAN 13 Makassar revealed that classroom instruction remained predominantly teacher-centered. The teacher primarily delivered the learning materials using textbooks and PowerPoint presentations, resulting in a learning process that appeared monotonous and was less engaging for students. Furthermore, visual card-based learning media had not yet been implemented in the classroom.

One of the instructional media used to support the learning process is the couple card, a card-based medium consisting of two corresponding sides containing questions and answers. The question side presents images formulated as prompts related to the learning

material, whereas the answer side may contain images, written information, or explanations that correspond to the questions (Annaafi & Setiawan, 2025). Flash cards, meanwhile, are simple instructional media made of paper and typically contain images accompanied by supporting descriptions. The use of these learning media encourages students to participate more actively in classroom activities, thereby supporting the optimal achievement of learning objectives. The implementation of media such as couple cards and flash cards has been shown to contribute significantly to improving learning outcomes while simultaneously enhancing student engagement, as reflected in their active participation in discussions and responses to questions (Isnaeni & Prasetyaningtyas, 2024).

RESEARCH METHOD

A quasi-experimental approach with a nonequivalent control group design was adopted in this study. The research was carried out at SMAN 13 Makassar, Manggala District, South Sulawesi, Indonesia, involving a population of 136 eleventh-grade students. Multistage random sampling was used to select Class XI MIA 1 as the experimental group and Class XI MIA 2 as the control group, with 15 students participating in each group. Students in the experimental group were taught using Couple Card learning media, whereas those in the control group received instruction through flash cards. Learning achievement was assessed using a test instrument that had previously been examined for validity and reliability. The collected data were analyzed using descriptive and inferential statistical procedures. Tests of normality and homogeneity were conducted before hypothesis testing to verify that the required statistical assumptions were satisfied. Subsequently, an independent-samples t-test was performed to examine whether the two instructional media produced a statistically significant difference in students' learning achievement.

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics of the Pretest and Posttest Scores in the Experimental and Control Groups

Statistic	Eksperimental Group		Control Group	
	Pretest Score	Posttest Score	Pretest Score	Posttest Score
Maksimum	50	100	33	100
Minimum	16	83	11	77
Mean	29,7	90,5	25,2	84,4
Standard Deviation	8,44	5,9	6,79	8,43
Variance	5,82	3,4	4,46	4,49

The descriptive findings revealed improvements in learning outcomes in both the experimental and control groups after the respective instructional treatments. Prior to the

intervention, the experimental group taught through the Couple Card medium recorded an average score of 29.7, with individual scores ranging from 16 to 50. The distribution of the pretest scores was characterized by a standard deviation of 8.44 and a variance of 5.82. Following the implementation of Couple Card learning activities, the group's mean score rose markedly to 90.5. The posttest scores ranged between 83 and 100, with a standard deviation of 5.90 and a variance of 3.40. Meanwhile, students in the control group who learned through flash cards obtained a pretest mean of 25.2, with scores ranging from 11 to 33. Their initial scores produced a standard deviation of 6.79 and a variance of 4.46. After the instructional process, the control group's mean score increased to 84.4, while the posttest scores ranged from 77 to 100. The standard deviation and variance of the posttest scores were 8.43 and 4.49, respectively.

The analysis revealed that, before the Couple Card medium was introduced, 14 students in the experimental class, XI MIA 1, were categorized as having very low learning outcomes, while one student was placed in the low category. After the intervention, the distribution of scores changed considerably: 10 students attained the very high category, and the other five students reached the high category. This shift reflects a substantial improvement in student achievement from predominantly very low performance before the intervention to high and very high performance afterward. A similar upward trend was found in the control class, XI MIA 2. Prior to the use of the Flash Card medium, all students were categorized as having very low learning outcomes. Following the posttest, one student achieved the very high category, whereas the remaining 14 students were classified in the high category.

Before conducting the independent-samples t-test to compare the experimental and control groups, the dataset was first evaluated to confirm compliance with the relevant statistical assumptions. This preliminary evaluation included normality and homogeneity of variance tests. The normality test was performed to determine whether the pretest and posttest learning outcome data were normally distributed. The results of the normality analysis are presented in the following table.

Table 2. Results of the Normality Test for Students' Learning Outcomes

Group and Test	Shapiro-Wilk			Interpretation
	Statistic	Df	Sig.	
Eksperimental Group Pretest	0.943	15	0.424	Normally distributed
Eksperimental Group Posttest	0.854	15	0.099	
Control Group Pretest	0.887	15	0.062	
Control Group Posttest	0,091	15	0.097	

The Shapiro–Wilk analysis showed that the learning outcome scores of students in both the experimental and control groups followed a normal distribution. Accordingly, the normality requirement for conducting parametric statistical tests was satisfied.

Table 3. Homogeneity Test of Students' Learning Outcome Score

Levene Statistic	df1	df2	Sig.	Interpretation
0.616	3	56	0.114	Homogeneous variances

The homogeneity test yielded a significance value of 0.114, exceeding the specified alpha threshold of 0.05. This finding indicates that no statistically significant difference existed between the variances of the experimental and control groups. Therefore, the homogeneity of variance assumption was satisfied, allowing the subsequent inferential analysis to be conducted.

Table 4. Results of Hypothesis Testing for Students' Learning Outcomes

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	T	Df	Sig. (2-tailed)
Equal variances assumed	0.408	0.528	2.663	28	0.013
Equal variances not assumed			2.663	27.976	0.013

The results of the independent-samples t-test demonstrated a significant difference in posttest performance between the two groups, $t = 2.663$, $p = 0.013$. Since the probability value was below the 0.05 significance criterion, the null hypothesis was rejected, providing support for the alternative hypothesis. Students in the experimental group who learned through the Couple Card medium obtained a mean posttest score of 90.5, compared with a mean score of 84.4 among students in the control group who were taught using flashcards. This difference suggests that the Couple Card medium was more effective than flashcards in improving students' learning outcomes on the human movement system.

The results indicated that Grade XI MIA 1 students achieved a high level of learning performance in the human movement system topic following the implementation of Couple Card media, with a mean score of 90.5. The use of this medium appeared to create a more engaging and interactive learning environment, thereby encouraging students to participate more actively and maintain their motivation, enthusiasm, and attention during instruction.

The experimental group also attained a higher mean posttest score than the control group, suggesting that well-designed instructional media can strengthen conceptual understanding, enhance the effectiveness of classroom learning, and assist students in mastering the learning content. Couple Card media offers particular value through its concept-matching activities, which require students to identify relationships among ideas while participating in an enjoyable and interactive learning process (Maghfiratul & Fitriani, 2018).

In addition to promoting students' active involvement during the learning process, the couple card learning medium also strengthens collaboration among students as they work together to identify the prepared answers. Its implementation encourages students' creativity and increases their participation in reading, listening, and selecting the presented material, thereby fostering self-confidence and greater classroom engagement. This learning medium also helps students become more careful and attentive throughout the learning process (Puntari, 2021). Discussion-based activities direct students' attention toward specific questions, allowing them to examine the learning material more thoroughly and develop a deeper conceptual understanding. In addition, the use of Couple Cards supports the development of students' learning skills and overall academic performance.

The increase in the control group's learning outcomes may be associated with the use of flashcards as instructional media. These visual aids supported students in sustaining their attention and becoming more actively involved throughout the learning process (Aziza & Yulia, 2022). The use of instructional media that is appropriately matched to the learning objectives can also enhance the effectiveness and efficiency of instruction, potentially producing better outcomes than relying solely on conventional teaching approaches (Zainuddin et al., 2020).

Flashcard-based instructional media provide several pedagogical benefits, especially by creating a more enjoyable learning experience and strengthening students' interest in classroom activities (Zainuddin et al., 2020). Previous research has also indicated that flashcards can support learning efficiency by helping students maintain their concentration when engaging with written materials (Hsu & Lin, 2024). Their use may further enhance the overall learning process by encouraging students to become more actively involved in different instructional tasks (Çoban Sural & Yaşar Sağlık, 2024). By incorporating flashcards into classroom instruction, teachers can provide students with more opportunities to

participate in reading activities, interact with the presented content, and respond meaningfully to the learning materials.

The findings indicate that the use of Couple Card and flash card learning media contributed to classroom learning activities, although their effects were not statistically significant (Puntari, 2021). This may be attributed to the similar characteristics of the two media, as both are game-based and use cards as their primary components (Puntari, 2021). In addition to instructional media, students' learning outcomes are influenced by internal factors, including intelligence, physical condition, health, reading habits, attitudes, motivation, perseverance, interest, and attention, as well as external factors originating from the family and school environments (Hemmler & Ifenthaler, 2024).

Instructional media play an important role in determining the quality and effectiveness of teaching and learning activities in the classroom (Azhar & Wulandari, 2023). Students' learning achievement is strongly influenced by the learning experiences they encounter during the instructional process (Sailer & Homner, 2020). Therefore, teachers need to be capable of selecting and implementing media that align with the intended learning outcomes while also addressing the specific needs of their students (Aziza & Yulia, 2022). The effectiveness of instruction is further strengthened when appropriate learning models are employed, as these models can encourage students to participate more actively and engage more meaningfully in classroom activities (Zainuddin et al., 2020). Well-designed instructional media can also facilitate communication, collaboration, and interaction among students, thereby promoting greater involvement throughout the learning process (Nicholus et al., 2024).

Couple cards and flashcards can be used as instructional tools to support students in expanding their knowledge and developing a more comprehensive understanding of the subject matter (Puntari, 2021). These learning media may also encourage greater creativity and active student involvement during classroom activities (Sailer & Homner, 2020). Couple cards are designed to facilitate meaningful engagement with learning content, thereby helping students strengthen both conceptual understanding and information retention (Puntari, 2021). Flashcards, in contrast, function as supporting reading materials that assist

students in recognizing, organizing, and interpreting written information more effectively (Aziza & Yulia, 2022).

CONCLUSION

The results demonstrated that the implementation of the Couple Card learning medium significantly influenced the learning outcomes of Grade XI students at SMAN 13 Makassar in the human musculoskeletal system topic. The experimental group obtained an average posttest score of 90.5, exceeding the control group's mean score of 84.4. Statistical analysis using an independent-samples t-test produced a two-tailed significance value of 0.013, which was below the 0.05 significance threshold. This result led to the rejection of the null hypothesis and supported the alternative hypothesis. Overall, the findings suggest that the Couple Card medium can serve as an effective instructional option for enhancing students' learning achievement.

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