

Analyzing character values in learning physics materials for the 2013 business and energy curriculum and the independent curriculum

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Abstract

The purpose of this study was to analyze the character values contained in the 2013 curriculum and the independent curriculum and to distinguish the application of character values in the 2013 curriculum and the independent curriculum. The method used in this research is a qualitative method with the type of document study research. The instrument used by the researcher is a documentation technique. The subjects of this study were the 2013 Curriculum Physics Teacher's Book and the Independent Curriculum Class X Teacher's Book. The results of this study indicate that the character values in the material for effort and energy in physics learning have not been met in the content analysis, problem analysis, and project task analysis. This affects student activities in the 2013 curriculum and the independent curriculum. It is hoped that for further research, research variables can be reproduced so that research results are more effective.

Keywords: 2013 curriculum, character education, physics learning, independent curriculum

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1. Introduction

Education is the process of developing self-ability. Basic education in Indonesia has to serve as the foundation for student personality formation concerning student character, college and university education often provide broad knowledge and theory that could be applied to a variety of professions within a certain field. The process of education in schools is directed at humans who have intellectual intelligence, life skills, and also good character (Hayati et al., 2020; Marini et al., 2018; Maryanti & Nandiyanto, 2021). Education is not only a process of knowledge transfer but also a process of value transfer, to create qualified and educated civilians. The character should present systemically and totally in each unit and level of education. Teacher education institutions are tasked to develop future teachers proficient in the science content and well-versed in their pedagogy (Antipolo & Rogayan, 2021; Baharun, 2017; Susilo et al., 2022). To achieve the goals of education, students are equipped with the knowledge understanding, and skills. The purpose of childhood education has been to cultivate both the moral character and the intellect of youth. Without a qualified education system, science is not able to be absorbed properly by the community, especially the younger generation which continues to develop (Assa'idi, 2021; Benninga et al., 2003; Fomunyan, 2020). To achieve the goals of education, there must be an educational curriculum.

The curriculum is a collection of subjects. Component education, such as curriculum, teachers, and systems assessment, not only focuses on developing intellectual intelligence but also pays attention to two other aspects, namely psychomotor and cognitive development, teacher education curriculum content compiled together basic course components, course content, and courses in pedagogy and teaching in schools (Hayati et al., 2020; Kisige et al., 2021). The curriculum of lifelong educational activities can be better designed for the most likely needs, reflections on decolonizing teacher education curricula imply that teacher education needs to be contextualized within this frame of thinking (Ajani & Gamede, 2021; Karacabey & Bozkus, 2019). Teachers try to improve the design and delivery of their lesson plans by using the resources available in their existing curriculum. Students need to learn and understand, construct a concept map to improve the students' understanding, and assessment of student learning outcomes is important. With the implementation of the assessment, the teacher can find out the learning outcomes, student learning progress, and student conception, and can evaluate the learning process (Batir & Sadi, 2021; Samsudin et al., 2021; Suprpto et al., 2020). From the description above, it can be stated that the educational curriculum used in each country must be appropriate to achieve educational goals.

Character education is needed to educate the younger generation to have a good identity (Sarkadi et al., 2022). Character is related to the behavior, morals, and character that are inherent in everyone. A character is the personality or behavior of a person built due to the internalization of various virtues that are then used as the base to think and act, the interaction with other people will make the social character and the national character afterward, education of moral values, attitudes, and character (Qin et al., 2022). It is a learning method that encourages the development of ethical and responsible individuals by teaching good values that humans should (Orona et al., 2024; Asfihana, 2021; Badeni & Saparahayuningsih, 2021; Harun & Manaf, 2020; Miller, 2024). Character education implementation in schools is related to the academic achievement of students in those schools and has great intrinsic appeal, to create qualified and educated civilians; the character should present systemically and totally in each unit and level of education (Baharun, 2017; Benninga et al., 2003). The students who have good intellect but who have not been equipped with good attitudes/characters do not have any assurance that they will be successful in dealing with the era. Early age is a critical age to form personal character. Failure to instill morals in students will cause problems in the future (Raikes et al., 2023). Character education continues to be developed through various education programs within the Ministry of Education and Culture (Julia & Supriyadi, 2018; Marini et al., 2018; Zurqoni et al., 2018). Character education is not only instilled by educators in schools, but character education can be instilled from anywhere such as from parents and the surrounding environment (Qvortrup & Lykkegaard 2022).

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Of the three aspects, a very important foundation to instill in students to interact with others is attitude or character. Character education needs to be instilled so that students will be ready when competing with the progress of the times that are increasingly falling in the manners of the. Character education is a deliberate attempt to help people understand, care for, and act on human values (Firdaus et al., 2022; Istiningsih, 2016). According to Lavasani & Khandan (2011), there are nine pillars of character education, those are (1) love of God and truth; (2) responsibility, discipline, and independence; (3) trust and honesty; (4) respect and courtesy; (5) affection, concern, and cooperation; (6) confident, creative, hardworking, and never give up; (7) justice and leadership; (8) kind and humble; and (9) tolerance, peace-loving and unity. Character education can take the form of material about religious education, fondness for reading, rewarding achievements, care for the environment, social care, national spirit, and love of the motherland (Cox & Maschi, 2012). The values of such a large and diverse character become an important task for all involved to be taught, well directed at the learning process. In this study, the researcher analyzed character values that were not achieved, especially physics learning in class X material of magnitude and measurement in the 2013 curriculum teacher's book and the independent learning curriculum.

Energy is the basis of any human growth and development (Subahi, 2020). Energy sources are divided into renewable and non-renewable energy sources, technological and scientific developments associated with the increasing population. Countries are generating policies that highlight energy sources that play a part in global competition. The rising world population, the development and increased use of technology, and the use of more energy for a comfortable lifestyle have resulted in a constant increase in the need for energy, and the energy problem (Demirbag & Yilmaz, 2020; Genç & Akilli, 2009; Izgi Onbasili, 2020). Due to the intensity of climate change, the most immediate and reliable solutions to meet energy needs within the context of a sustainable future are proposed measures for improving energy efficiency and harnessing Renewable Energy Sources (RES), being sensitive to renewable energy resources for pre-service teachers who will educate future generations will also make students aware of the issue (Çelik, 2021; Liarakou et al., 2021). Energy is recognized as a major learning objective in science, as it is considered a cornerstone for students' understanding of other concepts and phenomena in the physics curriculum. To apply renewable resources, the right decision requires the right knowledge, attitude, and approach (Revák et al., 2019; Toli & Kallery, 2021). Renewable energy comes from natural processes that are used continuously.

Research on character education in the 2013 curriculum has been done before. Iftanti & Madayani, (2019) and Tohri et al. (2022) explained that character education is also important to realize a peaceful and prosperous life as specified in the 2013 Curriculum. The purpose of education is to develop skills, knowledge, and character (Winarno, 2016; Rustan et al., 2018; Nuryana & Suyadi, 2019; Sánchez-Agustí & Miguel-Revilla, 2020; Khojir et al., 2021; Yilmaz et al., 2021). It is known that character education is important to be applied to the 2013 curriculum.

Research on character education in the independent curriculum has also been carried out previously by Tohri et al. (2022) and Rosala & Budiman (2020), explaining that the development of national character is the core of the national dynamics that occur in the course of history, both during the colonial period and during the independence period. Modern education is education that adopts the 2013 curriculum and the independent campus learning curriculum (MBKM) (Vhalery et al., 2022; Nuryana & Suyadi, 2019; Yudhar et al., 2021). Education in Indonesia has implemented an independent curriculum (Halek et al., 2021; Yudhar et al., 2021). This has encouraged the use of the 2013 curriculum for the independent curriculum.

1.1. Purpose of the study

The 2013 curriculum and the independent curriculum play an important role as guidelines for designing student education improvements. The variables used are religious character values, creative characters, peace-loving characters, and responsible characters. The objectives of the study are to 1)

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identify the character values contained in the 2013 curriculum and the independent curriculum; and 2) to distinguish the application of character values in the 2013 curriculum and the independent curriculum. With this research, it is hoped that the characters that appear in students can be observed properly. The formulation of the problem in this study is as follows:

- 1) What character values are identified in the 2013 curriculum and the independent curriculum?
- 2) What distinguishes the application of character values in the 2013 curriculum and the independent curriculum?

2. Method and materials

This study uses a qualitative method. In this qualitative method, the researcher uses a type of documentation study research. Document studies are widely used in qualitative research because they are a stable source, natural in nature, useful as evidence of a test and the results can open an understanding of something being investigated (Yuningsih et al., 2022).

2.1 Research Subject

The subject of this research is the character values in the particle dynamics material in the Physics Teacher's book for Class X Curriculum 2013. question. Character variables that are not in it are religious character, tolerance, national spirit, and love for the homeland.

2.2 Data collection instruments

The instrument used by the researcher is the documentation technique by collecting relevant literature on the topic under study, both from soft books/handbooks. The data in the document study is collected by collecting and analyzing documents, both written documents, images, works, and electronics and the results reported are in the form of an analysis of these documents.

2.3 Data analysis technique

The data analysis technique used is a qualitative analysis which identifies several character values contained in the class X Physics Teacher's book on particle dynamics which has been reviewed previously and then grouped into several aspects, namely material content, questions, and assignments. To support this research, a search for sources and literature as well as cases that occurred previously was also carried out, to strengthen the analysis carried out. After obtaining relevant literature and analyzing it in the teacher's book by looking at the material content section, questions, and assignments obtained 18 characters that must exist in the learning process. However, sometimes there are still some character values that are not found in the learning process.

2.4 Procedure and ethics

The first activity carried out was to classify the characters contained in the material content analysis, problem analysis, and task analysis. Furthermore, the characters have identified the impact that occurs on students, both those with and without character values in the learning process. To support this, the researcher collects references relevant literature, and related journals.

We make sure that every source we use for our study is properly cited. When using protected content, we request authorization in accordance with copyright and intellectual property laws. By following these guidelines, we can be certain that the highest ethical standards are followed in the conduct of our documentation study research, which will benefit and responsibly advance our field of study.

3. Results

The results of analyzing material content, problem analysis, and project task analysis in the Physics Teacher Book class X 2013 curriculum can be seen in Table 1 below.

Table 1
Identification of Character Values in the 2013 Curriculum

Character	Analysis		
	Material content	Question	Task (Project)
Religious	page 168,179		
Honest	page 170,172,173,174,176,178,179	page 175	page 170,172,173, 174, 176,177, 178,179,180,181
Responsibility	page 170,172,173, 174, 176,177, 178,179	page 175, 179,181	page 170,172,173, 174,176,177,178,179,180,181
Tolerance	page 170, 172, 174, 175,176, 178,179	page 175, 179,181	page 170,172,173, 174, 178,179
Discipline	page 170, 172, 174, 175,176, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Hard work	page 171, 172, 174, 175,176, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Creative	page 170, 172, 173, 175,177, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Independent	page 170, 172, 173, 174, 175,177, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Democratic	page 170, 172, 174, 173,176, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Curiosity	page 170, 172, 174, 173,176, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Spirit of nationality			
Love the Motherland			
Appreciate Achievements			
Friendly / Communicative	page 170, 172, 174, 173,176, 178,179	page 175, 179,181	page 170,172,173, 174, 176,177,178,179,180,181
Love peace			page 170,172,173, 174, 176,177,178,179,180,181
Like to read	page 171,172,177, 178,179	page 175, 179,181	page 170,172,173, 174, 176, 177,178,179,180,181
Environmental care			
Social care			

It can be seen in Table 1 that the character values in the content analysis of the business and energy materials of the 2013 curriculum, the identified characters are religious, honest, responsible, tolerance, hard-working, creative, independent, democratic, curiosity, friendly/communicative, peace-loving, and like to read. There are also character values that are not identified in the content analysis, namely the character of the spirit of nationalism, love for the homeland, respect for achievement, care for the environment, care for the social hard-working, creative, independent, democratic, curious, friendly/communicative, peace-loving, and likes to read. There are also character values that are not identified in the analysis of questions, namely religious character, national spirit, love for the homeland, respect for achievements, care for the environment, and social care. Furthermore, in the project task analysis, business materials, and energy curriculum 2013 the identified characters are honest, responsible, tolerant characters, disciplined, hardworking, creative, independent, democratic, curious, friendly/communicative, love peace, and like to read. There are also character values that were not identified in the project task analysis, namely religious character, national spirit, love for the homeland, respect for achievements, care for the environment, and social care.

The results of analyzing the content of the material, analysis of questions, and analysis of project assignments. In the science teacher's book Class X, the independent curriculum can be seen in Table 2 below.

Table 2
Identification of character values in the independent curriculum

Character	Analysis		
	Material content	Question	Task (Project)
Religious	page 166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149
Honest	page 166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149,154
Responsibility	page 166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149,154
Tolerance	page 166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149
Discipline	page 166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149,154
Hard work	page 139, 143, 147,148,160,166	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149
Creative	page 139,148	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,149
Independent	page 148,160		page 144,145,149,154
Democratic	page 143, 149		page 144,145,155
Curiosity	page 139, 142, 143, 147,148,149,154,160	page 145, 146, 147, 150, 151, 152, 153, 156, 157, 161, 162	page 144,145,154,155,160
Spirit of nationality			
Love the Motherland			
Appreciate Achievements			Page 144,145,149,154,155,160
Friendly / Communicative	page 139		page 144,145,149,155,156,160
Love peace			page 144,145,155,160
Like to read	page 143, 147, 148,	Page 158,159,161,162	page 143, 145
Environmental care	Page 139, 142, 143,147,154,155	page 146, 147, 152, 156, 161, 162	Page 145,149,156,161
Social care	Page 142,143,166	Page 153	Page 144,145

Table 2 illustrates that the content analysis of the renewable energy material in the independent curriculum identified character values. These values include being honest, responsible, disciplined, hard-working, creative, independent, democratic, curious, friendly/communicative, peace-loving, fond of reading, environmental care, and social care. There are also character values that are not identified in the content analysis, namely religious character, tolerance, national spirit, love for the homeland, respect for achievement, creativity, independence, democracy, curiosity, likes to read, cares about the environment, and cares about society. There are also character values that are not identified in the questions, namely religious character, tolerance, national spirit, love for the homeland, respect for achievement, friendly/communicative, peace-loving, responsible, disciplined, hard-working, creative, independent, democratic, curious, appreciative of achievement, friendly/communicative, peace-loving, likes to read, cares about the environment, and cares about society. There are also character values that are not identified in the project assignments, namely religious character, tolerance, national spirit, and love for the homeland.

4. Discussion

Astalini, Darmaji, Kurniawan, D.A., Febriana, A., Qoidah, N.N., Azzahra, M.Z. & Triani, E. (2024). Analyzing character values in learning physics materials for the 2013 business and energy curriculum and the independent curriculum. *International Journal of Learning and Teaching*, 16(2), 45-56. <https://doi.org/10.18844/ijlt.v16i2.9130>

Character education in the current era of progress is very important to be taught and improved for present and future generations. This needs to be emphasized because character is the most basic aspect or foundation for life. After all, it is closely related to morals, norms, and attitudes. Character can be peddled in the family, social, and school environment. In schools, the learning process is the right way to direct students to the application of character education. In implementing a learning process, it is the goal of optimal goals by utilizing available natural and human resources (Li, 2021). Teaching and learning approaches have changed rapidly with the advent of technology (Khastini et al., 2021). The human resources referred to here are of course students, teachers, government, and parents. Meanwhile, supporting natural resources are environments that can be utilized in the realm of learning, especially physics. Physics is one of the important basic sciences and physics is useful for everyone (Çetin, 2016). This is because physics studies the natural sciences related to everyday life.

Physics tends to be considered a difficult subject because it is related to calculations, formulas, and theories that need to be proven by experiments or experiments. Physics subjects can be categorized in IPA (Natural Sciences). This division is carried out based on government policies and educational units that follow. In particular, physics subjects are divided into one of the educational curricula, namely the 2013 curriculum, while science which includes several subjects such as biology, chemistry, and physics is contained in the latest independent learning curriculum that is being developed. The character of students in the 2013 curriculum and the independent curriculum is applied the same, the only difference being that the portion of physics material in the 2013 curriculum is more detailed and the focus is only on physics material, while in the independent curriculum learning physics material, it is not comprehensive and merged with other subjects. Thus, in this study, there will be slight differences regarding the application of character education in the 2013 curriculum teacher books and the independent curriculum for class X learning and the effect of these characters on the Business and Energy material.

The 2013 curriculum and the independent curriculum play an important role as guidelines for designing student education improvements. In the 2013 curriculum and the independent curriculum, there are differences in the application of character values by educators to students. Judging from the description above in the 2013 curriculum, several characteristics are not instilled in students including the character of the spirit of nationalism, love for the homeland, respect for achievement, care for the environment, and care for the social. In the independent curriculum, several characteristics are not instilled in students, namely religious character, tolerance, national spirit, love for the homeland, and respect for achievement. In the two curricula that should be applied by educators to students, namely 18 characters only 13 characters are implanted, and 5 characters are not implanted. Even though 5 characters are not instilled in the two curricula, they have different types of characters.

4.1 Material content analysis

After the analysis, Table 1 and Table 2 are known about the differences in character values found in content analysis, problem analysis, and project assignment analysis. One of the important characteristics to be applied to students is creative character. Every citizen needs to develop his creative character (Maulana et al., 2022). For the application of creative characters, it is known that in the contents of the 2013 curriculum teacher's book on business and energy materials, the teacher invites students to explore how much effort and energy are expended. This makes students think creatively when observing the process and asking about the factors that influence the differences in the results. Furthermore, creative characters are also found in the independent curriculum, the teacher invites students to think contextually about safety cases when doing business. The character of responsibility is no less important in the learning process. According to Astuti & Mufrihah (2019), explaining the importance of the responsibility character module produced to improve independent student learning, the application of the character of responsibility in the 2013 curriculum is when the teacher directs students to be critically open in discussing and expressing opinions. While in the independent curriculum, students are directed to find the energy released, students are also directed to answer questions given by the teacher.

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The value of religious character in the matter of effort and energy is not found in the content of matter. The fact is that religion is the basic character of all proper characters. Religion describes every person whose nature is God's creation and made in His likeness, making humans have to obey and behave well according to his rules. Therefore, if humans do not have a religious character in the future, it will have an impact on arbitrary life with other people regardless of their equal position with His creation. In the 2013 curriculum and the independent curriculum, business, and energy learning materials if students are not directed to religious characters, students will act as they wish without following the teacher's directions. When starting the lesson which is included in the content of the material, students start it not by praying and not being grateful for the blessings of God who have allowed every student to study effort and energy well.

The next character value that is not found in the business and energy material in the 2013 curriculum teacher book is the love of peace. The peace-loving character reflects the unity and peace between humans as social beings. If students are not directed to the peace-loving character of the content of the material, then when in learning activities and the teacher explains the material, students will contact the class when explaining the formulation, students are disruptive to the class and create noise. The difference is in the teacher's book, the curriculum is free to study renewable energy materials that have a peace-loving character. This means that the independent learning curriculum contains development materials that have been revised from the previous 2013 curriculum.

4.2 Question analysis

Based on the results obtained in the class X class X's learning of business and energy physics, creative characters are only found in the independent curriculum book where students are directed to carry out activities in the form of working on questions, students must be able to think creatively in working on difficult questions. Furthermore, the value of the character of responsibility is also contained in the independent curriculum book. When students are given a mandate to work on practice questions, the character of responsibility will grow in students. Furthermore, the character that is not contained in the physics teacher's book 2013 curriculum and the independent curriculum is religious. In the question section, if students are not directed to the application of religious characters, students will be dishonest in working on the questions given by the teacher. Students will be based on gratitude because they have been allowed to work on questions that improve their ability to work on these questions. In the application of the peace-loving character that is not fulfilled in the 2013 curriculum teacher's book and the independent curriculum for studying business and energy materials, students when working on questions are not conducive to their friends or groups. Noisy, disturbing friends who are focused on studying and make the class atmosphere that should be quiet when studying become noisy and a lot of noise.

4.3 Project task analysis

Based on the results obtained in class X physics learning the matter of work and energy, creative characters are found in the 2013 curriculum book, while in its application students are given the task of exporting, where students will observe, ask questions, collect information, associate, and communicate. Furthermore, in the independent curriculum book, students are also given the task of observing and analyzing the group after which students will present the results that have been obtained. The character of responsibility is contained in the 2013 curriculum book and the independent curriculum. In its application to the 2013 curriculum, students are given independent assignments and group assignments, this will foster the character of responsibility in students. Likewise, in implementing the independent curriculum, students are also given activities in the form of tasks that must be done with a sense of responsibility by students.

In the 2013 curriculum, the fulfillment of religious characteristics has a good impact on the development of student's character when working on project assignments in the form of experiments or research outside the classroom. Students apply religious characters to business and energy materials so that the results obtained at the time of measurement are calculated and measured correctly without obstacles or miscalculations. Meanwhile, in the curriculum, the religious character of independence is not fulfilled which

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makes students encouraged to be dishonest in writing or presenting the results of the measurements and experiments they have done. Then, students are not grateful for God's goodness for making their project assignments successful and work well. Peace-loving character working on project assignments is fulfilled in the 2013 curriculum teacher's book and the independent curriculum which has a positive impact on students. Students become calmer and respect the needs of their friends who need a conducive atmosphere when taking measurements.

After analyzing the content of the material, questions, and project assignments in both curricula, this research was strengthened by previous research. Research on character education in the 2013 curriculum has been carried out previously. Iftanti & Madayani (2019), and Tohri et al. (2022) explained that Character education is also important to realize a peaceful and prosperous life as stipulated in the 2013 Curriculum. In the 2013 curriculum, it is applied in certain schools as a trial by implementing character education (Khojir et al., 2021; Rustan et al., 2018; Sánchez-Agustí & Miguel-Revilla, 2020). The purpose of education is to develop skills, knowledge, and character (Nuryana & Suyadi, 2019; Winarno, 2016; Yilmaz et al., 2021). It is well acknowledged that incorporating character education within the 2013 curriculum is crucial.

Research on character education in this independent curriculum has also been carried out previously by (Tohri et al., 2022; Isnaini et al., 2020; Rosala & Budiman, 2020) explaining that the development of national character is at the core of the dynamics of the nation that occurred in the course of history, both during the colonial period and during the independence period. Current education is education that adopts the 2013 curriculum and independent campus learning curriculum (Vhalery et al., 2022; Nuryana & Suyadi, 2019; Yudhar et al., 2021). Indonesia has implemented an independent education curriculum (Halek et al., 2021; Yudhar et al., 2021). This is what encourages the use of the 2013 curriculum to become an independent curriculum.

5. Conclusion

After analyzing the content of material, questions, and assignments in the textbook for physics teacher class X odd semester 2013 curriculum and physics teacher book class X curriculum independent learning, several differences can be seen regarding the achievement of character values in students. The difference is in the 2013 curriculum in the material content section and project assignments there are creative characters and responsibilities, but in the questions section there are no creative characters. Then the religious character in the 2013 curriculum and the independent learning curriculum in the material content section, questions, and project assignments were not fulfilled.

In the independent curriculum learning the peace-loving character is not fulfilled in the questions section and is fulfilled in the material content and project assignments section, while in the 2013 peace-loving character is only fulfilled in the project task section and is not fulfilled in the material and question content section. The impact of these characteristics is not fulfilled when learning physics will make students not have good and constructive characters themselves.

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