

**Enhancing Motivation and Students' Learning Outcomes with *Orang Kayo Hitam* Comic in Physics Learning****Haerul Pathoni^{1*}, Qodariah Barkah², Alrizal¹,
Wella Meliza¹, and Louisiana Muliawati³**¹Universitas Jambi, Jambi, Indonesia²Universitas Islam Negeri Raden Patah Palembang, Palembang, Indonesia³Universitas Islam Negeri Sulthan Thaha Saifuddin Jambi, Jambi, Indonesia*haerul_pathoni@unja.ac.id**Abstract**

This research is based on the low physics learning outcomes of senior high school students. This study aims to increase students' motivation and learning outcomes using *Orang Kayo Hitam* Comic in physics learning. The comic used for this study is based on a folktale from Jambi Province entitled *Orang Kayo Hitam*. The study was conducted at SMA Negeri 9 Kota Jambi, grade 10, in 2022. This kind of study is Classroom Action Research (CAR), and it is divided into three cycles. The planning, implementation, observation, and reflection stages are the four phases that make up each cycle. Based on the study results, 44% of the first cycle's students achieved the minimum qualifying score (KKM). In the second cycle, it was 56%, and in the third, it became 78%. The N-gain value of 0.4 indicates that the increase in student motivation is moderate. According to the study's findings, using *Orang Kayo Hitam* comic can enhance students' motivation and their learning outcomes.

Keywords: comic; motivation; learning outcomes; physics

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Physics can be viewed as a product, an attitude, and a process (Guido, 2018; Herliandry et al., 2018; Stefan & Ciomoş, 2010). Physics as a product results from systematically organized knowledge and practical experience in the search for concepts or knowledge (Galili & Lehavi, 2006; Murdani, 2020). Physics as an attitude describes scientific attitudes towards researching to find knowledge or concepts

(Asriyadin et al., 2021; Maison et al., 2020). Studying physics emphasizes learning ideas or information through observation, investigation, analysis, and reasoning (Bukifan & Yuliati, 2021; Hidayaturrohman et al., 2017). Physics does not only contain formulas or theories but also contains many concepts that must be understood in depth and can be applied in daily life. Students find it challenging to understand physics theories and abstract concepts (Sa'diyah



et al., 2017). This is consistent with the observation results through interviews with some students in 10th grade and teachers of physics at SMA Negeri 9 Kota Jambi. Based on the results of observation, students find difficulties in understanding physics. This is due to abstract concepts and the limited available learning resources. Therefore, suitable learning media are required to be used to solve students' problems (Ogunleye, 2009; Widioko, 2021).

The word "media" comes from the Latin word "medium," which means "intermediate" (Anggraeni et al., 2019; Firnhammer, 2014). The media is an intermediary, sending messages from the sender to the recipient (Prasasti et al., 2019). In the learning process, media send information from teachers to students (Gaol & Sitepu, 2020; Simanjuntak et al., 2019). Learning without using media will make learning less optimal (Amiruddin et al., 2021). Previous studies show that using interesting learning media such as mission book games and Adobe Flash animation can help students understand abstract concepts more easily (Reshmayanti et al., 2022; Rudiansyah et al., 2021). Utilizing comics as instructional materials can help improve the motivation of learners to study (Pathoni et al., 2020).

Comics are among the engaging media that can be used to teach physics. Comics are a visual communication medium containing information, ideas, and messages poured into images as attractively as possible. Comics have advantages such as increasing students' interest in learning, making the material more interesting and helping students to understand abstract concepts (Khotimah & Hidayat, 2022). It is expected that using comic learning materials will provide an alternative for engaging and enjoyable learning, preventing students from becoming disinterested in what their teachers are teaching them. This

will increase their motivation to study and improve their learning results.

This research is relevant to Novisilta (2016). The research concludes that the application of the learning model using comics media for the physics learning process on the material concept can improve students' learning outcomes for junior high school students. This is consistent with the study conducted by Aprina (2016), who also concluded that the pre-action learning outcomes obtained an average value with a classical completeness of 53%. The average value increased to 65 with a classical completeness of 68% after being given action in cycle 1. In cycle 2, the average value also increased to 81, with a classical completeness of 88%.

In this study, we use a comic based on Jambi's folktale, *Orang Kayo Hitam*, to increase students' learning outcomes. *Orang Kayo Hitam* is a folktale from Jambi Province. The purpose of using *Orang Kayo Hitam*'s storyline is to make the comic more interesting. This corresponds with the research (Wicaksono et al., 2021), which indicates comics are more engaging when they include a folktale plot. Furthermore, folk tales in comics can serve as a tool for character education, conveying moral messages and teaching children essential values (Supardjo et al., 2020).

The previous study also shows that the *Orang Kayo Hitam* comic is a viable tool for physics education and can motivate students to learn physics (Pathoni et al., 2020). Newton's Law concepts may be applied to some scenes in the *Orang Kayo Hitam* comic, including pulling, pushing, horseback riding, and canoeing. This can simplify the concepts of Newton's law for students to understand.

METHOD

This study implements Classroom Action Research (CAR), which is based

on the Kemmis and McTaggart model (Kemmis et al., 2014). This study was conducted at SMA Negeri 9 Kota Jambi, located at Jalan Berdikari, Paal Merah, Kota Jambi, from January to February 2022. This research consisted of three cycles; in each cycle, the class action research had four main stages: planning, implementing, observing and reflecting. In this study, the indicators of minimum criteria (KKM) used to measure the success of teaching improvement are if there is an improvement of about 75% of students achieving. With a KKM score of 70 in learning, the intervention improves learning outcomes. The average score was used as the study's quantitative data analysis method for students' learning outcomes using the following formula:

$$\bar{x} = \frac{\sum x}{N} \quad \dots (1)$$

Remark:

- \bar{x} = Mean (Average)
- $\sum x$ = The sum of the existing scores
- N = The quantity of occurrences/quantity of students

The formula for calculating the percentage

$$P = \frac{F}{N} \times 100\% \quad \dots (2)$$

Remark:

- P = Percentage Number
- F = Many students are competent or incompetent

We also calculated the N-Gain Score by the formula developed by (Hake, 1998), which is as follows:

$$N - Gain = \frac{(S_{Post} - S_{Pre})}{(S_{maks} - S_{Pre})} \quad \dots (3)$$

Remark

- S_{post} = Post-test Score
- S_{pre} = Pre-test Score
- S_{maks} = Maximum Score

The category of N-Gain score in Table 1.

N-Gain Score	Category
$N-Gain > 0.70$	High
$0.30 \leq N-Gain \leq 0.70$	Moderate
$N-Gain < 0.30$	Low

RESULT AND DISCUSSION

Students respond positively to *Orang Kayo Hitam* comics. The comics make their understanding and learning more interesting. The researcher collected data on student motivation using comics as a learning support medium before and after learning. The results of measuring students' learning motivation using the gain score are shown in Figure 1.

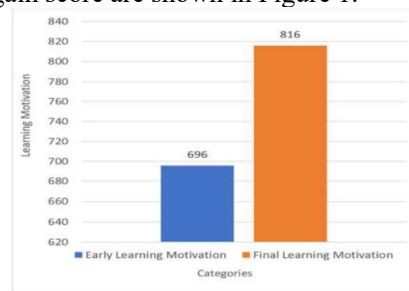


Figure 1 Diagram of student learning motivation

Regarding Figure 1, there was an increase in motivation from before using comics to after using comics in physics learning. Increasing motivation could be determined by the gain score of 0.4, including the moderate category.

Table 2 shows the learning outcomes of 10th-grade students at SMA Negeri 9 Kota Jambi in cycle I utilizing Newton's Law comics based on the Jambi *Orang Kayo Hitam* Folktale.

Table 2 Pretest and posttest in cycle I

Criteria	Pretest	Posttest
	I	I
Average	52.8	61.11
Maximum Value	75	100
Minimum Value	25	25
Complete (≥ 70)	4	8
Incomplete (≤ 69)	14	10
Complete Percentage	22%	44%

Based on the data in Table 2, only 44% of students achieved the physics learning outcomes in the first cycle. This did not reach the desired target listed in the success indicators (the number of students who achieved the KKM or a score of ≥ 70 at least 75% of all students). Figure 2 also describes the acquisition of students' learning outcomes in cycle I.

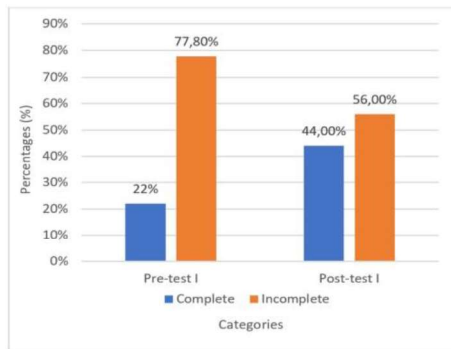


Figure 2 Graph of students' physics learning results pretest and posttest cycle I

Table 3 indicates that the N-Gain estimate of enhancing student learning outcomes falls into the low category.

Table 3 N-gain score

<i>N-Gain</i>	<i>Category</i>
0.18	Low

The students' learning outcomes in cycle II can be seen in Table 4.

Table 4 Cycle II pretest and posttest results

Criteria	Pretest II	Posttest II
Average	57.8	62.7
Maximum Value	71	100
Minimum Value	43	42
Complete (≥ 70)	4	10
Incomplete (≤ 69)	14	8
Complete Percentage	22%	56%

Using the information from Table 4 above, only 56% of students completed physics learning outcomes in the first cycle. The percentage of students who completed physics learning outcomes in

cycle II also did not reach the desired target listed in the success indicators. Table 5 shows that the N-Gain estimate for enhancing students' learning outcomes is in the low category.

Table 5 N-gain score

<i>N-Gain</i>	<i>Category</i>
0.2	Low

The acquisition of students' learning outcomes in cycle II can also be described in Figure 3.

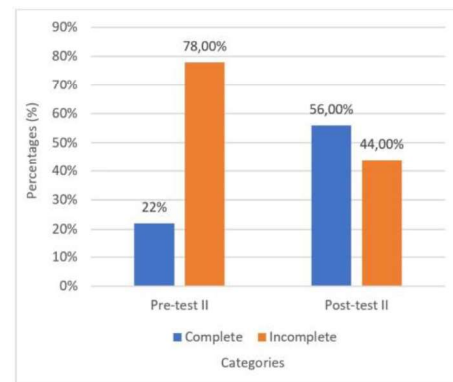


Figure 3 Graph of physics learning results of pretest and posttest students cycle II

Table 6 displays the learning outcomes for 10th grade students at SMA Negeri 9 Kota Jambi in cycle III of the physics learning process, which utilizes comics based on Newton's Law and the Jambi *Orang Kayo Hitam* Folktale.

Table 6 Pretest and posttest results cycle III

Criteria	Pretest III	Posttest III
Average	50.0	72,2
Maximum Value	75	100
Minimum Value	25	50
Complete (≥ 70)	2	14
Incomplete (≤ 69)	16	4
Complete Percentage	11%	78%

Table 7 N-gain score

<i>N-Gain</i>	<i>Category</i>
0.56	Middle

Based on the data in Table 6, Figure 4 describes the acquisition of student learning outcomes in cycle II.

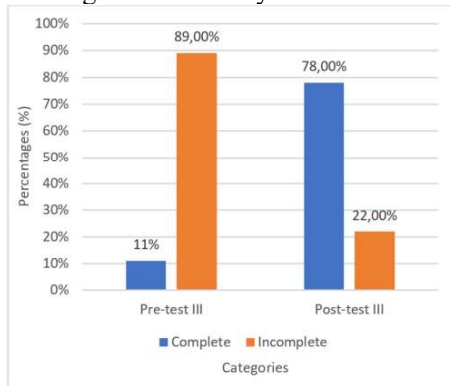


Figure 4 Graph of students' achievement in physics pretest and posttest cycle III

The percentage of students who completed physics learning outcomes in cycle III had reached the desired target (the number of students who achieved the indicators of minimum criteria (KKM) or a score of 70, at least 75% of all students). Based on Table 7, 78% of the students have reached the KKM.

Based on the learning outcomes obtained by students in 10th-grade SMAN 9 Kota Jambi in the first cycle, it shows that out of 18 students, eight students or 44% of students, have reached the KKM score, while ten students or 56%, have not completed. However, some students continue to stay below the KKM. Students' continued failure to adapt the learning materials for the physics comics while studying is the reason they have not received a score of 70. Teachers are still ineffective in using comics with the material being taught, and teachers are still lacking in guiding students in discussion. Furthermore, after learning in the second cycle was carried out, 10 or 56% of students had achieved the KKM score, while 8 or 44% of the other students had not achieved the KKM score or had not completed it.

In cycle II, the indicators of research success have not been achieved. This is caused by several factors, such as researchers still not giving reinforcement to students and students are also still less thorough when working on physics problems.

In cycle III, students' learning outcomes in physics increased. This increase can be seen from the percentage of completeness obtained by students; namely, from 18 students, 14 or 78% have reached the KKM score, while 2 or 22% of other students have not achieved the KKM score. Judging from the percentage of students who have achieved the KKM score, it can be concluded that the research indicators have been achieved, namely students who have achieved the KKM score more than 75%.

Based on the explanation above, it is certain that Newton's Law comic media can enhance physics learning outcomes, which is based on the Jambi Folktale *Orang Kayo Hitam*. According to the research findings, using comics to teach physics can improve learning outcomes and student motivation. This is consistent with a study by Badeo et al. (2021), who discovered that learning modules based on comics can improve motivation and conceptual understanding. These results, which demonstrate that Android-based comic media for Newton's Gravity can boost student motivation, are corroborated by research by Nikmah et al. (2019). According to Sari et al. (2020), when creating a physics comic based on folklore, the student's capacity for mathematical representation and creative thought was enhanced. These studies collectively suggest that comics can be a valuable tool for enhancing students' learning outcomes in physics.

CONCLUSION

After being given action in the first cycle, the students' post-test average

score was 61.11, with an N-gain score of 0.18 in the low range. The post-test average score of the students increased to 62.7 with an N-gain value of 0.2, which was also in the low range, following their further intervention in cycle II. In the third cycle, the post-test average score of students increased to 72.2, with an N-gain score of 0.56 in the moderate category. For the percentage of completeness of KKM (70). In cycle I, students who achieved KKM increased to 44%. In the second cycle, there was an increase; students who achieved KKM became 56%, while in cycle III, students' KKM increased to 78%. The medium category was occupied by a rise in motivation with a value of 0.4, as determined by the N-gain calculation of student motivation. The research's findings indicate that students' motivation and learning outcomes improved when Newton's Law material was given through comics.

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