



The Exploration of Character Values in Physics Learning on Momentum, Impulse, and Collision Materials

Astalini^{1*}, Darmaji², Dwi Agus Kurniawan³, Sri Wina Oktavia⁴, Elza Triani⁵, Miftahul Zannah Azzahra⁶ 

^{1,2,3,4,5,6}Physics Education Study Program, Faculty of Teacher Training and Education, Universitas Jambi, Indonesia

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ABSTRAK

Pendidikan karakter adalah segala sesuatu yang dilakukan guru untuk mempengaruhi karakter peserta didik. Guru membantu membentuk perilaku siswa dengan memberikan contoh, cara berbicara atau penyampaian materi yang baik, dan berbagai hal lain yang terkait. Penelitian ini bertujuan untuk mengeksplorasi nilai-nilai karakter dalam pembelajaran fisika pada materi momentum, impuls, dan tumbukan. Metode yang digunakan yaitu kualitatif dengan jenis penelitian study dokumentasi, Adapun Instrumen yang digunakan peneliti yaitu dengan mengumpulkan buku-buku baik itu softbook/hardbook, serta literatur yang berkaitan. Penelitian ini menunjukkan hasil bahwa pada kelas X terdapat beberapa karakter yang tidak diterapkan oleh peserta didik saat proses pembelajaran, hal ini disebabkan karena pada proses pembelajaran siswa tidak diarahkan untuk nilai karakter tersebut, tentunya akan berdampak negative bagi siswa karena akan berpengaruh pada saat proses pembelajaran siswa maupun saat sosial pada lingkungan siswa tersebut. Rekomendasi penelitian yaitu diharapkan kedepannya lebih disempurnakan nilai karakter peserta didik agar dapat membangun dan menghasilkan generasi yang lebih baik. Urgensi penelitian ini adalah selama pembelajaran guru dapat menambahkan karakter yang belum ada di buku guru agar pendidikan karakter bagi siswa dapat memenuhi nilai-nilai karakter.

ABSTRACT

Character education is everything the teacher does to influence the character of students. The teacher helps shape student behavior by giving examples, how to speak or deliver good material, and various other related things. This study aims to explore character values in physics learning in the materials of momentum, impulse, and collision. The method used is qualitative with a type of documentation study research. The instrument used by researchers is to collect books, both softbooks/hardbooks, as well as related literature. This research shows the results that in class X there are several characters that are not applied by students during the learning process, this is because in the learning process students are not directed to these character values, of course it will have a negative impact on students because it will affect the student learning process. as well as social moments in the student's environment. The research recommendation is that it is hoped that in the future the character values of students will be more refined so that they can build and produce a better generation. The urgency of this research is that during learning the teacher can add characters that are not yet in the teacher's book so that character education for students can fulfill character values.

1. INTRODUCTION

Education is the main key to human resource development. The quality of human resources is expected to be able to create a just and prosperous Indonesia Gold 2045, safe and peaceful, as well as progressive and global (Harahap, 2019; Susilo et al., 2022). In addition, education is a process to achieve change, the development of one's ability to prove self-confidence and innovative attitudes and behavior (Gök & Şen, 2014; Harahap, 2019). The National Education System in Indonesia seeks to build the character of the younger generation as stated in the education curriculum since the enactment of Law Number 20 of 2003 (Halek et al., 2021; Hayati et al., 2020; Nuryana & Suyadi, 2019). This is the basis for implementing and providing character education to students. Character education is everything that teachers do to influence the character of students. Teachers help shape the behavior of students by providing examples, ways of speaking or delivering good material, and various other related things (Eom

*Corresponding author.

E-mail addresses: astalinizakir@unja.ac.id (Astalini)

& Papi, 2022; Erik & Elfreich, 2021). In particular, the curriculum includes the formation of character values in students (Enz et al., 2007; Xu, 2017). It is also explained in the *merdeka urriculum* that good character is related to knowing good, loving good, and acting good (Conner, 2015; Nuryana & Suyadi, 2019; Sudrajat, 2011). Therefore, character values are very important to be applied to students. In general, various interrelated aspects of the world of education can be seen. Character education distinguishes between education in moral character and education in intellectual character (Harun et al., 2020; Herawann & Sudarsana, 2017). In the past, character education was only charged to two subjects, namely religion and PKN. However, in reality the cultivation and formation of character through these two subjects is not enough (Nurtanto et al., 2019; Nuryana & Suyadi, 2019). We often see that not a few students do not do their schoolwork, students are not honest during exams, students do not follow school rules. Cases of delinquency committed by these students have been going on for quite a long time with various forms (Arasomwan & Mashiya, 2021; Rossouw, 2012). This identifies the weak formation of character values from schools that have not been met by students.

Spaces in physics subjects can be used as a means of developing character education values for students, as long as physics learning is carried out properly. As in the material of momentum, impulse and collision of character values that must be improved, namely religious character, environmental care, and social care. That religious character and social care are manifestations of religious values and Pancasila which are applied in schools (Abdi, 2018; Hayati et al., 2020). Efforts that can be made to overcome the problems above are to develop a physics learning device based on character education. Character education-based physics learning tools that will be developed are syllabus, lesson plans, worksheets, teaching materials, and assessments. For teaching materials, a learning module will be developed (Diani, 2015; Jamilah, 2021). This character education process is directed at students who have intellectual intelligence, life skills, and good character (Hayati et al., 2020; Huang, 2020). This concept of character education will build character values in physics learning. Research on the analysis of this character value in physics learning has been carried out explained that education plays an important role in developing the potential of students, so that students have the characters and skills needed to contribute in the world of education and globally (Ong, 2022; Ramadoni et al., 2019; Wong, 2020). Teachers are required to understand student character education according to the concept of education (Julia & Supriyadi, 2018; Putra et al., 2021). To increase students' understanding of character values, teachers can identify through teaching experience, curriculum policies and training or socialization of character education that has been attended (Julia & Supriyadi, 2018; Pewkam & Chamrat, 2022; Soysal, 2022). Teachers can also make lesson plans, implementation of learning, and planning evaluation of student learning outcomes.

Similar research on character values in physics learning has also been carried out explained that the values of character education can be integrated into the physics learning process (Diani, 2015; Ergen, 2019; Saripudin et al., 2021). This indicates that there are spaces in physics subjects that can be used as a means of developing character education values in students. Character education should be integrated into all courses including studies by making use of the development of student behavior (Ergen, 2019; Rizal et al., 2022; Saripudin et al., 2021). Character education delivered through the curriculum in schools encourages students to show positive behavior in students' daily lives by applying values such as love, respect, honesty, justice and tolerance (Deveci & Ture, 2022; Wijayanti & Pratomo, 2019). Research on content analysis on this character value has been done explains that integrating character education content that has been formulated into all subjects of education in daily activities in schools in schools (Huang, 2020; Susilo et al., 2022; Türküresin, 2021). Character values in education are also used as content analysis and reduce the negative impact of the character of students (Akhmad Sukri, 2022; Mistiani W, 2022). Similarly, this research is both analyzing content and identifying its impacts. The difference in the current research researchers identifies the value of the character of students so that it can be known the impacts contained in the content analysis both in the material, questions, and projects in learning physics material momentum, impulses and collisions.

Based on the description of the research, the researcher is interested in conducting this research with the formulation of the problem, namely what are the identified student character values and what is the impact if students do not have character values in the class X physics teacher's book on momentum, impulse and collision material. with the aim of research to identify student character values and analyze the impact of student character values in the analysis of content (material), questions and project assignments in class X physics learning Momentum, Impulse and Collision. The variables used in this research are religious character values, environmental care and social care. The urgency of this research is that during learning the teacher can add characters that are not yet in the teacher's book so that character education for students can fulfill character values.

2. METHODS

This research uses qualitative methods, in this qualitative research focuses on how students can understand and interact with the character values obtained at certain times and in certain contexts. Understanding student experience is essential for researchers seeking to bring it into the student's perspective (Levy, 2015). In this qualitative method, researchers use the type of research, namely non - interactive (document analysis) with data sources in the form of Physics Teacher's Book Class X Curriculum 2013. Data analysis uses the Miles and Huberman model, while what Miles and Huberman mean is presentation as a structured set of information that makes it possible to draw conclusions and collect data (Miles et al., 2014). Instruments or data collection techniques used by researchers in the form of documentation techniques, also known as documentation study are one of the basic data collection tools from historical and biographical research, and written documents, sound recordings, photos, electronic files and video are used as source data (Sekerci, 2020). The research procedure can be seen in the Figure 1.



Figure 1. Research Procedure

Based on the Figure 1, the research procedure carried out first is to study literature, the second is to analyze the character values of the research, and the last is to get the results presented in narrative and table form.

3. RESULT AND DISCUSSION

Results

The national character that must be instilled in students includes 18 characters. Based on the 2013 curriculum physics teacher's book, the material is momentum, impulse and collision. identify the student's characteristic values by making content or material analysis, problem analysis, and task analysis. In the three analyzes there are characters that students achieve and there are also characters that students do not achieve. This has a lasting and lasting impact on those students. Character values that have been identified through the physics teacher's book for class X curriculum 2013 material Momentum, Impulse and Collision so that the character values identified by students can be seen in Table 1.

Table 1. Identified Character Values on Momentum, Impulse and Collision

Character	Analysis		
	Content (Material)	Question	Task (Project)
Honest		192,193	
Religius			
Tolerance	190,191,192,193,194,196,198		
Discipline			190,192
Hard work	191,193,196,200	193	190,192
Creative	195,198,200		190,191,192,
Mandiri	193,195	193	190,192
Democratic	190,191,192,193,194,195,196,198,200		
Environmental care			
Curiosity	191,192,195,196,198,200	193	
Spirit of nationality	192		
Love the Motherland			192
Appreciating Achievements	200		191,193

Character	Analysis		
	Content (Material)	Question	Task (Project)
Friendly / Communicative	190,191,192,193,194,		
Love peace	192		
Like to read	191,192,193	193	190,192
Social care			
Responsibility		193	190,192

Based on [Table 1](#) it is known that in the content analysis there are characteristics of tolerance, hard work, independence, democracy, curiosity, the spirit of nationalism, communicative, peace of peace and fond of reading. The characters contained in the analysis of questions are honest, hard work, independent, curiosity, fond of reading and responsibility. Furthermore, the characters contained in the analysis of project tasks are discipline, hard work, creative, independent, love for the motherland, respect for achievement, fond of reading and responsibility. Character values that are not identified in material content analysis, problem analysis and project task analysis that have not been identified are religious characters, environmental care characters, and social care characters.

Discussion

After identification and analysis, the results obtained from [Table 1](#) show the character values fulfilled by students in the analysis of the material content, analysis of questions, and analysis of project assignments. From the results of the identification and analysis it can be seen that the content of the material only fulfills the character values of tolerance, hard work, independence, democracy, curiosity, national spirit, communicative, peace-loving and fond of reading. Furthermore, in the analysis of character values, only honest, hard work, independent, curiosity, love of reading and responsibility are fulfilled. Furthermore, the task analysis of the fulfilled character values is the character of discipline, hard work, creativity, independence, love for the homeland, respect for achievement, love of reading and responsibility. Because there are still a lot of character values that are not fulfilled during the physics learning process, this will certainly cause less productive learning. The impact felt by students in character building during the learning process is the internalization of character values in the form of habituation of the activities carried out by students ([de Groot & Veugelers, 2015](#); [Saripudin et al., 2021](#)). As in character values, the short-term impact on honest character, if implemented in this material, students will not cheat during exams and work on them individually, students will also do according to the abilities of these students.

In the independent character values contained in the momentum, impulses and collisions, the teacher invites students to observe and analyze each symptom to answer questions during discussions and be carried out individually. This makes students trained to do things independently and individually, especially on physics material that is considered difficult by students. This independence is considered a task in the development of students ([Cevik et al., 2022](#); [Isnaini et al., 2020](#); [Wenger_Schulman & Hoffman, 2018](#)). The value of democratic character in the impulse and collision momentum material is found when the teacher invites students to have discussions and ask questions. With the democratic character, students can express their opinions about the material with confidence and accept the opinions of their friends ([de Groot & Veugelers, 2015](#); [Hardiansyah & Mas'odi, 2022](#)). The novelty of this research lies in the analysis of the identified content, namely identifying the character values contained in the analyzed content. Where this research reviews books from the affective side only so that for further research it is expected to be able to review the content in the book from a cognitive and psychomotor perspective.

Material Content Analysis

The character values contained in [Table 2](#) are character values that are not included in the material content analysis. This will certainly have a short-term impact and a long-term impact on the three character values above. Such as the short-term impact of the absence of religious character will have a negative impact on students, because it will affect the moral and moral attitudes of these students. Students do not respect the opinions of friends or teachers when conducting discussions in class, lack of awareness of students to be able to forgive each other's mistakes including peers, decreased awareness of students about accepting each other's shortcomings ([Aswidar & Saragih, 2022](#); [Herbert & Bragg, 2021](#)). Lack of religious character and respect for the authority of religious bodies indicates the declining influence of religious bodies ([Badeni et al., 2019](#); [Taufik et al., 2021](#)). Students who do not have a religious character will lack gratitude to God almighty so that they like to do arbitrarily in society. The impact of

environmental care character values that are not owned by these students has a negative impact. such as the short-term impact, students will not care about the environment around them at school, of course students do not maintain cleanliness (Brick et al., 2019; Halek et al., 2021; Susilawati et al., 2019). The long-term impact of students not having the character of caring for the environment is that students do not maintain cleanliness at home and the surrounding environment, this will cause students to be less enthusiastic about learning because the environment is less clean. Furthermore, the value of social care characters that students do not have when learning physics also has a negative impact. such as students who do not want to participate in discussion activities with their friends (Enz et al., 2007; Isnaini et al., 2020), because the momentum lessons in this section are known to be quite difficult, it will make students who do not have social care characters find it difficult to understand learning because of the lack of cooperation and mutual assistance by peers.

Problem Analysis

The short-term impact of students not having a religious character when working on momentum and impulse questions which are known to be quite complicated makes students not have honest characters. This will have a bad impact, when students work on questions by cheating their peers (Isnaini et al., 2020; Sitorus et al., 2019). The short-term impact of students who do not have the character of caring for the environment is that students will be negligent in their obligations as students and will harm friends, such as students who often ignore and bully their friends, this causes damage to the environment of the student's friendship (Brick et al., 2019; Wenger_Schulman & Hoffman, 2018). So that environment becomes unhealthy and can cause disease. If students do not have the character of social care and care for the environment, students will have difficulty working on the questions given by the teacher. These characters affect students anti-social and don't care about his friendship environment (Nurlaeli et al., 2020; Wenger_Schulman & Hoffman, 2018).

Project Task Analysis

After analyzing the project assignments, it can be identified that the short-term impact of students does not have a religious character, namely students do not do assignments well and seriously (Afandi et al., 2019; Aswidar & Saragih, 2022). And in the analysis of this project task, students also do not have the character of caring for the environment, so students will find it difficult to work together with their peers (Amran et al., 2019; Naylor, 2014). The long-term impact of students not having religious character values is that students will be less responsible with their work and do not carry out the mandate during society or socializing. The character of social care is expected to exist in every individual, because many people today are less concerned about each other due to various things (Pat López & Sánchez Escobedo, 2019). Furthermore, the short impact of social care characters that students do not have in this chapter, students are given the task of investigating the momentum of the movement style. The absence of social cohesion among students will make students find it difficult to do assignments because miscommunication makes the students lack cohesiveness.

This character education analysis research has been done previously explained that character education plays an important role in developing the potential of students in curriculum content, in educational regulations and can be seen as the dominant ideology and mindset of students (Ong, 2022; Wong, 2020). The same thing was also done in this study, namely wanting to identify the effects of these character values through content analysis. Updates with this research, namely content analysis that is analyzed is divided into three parts, namely the content of the material, questions, and projects. The negative impacts identified from the content analysis are character values that are not yet contained in the Class X Teacher's Book of Impulse and Momentum Collisions.

4. CONCLUSION

The conclusion of this study is that content analysis in learning physics Impulsive Momentum Material and collisions have not been fulfilled as a whole in content analysis, problem analysis, and project task analysis. character values that are not obtained by students during learning are identified as having a negative impact on these students. conducting research in the future so that during learning the teacher can add characters that are not yet in the teacher's book so that character education for students can fulfill character values.

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