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Students' Response to the ECIRR Learning Model Containing Local Wisdom on Linear Motion Topic

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Abstract

This research aimed to describe students' responses to the ECIRR learning model that contained Nusantara's local wisdom on the topic of linear motion and to describe the implementation of the learning model during trials in small groups. The type of this research and development was ADDIE. The subjects of the small group were ten students who learned Fundamental Physics. The data instruments were response questionnaires and observation sheets. The data analysis technique was descriptive statistics. Based on the data analysis, it was known that the students gave a positive response to the developed learning model. In addition, implementing the learning model in lectures was very good. Thus, it can be concluded that the ECIRR learning model containing local wisdom can be used in the Fundamental Physics lecture on linear motion.

Keywords: ECIRR Learning Model; Local Wisdom; Response; Linear Motion

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INTRODUCTION

Everyday life cannot be separated from the phenomenon of motion. One of the motions studied in physics is linear motion. Although the phenomenon of motion is often encountered in life, there are still students who have difficulty understanding the concepts and principles of motion (Nadhor & Taqwa, 2020; Pasaribu & Andriani, 2018; Ulfah, Yuliani, Azizah, & Annovasho, 2022).

Based on the results of the lecturer's observations and assessments of students taking Basic Physics 1 lecture, it is known that their average score on the topic of linear motion is not in the very good category. Their average score category was low. They also still experienced some misconceptions, so their learning outcomes were not good.

Lecturers cannot let their students, not master physics. A problem solver is needed to solve this problem. One alternative to problem-solving that can be used is to apply a learning model based on local wisdom. Various studies have proven that learning based on local wisdom can improve learning achievement (Humaidi & Adrian, 2017), encourage learning activities and the practice of problem-solving skills (Purwanti,

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Marasabessy, & Damopolii, 2019), and improve learning outcomes and creative thinking skills (Damayanti, Rusilowati, & Linuwih, 2017).

Local wisdom-based learning has been developed by various researchers (Fitriah, 2020; Fitriah, 2021; Ita & Fitriah, 2022). Innovations were then carried out to develop a local wisdom-based learning model that could help students master the concepts and principles of linear motion. The model is the ECIRR learning model, which contains the local wisdom of *Nusantara*.

The ECIRR learning model is a learning model consisting of five learning steps. These five steps are: Elicit, Confront, Identify, Resolve, and Reinforce (Diani, Yuberti, Anggereni, Utami, Iqbal, & Kurniawati, 2020; Ningrum & Suliyanah, 2021). The results of the study prove that this model can help students learn (Serevina & Khaerunisa, 2021), remediate misconceptions (Warsito, Subandi, & Parlan, 2020; Djarwo, 2020), improve learning outcomes (Ningrum & Suliyanah, 2021), and improve problem-solving skills (Septianingsih, Netriwati, & Gunawan, 2022).

Much research on applying the ECIRR learning model has been carried out. The research includes the development of distance learning tools based on ECIRR (Serevina & Khaerunisa, 2021), ECIRR learning with the pictorial riddle method (Diani et al., 2020), and ECIRR learning assisted by worksheets (Wulandari & Rusmini, 2020b). Compared to previous research, The advantage of this research is that the ECIRR learning model developed by researchers contains the local wisdom of the *Nusantara*. Thus, students are introduced to Indonesian local wisdom, namely *karaban sapi*. In this local wisdom, cows move straight at a certain velocity from a stationary initial position. The longer the cow moves, the faster it is because it is accelerating so it can reach the finish line quickly. Thus, this local wisdom contains the concepts and principles of linear motion. In addition, this research is intended for university students. This study aimed to describe student responses to the developed learning model and the implementation of each stage of the model's activities.

METHOD

This research was development research with the ADDIE model, which consists of five stages (Welty, 2007). The first stage was Analysis. At this stage, needs analysis, problem clarification, and solutions to solve problems were carried out, and learning model development goals were set. The second stage was Design. At this stage, learning outcomes, learning strategies, learning materials, media, and assessment instruments were determined. The third stage was Development. Learning models and assessment instruments were produced as draft 1 at this stage. Learning models and assessment instruments were also validated at this stage. The models and instruments were then revised according to the validation results. The fourth stage was the implementation of the application of the learning model in the classroom. The last stage was Evaluation which includes formative evaluation and summative evaluation. Based on the evaluation, a revision was made to the learning model so that a good learning model was produced. This article discusses the Evaluation stage because it asked for student responses after the learning model was implemented in lectures.

When the small group test was conducted, this study's samples were ten students who took the Basic Physics lecture on linear motion. The number of samples was small because the number of students taking the course was the case. The sample was selected using a purposive sampling technique. The place of this research was one of the Physics Education Study Programs at an Islamic university in South Kalimantan. Data were taken in June 2022.

Data collection techniques in this study were observation and survey. The research instrument used observation sheets and response questionnaires. The observation sheet itself is divided into the lecturer activity observation sheet and the student activity observation sheet when the learning model is applied in the classroom. Three validators have validated all instruments. The validation results show that the instruments are valid based on the Aiken formula (Aiken, 1985).

The collected data was then analyzed by determining the percentage of student responses. Furthermore, based on the percentage, it was categorized into several criteria, which can be seen in Table 1 (Riduwan, 2015). Then, lecturer activities and student activities were analyzed by determining the average score. Furthermore, the average score is classified by category (Widoyoko, 2019). It can be seen in Table 2. Data analysis was then discussed until conclusions were obtained.

Table 1. The category of student responses

Percentage	Category
81% - 100%	Very good
61% - 80%	Good
41% - 60%	Fair
21% - 40%	Poor
0% - 20%	Very poor

Table 2. The category of learning model implementation

Average of Score	Category
$X > 4.21$	Very good
$3.40 < X \leq 4.21$	Good
$2.60 < X \leq 3.40$	Fair
$1.79 < X \leq 2.60$	Poor
$X \leq 1.79$	Very poor

RESULTS AND DISCUSSION

a. Students' Response to Learning Model

One indicator that the learning model is good is getting a good response from students. Students here are users of learning models in classroom activities. They follow each stage of learning from the model. Therefore, student responses need to be considered to find out their opinion on the product being developed (Fitriah, 2020; Risandi, Panjaitan, & Titin, 2015; Hadi, Hidayati, & Rosidi, 2020). Figure 1 below shows student responses to the ECIRR learning model containing the local wisdom of *Nusantara* on the topic of linear motion.

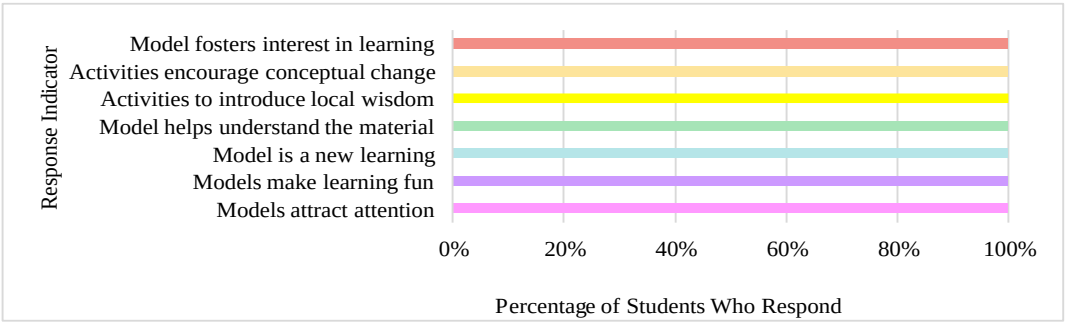

Figure 1 Student Responses to The ECIRR Learning Model Containing the Local Wisdom of *Nusantara*

Based on Figure 1, all or 100% of students responded well to each question indicator. Students stated that the ECIRR learning model containing the local wisdom of *Nusantara* on the topic of linear motion fostered an interest in learning. In addition, the learning model encourages students to experience conceptual change. So, students feel a change in the mastery of concepts from less good to better. This is one of the goals of applying this learning model (Djarwo, 2020; Diani et al., 2020; Islamiyah, Rahayu, & Dasna, 2022; Serevina & Khaerunisa, 2021; Wulandari & Rusmini, 2020a)

The ECIRR learning model makes students experience conceptual changes and introduces them to local wisdom. It is relevant to the concepts and principles of linear motion. This received a very good response from students. Local wisdom associated with Linear motion further helps students understand the material (Parmiti, Rediani, Antara, & Jayadiningrat, 2021; Oktavia, Usmeldi, & Yohandri, 2018). This is also in line with previous research, which proves that learning models based on local wisdom can motivate students to study physics to improve mastery of the material. (Wati, Rizka, Misbah, Hartini, & Mahtari, 2020). Therefore, students responded well by stating that the model helped them understand the material.

Students responded well to the learning model because this model had never been applied in the classroom. This is based on the student's response that this model was a new learning experience. They just implemented this. It also makes learning fun. Not only that, but the ECIRR learning model containing the local wisdom of *Nusantara* has also succeeded in attracting their attention, so the response is very good. Previous research also revealed that learning models containing local wisdom could attract attention and foster interest in learning (Annur, Fahrunnisa, Salam, & Mahtari, 2018; Hartini, Misbah, Helda, & Dewantara, 2017).

b. Implementation of Learning Model Activities

The learning model consists of lecturer activities and student activities. Two observers then observed these two activities for their implementation when the model was implemented in the classroom. The implementation of these two activities is determined to determine whether the model is practical when applied by lecturers and students (Fitriah, 2021; Ita & Fitriah, 2022). Figure 2 shows the ECIRR learning model steps.

Elicit Step

Confront Step

Identify Step

Resolve Step

Reinforce Step

Figure 2 ECIRR Learning Model Steps

Figure 3 shows the implementation of lecturer activities which are presented. Based on Figure 3, it can be seen that the implementation of the activities of lecturers at each stage of learning is in the very good category.

Lecturer activities in the learning model can be explained as follows. The first stage is Elicit, where the lecturer explains local wisdom from Madura, namely Karaban Sapi. The lecturer then gave assignments to students to answer various physics questions related to cow carbine. This is done to explore students' initial knowledge (Septianingsih et al., 2022; Pahrudin et al., 2020).

The second stage is Confront stage. At this stage, the lecturer assigns students to answer various questions on the Student Worksheet. These questions cause cognitive conflicts so that students are confused about the answers in the Elicit phase (Wulandari & Rusmini, 2020a; Pratama, Anggraini, Yusri, & Mufit, 2021). The purpose of this stage is to cause doubts in students (Ningrum & Suliyanah, 2021; Wulandari & Rusmini, 2020b).

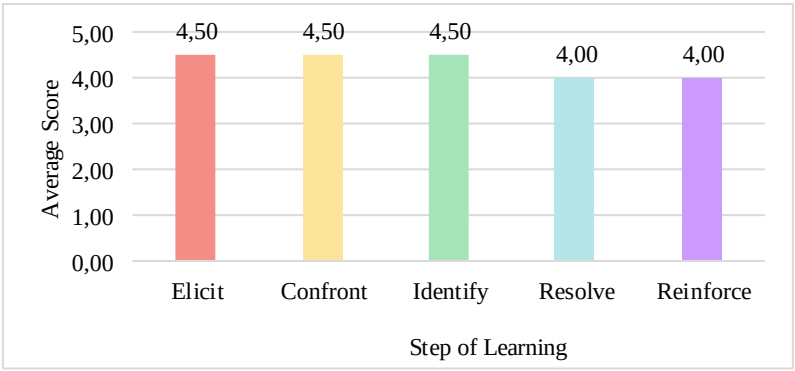

Figure 3 The Implementation of Lecturer Activities When Using The ECIRR Learning Model Containing the Local Wisdom of *Nusantara*

The third stage is Identify stage. At this stage, the lecturer assigns students to express the reasons for answering questions at the Elicit stage and their beliefs about these answers. This is done to identify students' misconceptions (Warsito et al., 2020).

The fourth stage is Resolve. At this stage, the lecturer explains the scientific concept (Serevina & Khaerunisa, 2021). Next, the lecturer checks the students' scientific conceptions by assigning them to answer questions. The answers to these questions are then discussed together.

The last stage is Reinforcement. Students already have the correct scientific concepts at this stage, so the lecturer gives them more difficult questions as reinforcement (Diani, Yuberti, Anggereni, Utami, Iqbal, & Kurniawati, 2020). These problems are solved independently. The lecturer also asked students to draw conclusions about their learned linear motion topic. Lecturers then provide feedback and reflection on learning (Diani, Yuberti, Anggereni, Utami, Iqbal, & Kurniawati, 2020).

The following is the implementation of student activities presented in Figure 4. Based on Figure 4, the implementation of the activities of students at each stage of learning is in the very good category. This is in line with the response given by students to the ECIRR learning model containing the local wisdom of Nusantara. Hence, the results of research on aspects of response and implementation are both very good.

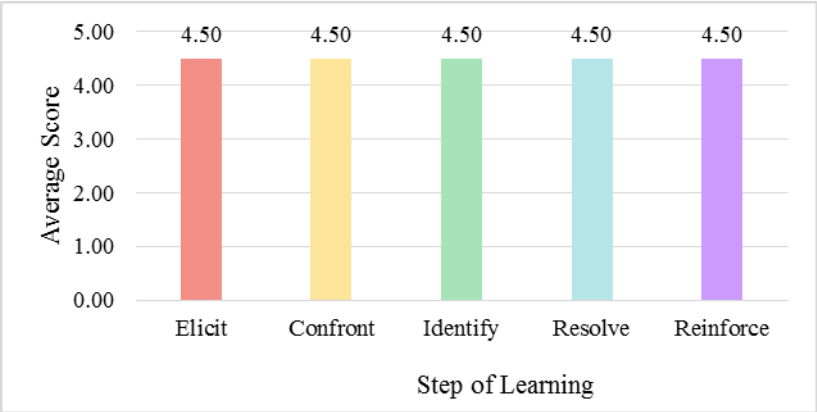

Figure 4 The Implementation of Student Activities When Using the ECIRR Learning Model Containing the Local Wisdom of *Nusantara*

The student activities in the learning model can be explained as follows. The first stage is Elicit, where students listen to explanations about local wisdom from Madura, namely Karaban Sapi. Karaban Sapi Cow racing is related to linear motion, the physical quantities of position, speed, velocity, and acceleration made by the cow. Next, the students answered various physics questions related to Karaban Sapi. They answer the question according to their prior knowledge (Septianingsih et al., 2022; Pahrudin et al., 2020).

The second stage is confronting. At this stage, students answer various questions listed on the Student Worksheet. These questions provide cognitive conflict so that they experience confusion over the answers in the Elicit phase (Wulandari & Rusmini, 2020a; Pratama et al., 2021).

The third stage is Identify. At this stage, students express the reasons for answering questions at the Elicit stage and their beliefs about these answers. At this stage, they realize the misconceptions that have been going on (Warsito et al., 2020).

The fourth stage is Resolve. At this stage, students get an explanation of scientific conceptions (Serevina & Khaerunisa, 2021). Next, they answered questions to finalize their conception. The answers to these questions are discussed with the lecturer in class.

The last stage is Reinforcement. At this stage, the correct scientific conception has been mastered by students. Therefore, students solve more difficult problems than before

by capitalizing on these scientific conceptions (Diani et al., 2020). In addition, students make conclusions on the topic of linear motion. Students then get feedback and reflection on their learning (Diani et al., 2020).

CONCLUSION

Based on the research, it can be concluded that the ECIRR learning model containing the local wisdom of the *Nusantara* received a very good response from students. In addition, implementing the activities of lecturers and students when applying the learning model is also very good. Each stage of the learning model activity can be carried out very well. So, the ECIRR learning model containing the local wisdom of *Nusantara* can be applied to learning Basic Physics on the topic of linear motion. Furthermore, this developed model can be tested in the field with a more significant number of samples because this research sample was very small. In addition, future research can examine the lecturer's response to this learning model because this research has not examined it. Lecturers who use this learning model in class should also be equipped with teaching materials, such as modules that contain the relevance of physics topics to the local wisdom of *Nusantara* so that they can teach more easily.

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