

The Teachings of Ki Hadjar Dewantara in Improving the Character of Elementary School Students in the Revolution of Industry 4.0 Era*

Ana Fitrotun Nisa
*Educational Science Primary
 School Teacher Education*
Universitas Negeri Yogyakarta;
Universitas Sarjanawiyata
Tamansiswa
 Yogyakarta, Indonesia
 ananisa@ymail.com

Zuhdan Kun Prasetyo
 Science Education
Universitas Negeri Yogyakarta
 Yogyakarta, Indonesia
 zuhdan@uny.ac.id

Istiningsih
*Islamic Primary School Teacher
 Education*
*State Islamic University Sunan
 Kalijaga*
 Yogyakarta, Indonesia
 istiningsih81@gmail.com

Abstract— Ki Hadjar Dewantara is the Father of Indonesian Education who was instrumental in carrying out an educational revolution in Indonesia from colonial-based to nationalist-based. The learning carried out puts forward the development of character that is balanced with the good mastery of knowledge. One of the teachings used by Ki Hadjar Dewantara in conducting the learning process is the trilogy of leadership and *tri nga*. The teachings are used as a balance between the knowledge students have and the character carried out in everyday life. These teachings can also enhance the students' characters which are very important in the revolution of industry 4.0 era, namely cooperative and proactive attitudes. This article aims to describe the implementation of the teachings of Ki Hadjar Dewantara in enhancing students' cooperative and proactive characters through science learning in elementary schools. By implementing Ki Hadjar Dewantara's teachings, the students' proactive and cooperative characters increase, which makes them able to adjust to the progress of the times.

Keywords: *leadership trilogy, tri nga, cooperative, proactive, revolution of Industry 4.0*

I. INTRODUCTION

The progress of the times requires education to always develop according to change. One of the adjustments to be made by education today is adjusting to the competencies students must have in the era of the revolution of industry 4.0. Education must respond to the development of competencies in this revolution of industry era with various strategies. If education does not respond well to these developments, the results will not be able to adjust to their environment and will gradually be left behind by

time.

There are four emergency realities faced by education today, namely the change in the ecology of learning for students and teachers, the ease of in and out of internet access, career and expertise differences, and teachers who encourage innovation both locally and globally [1].

One of the competencies that the students must have to adapt to various developments of the times including in the revolution of industry 4.0 era is the ability to cooperate with others and always be proactive in responding to what is in the surrounding environment. The good cooperation ability will make someone able to survive with a variety of existing differences and with a proactive character a person can capture all the opportunities that come to him so that he can live successfully in accordance with the times.

Some problems that occur if education cannot respond to developments include the students' difficulty in adapting to the working world, which requires them to have professional competence in each field. Many students find it difficult to get a job, which causes a lot of unemployment and affects the welfare and independence of a nation.

Indonesia is currently surprised by a variety of character problems such as corruption, riots, violent conflicts between ethnic groups, and other problems [2]. One of the causes of these is due to the lack of ability to adjust to someone (cooperation and proactivity) with the group where he is. These problems need to be solved through the learning process. One of the things that can be done by teachers is by integrating the learning process with good characters. This can work if the strategy or method used is appropriate. One way that can be used

This work was supported by the Doctoral Research Grant of Ristek Dikti 2019.

is to implement the teachings of Ki Hadjar Dewantara.

Ki Hadjar Dewantara is the father of education who has tried to maintain the spirit of character education as a factor that shapes the personality and identity of a nation (nationalist) [3], [4]. Some of the teachings of Ki Hadjar Dewantara that can be implemented to improve the proactive and cooperative characters are the trilogy of leadership (*ing ngarsa sung tuladha, ing madya mangun karsa, tut wuri handayani*) and *tri nga (ngerti ngrasa nglakoni)*. By implementing these teachings, learning can make students have proactive and cooperative characters, which can be used as a provision to survive and adjust to the revolution of industry 4.0 era.

II. LITERATURE REVIEW

A. Teachings of Ki Hadjar Dewantara

1. Leadership Trilogy

The leadership trilogy consists of *ing ngarsa sung tuladha, ing madya mangun karsa, and tut wuri handayani*. Initially, the leadership trilogy was only in the form of *tut wuri handayani*, which is also called *among* system, namely the learning process carried out in a family way. This system is used to support the nature of children to develop their life physically and mentally according to their own nature. Knowledge and intelligence should not be considered intent or purpose, but a tool. We should prioritize the flower, which will become fruit. The fruit of education is the maturity of the soul, which will be able to realize life and livelihood in an orderly and holy manner and benefit others. [4]

KHD makes *tut wuri handayani* as a motto of the *among* system which means recognition of individual autonomy to develop, but it is inevitable from the dialog or interaction with others including educators. The motto of *tut wuri handayani*, which was echoed by KHD, received a positive response from the RMP. Susrokatono (RA Kartini's older brother), a philosopher and linguist, by adding two more mottoes, namely *ing madya mangun karsa* (in the middle, arousing the will and motivating) and *ing ngarsa sung tuladha* (in the front, giving examples) [5]. The addition of these two mottoes makes *tut wuri handayani* not stand alone but become a leadership trilogy.

Ing ngarsa sung tuladha means that the leader (teacher) in the front should set an example [6]. Teachers are educators who must set good examples for students. He is a role model whose words and deeds must be obeyed and imitated [7].

Ing madya mangun karsa means that a leader (teacher) in the middle following the students must be able to motivate so that all can put together all their movements and behaviors simultaneously to achieve shared goals [6].

Tut wuri handayani, which comes from the word *tut wuri*, means to follow closely and responsibly based on love and affection that is free of interest and far from the authoritative, possessive, protective, and arbitrary permissive traits, and *handayani*, giving freedom or opportunity with attention and guidance that allows students to develop their own initiative and experience based on their nature [4].

The above explanation shows that the leader (teacher) must be able to give independence to his followers (students) with full attention to give instructions and direct them [6]. *Tut wuri handayani* also means that a teacher is an educator who constantly guides, gives encouragement and shows the right direction for students [7]. KHD also explains that *tut wuri handayani* was implemented in a kinship way rather than violence [4]. The teacher's attitudes and behaviors are *tut wuri handayani* in the form of giving freedom to students to develop self-confidence in themselves, the ability to stand on their own feet, both physically and mentally, and the courage to act at their own risk and personality according to their nature [8].

This leadership trilogy in its implementation is contextual. Its application depends on the circumstances, so that its benefits can be obtained optimally. To whom *ing ngarsa, ing madya* and *tut wuri* are applied depends on the quality of the uniqueness and the quality of the HR faced. In education, students have various uniqueness, both in the spirit or willingness to learn and in terms of their learning abilities. There are at least four groups of diversity of human qualities in terms of strength, willingness, and ability, namely for those who (1) are capable and have a strong will, (2) are capable but have less will, (3) have a strong will, but are less capable, and (4) are less capable and have less will. In order for efforts to foster human diversity to be effective, the coaching method is needed through appropriate assistance between *ing ngarsa, ing madya, or tut wuri* [9]; [10]. The implementation of the leadership trilogy is also adjusted to the age of the students. The age of 7-15 years is more towards *ing madya mangun karsa* while the age of 16-25 years is more towards *tut wuri handayani* [11].

Based on the explanation above, the leadership trilogy referred to in this study is a learning process carried out by adjusting to the HR uniqueness and quality of students in a *ing ngarsa sung tuladha* manner, in which in the front, the teacher gives and becomes a good role model to his students, in a *ing madya mangun karsa* manner, in which in the middle (among students) the teacher creates initiatives and ideas to foster spirit to always be proactive, creative, and cooperative, and in a *tut wuri handayani* manner, in which following from behind the teacher provides guidance, encouragement, and positive influence according to the characteristics of students, becomes humanist, and liberates children.

2. *Tri Nga (Ngeri, Ngrasa, Nglakoni)*

Tri nga is a teaching used to harmonize the knowledge possessed by students with the character they do in everyday life. This teaching is appropriate for teaching using mind (for students aged 7-14 years). Mind, feelings, and will must be trained altogether; otherwise, it is impossible to develop characters; (creation-feeling-will; *ngerti-ngrasa-nglakoni*). Children need to be habituated to behaving well. For children who can think, they should be given the necessary information to understand about good and bad in general. Thus, the requirements for character education which used to be called *ngerti-ngrasa-nglakoni* method (knowing, feeling and acting) can be fulfilled [4].

KHD teaches that character education is carried out through the stages of *ngerti, ngrasa, nglakoni*. This is in line with the view of Licona [12] that character education is carried out through the stages of knowing, feeling, and acting, which have the same meaning as *ngerti, ngrasa, nglakoni*. These three components are important in building character education, namely (1) moral knowing (knowledge about morals), (2) moral feelings (feelings about morals) and (3) moral actions (moral acts). These three things can be used as an implementative reference in the process and stages of character education in schools [13].

The targets that must be targeted in character education are (1) cognitive: filling the brain, teaching from not knowing to knowing, and cultivating the mind, so students can function their mind into intelligence. (2) Affective: relating to feelings, emotions, the formation of attitudes in one's personal self with the formation of an attitude of sympathy, antipathy, love, honesty and so forth. These attitudes can all be classified as emotional intelligence. (3) Psychomotor: relating to actions, deeds, noble behavior, communication and so on. Therefore, in the context of the 2013 curriculum, everything related to character education is important to be realized [14].

Tri nga is the implementation of someone who already has knowledge. If one already has knowledge (*ngerti*) about a thing, then he must have a sense of wanting to do things in accordance with the knowledge he has. Also, not only does he wants it (*ngrasa*), but he also should do (*nglakoni*) it from the knowledge he has. Suppose he knows how to be a scientist, the attitude he must have is honesty, self-confidence, discipline, and referring to facts. Then, the attitudes to do are to be honest, to be disciplined, and in referring to facts.

Ngeri method: the teacher has a duty to provide as much understanding as possible to students. In providing character education, a teacher must educate students about how to behave and act in a polite manner, pay attention to manners, and obey the rules. It is expected that along with their development

students can understand that bad deeds will only harm themselves. Through this *ngerti* method, KHD also invites students to learn about how to get along with their friends, community, and surrounding environment. It is to make them understand the true nature of life that, in addition to having a good relationship with their creator, humans must also have a good relationship with each other because a good relationship with each other is what will bring them in establishing a close relationship with their creator [7].

Ngrasa: asking students to make maximum efforts to understand, appreciate, and feel about all the knowledge they have mastered. KHD accustoms students to be able to account for everything they do. This attitude of responsibility can be used as a basis for forming students' mental attitudes, so that they grow into spiritually established humans [7].

Nglakoni is an effort to invite students to think about the good and bad effects before deciding to do something. If students already feel physically and mentally stable to do something, then they should immediately do it without delay. In this *nglakoni* stage, students are more emphasized to implement or apply what they have learned.

Based on the explanation above, the *tri nga* referred to in this study is an effort to develop aspects of the attitudes, knowledge and skills of children by educating their mind, feelings and will by making a habit of good behavior and explaining why they should do so. Learning is done by first performing *ngerti* stage: the teacher becomes a role model by being a good example of providing knowledge about the material being learned in accordance with the learning objectives, followed by the *ngrasa* stage, in which the teacher sharpens his feeling of understanding of what is understood through habituation. The next stage is the *nglakoni* stage, where the teacher accustoms students to do or apply what they have learned. Learning is also carried out continuously to foster attitudes that can inherent in students who then turn into habituation.

B. *Student Character*

1. *Proactive*

Proactivity is the individual ability to actively take the initiative to improve the situation or create new initiatives when others do nothing in dealing with various situations. Proactive individuals tend to be opportunistic, take initiative, dare to act and persevere until they achieve meaningful change. They also create positive changes in the environment regardless of limitations or obstacles [15].

Individuals who have a proactive personality tend to have characteristics in a task or job compared to passive ones. Proactive individuals can innovate with the design of their work. It means that individuals with higher proactive personality can see or feel higher work complexity [16].

The indicators of the proactive attitude in learning activities include, among others, 1) taking initiative in acting related to the task/work/social life; 2) able to use the opportunity (take advantage of existing opportunities); 3) motivated to move forward and develop; 4) focusing on things that may be changed/improved [16].

Based on the explanation above, the proactive attitude referred to in this study is the attitude integrated in the learning activities which are marked by 1) taking the initiative in acting related to the task/work/social life; 2) able to use the opportunity (take advantage of existing opportunities); 3) showing high enthusiasm during the learning process; and 4) able to express opinions in accordance with the existing context with confidence.

2. Cooperative

“Cooperation is defined as any adaptation that has evolved, at least in part to increase the reproductive success of the actor’s social partners” [17]. Cooperation is as mutual help which means working together with others to achieve shared goals by sharing tasks and help each other sincerely. Cooperative character is important for every elementary student to have because it can train them in understanding, feeling, and carrying out collaborative activities to achieve shared goals [18]. Also, cooperation can increase self-confidence and ability to interact and train students to adapt to new environments [19].

The indicators of cooperation include (a) able to respect others’ opinions, (b) participating in carrying out group activities in learning activities, and (c) interpreting the observation result together [20]. Based on the above explanation, the cooperative attitude referred to in this study is an attitude of cooperation integrated in learning activities characterized by (a) being able to respect the opinions of others and (b) participating in carrying out group activities.

C. Science Learning

Science learning in elementary schools is performed to provide students with knowledge about themselves, the environment and the natural environment. Science learning is also done to enable students to implement the knowledge they have in their daily lives by protecting, maintaining, and preserving the natural surroundings [21]. Science learning should be student-centered so that students truly experience what is learned to form knowledge in line with attitudes carried out in everyday life. Some

methods or strategies that can be done to activate children include problem-based learning, project-based learning, discovery learning, inquiry, and so on.

III. METHOD

A. Type of Study

This study is a descriptive-qualitative study, which describes the implementation of the teachings of Ki Hadjar Dewantara in elementary science learning.

B. Place and Time of Study

It was conducted at SD Rejowinangun 1 located at Jalan Ki Penjawi No. 12 Kotagede Yogyakarta. The time of the study was in August-September 2018 at the even semester of the 2018/2019 academic year.

C. Subject of Study

The subjects in this study were 24 fifth-grade students of SD Rejowinangun 1.

D. Data Collection Technique and Instrument

The techniques used in data collection include observation, interview and documentation. The observation technique was carried out to obtain the data on the implementation of the *tri nga* and the leadership trilogy teachings in the science learning process in elementary schools. The instruments used in the observation activities were the observation sheet of the learning process and the observation sheet of the improvement of students' proactive and cooperative aspects.

The interview technique was applied to obtain the data related to the implementation carried out by the teacher and students. The instrument used in the interview activity was an interview guide sheet containing questions asked to the teacher and students. The documentation technique was carried out to collect the necessary data such as photographs, changes and activities of the students and teacher in the learning process.

IV. RESULTS AND DISCUSSION

A. Results

This study was conducted three times with thematic learning process. The details of each lesson are explained as follows.

1. Learning 1

The results show that the proactive aspect is observed through the following indicators: (1) Taking initiatives in acting related to tasks/work/social life, which is seen during the activity with the criteria of (a) taking initiative in leading prayer at the beginning of learning without being told, (b) taking initiative to clean the classroom if the class looks dirty, and (c) helping other students who need help, for example when someone forgets to bring stationery, cannot operate teaching aids, and so forth;

(2) Able to use opportunities (take advantage of existing opportunities) with the criteria of (a) being serious in discussion activities, (b) being able to be a group representative to present the results of the discussion in front of the class, and (c) being able to ask if given the opportunity;

(3) Showing high enthusiasm during the learning process with the criteria of (a) asking questions or arguing when the teacher displays media in the form of air condition pictures, (b) having enthusiasm in working on the 5W1H question table, and (c) having a high enthusiasm in the question and answer activity with my classmates regarding the work in the question table;

(4) Able to express opinions in accordance with the existing context with confidence with the criteria of (a) giving an argument when the teacher asks about the condition of the air in the surrounding environment, (b) doing push poll after reading a text about the importance of air for our body, and (c) doing the question and answer activity after reading a text about the haze hazards for health and how to overcome it. The recapitulation of the assessment of proactive aspects can be seen in the following table.

TABLE I. RECAPITULATION OF PROACTIVE ASPECT ASSESSMENT IN LEARNING 1

Assessment Criteria	Number of Ratings for Each Indicator				Number
	1	2	3	4	
4 (Very Good)	3	4	-	-	7
3 (Good)	7	14	14	17	52
2 (Enough)	13	6	10	7	36
1 (Less)	1	-	-	-	1
Number	24	24	24	24	

Based on the above data, the score that most frequently appears is 3 with a good category of 52. This means that the proactive attitude of students on average is good, but there are still students who fall into the categories of *enough* and *less*. It means that teacher needs to provide more assistance.

The assessment of the cooperative aspects of learning 1 was conducted during the learning process with group discussion activities to discuss how to maintain the respiratory organs. The class was then divided into 6 groups with 4 students in each group. This group division aims to improve cooperative attitudes. Cooperation in groups in the learning process was integrated with discussions on how to care for human respiratory organ, presenting the results of the discussion, and practicum in making of human respiratory organs. During the practicum, each group was provided with tools and materials and student worksheets to conduct the experiment of making simple models of human respiratory organs.

Before the experiment was conducted, the students watched a video on how to make respiratory organs first to visualize the steps in the next experiment. This is as a form of motivating and providing knowledge

to students later in experimental activities. The recapitulation of observations of the cooperation aspect in learning 1 can be seen in the following table.

TABLE II. RECAPITULATION OF COOPERATIVE ASPECT IN LEARNING 1

Assessment Criteria	Number of Ratings for Each Indicator		Number
	1	2	
4 (Very Good)	4	-	4
3 (Good)	13	15	28
2 (Enough)	7	9	16
1 (Less)	-	-	-
Number	24	24	

2. *Learning 2*

The attitude aspects observed in the second learning were proactive and cooperative attitudes. These aspects were integrated in the activities of making posters with the theme of maintaining human respiratory organs, followed by the presentation session of the individually made posters. The proactive form of this learning activity was in the form of an attitude of respect for differences of opinion in making the persuasive term to maintain human respiratory organs as outlined in the poster. When the student's poster is different from another, the other students still respect the differences of opinion and remain enthusiastic about listening to the explanations of other friends.

This proactive attitude in learning 2 was integrated in the following activities: (1) Taking initiatives in acting related to tasks/work/social life with the indicators of (a) having the initiative to lead prayer without being told to, (b) take the initiative to clean the classroom if the class looks dirty, and (c) helping other students who need help, for example when someone forgets not to bring stationery, books and so on; (2) Able to use opportunities (take advantage of existing opportunities) with the indicators of (a) being serious in examining drawings and readings on persuading not to burn trash and recycling, (b) being able to be a group representative to present the results of the discussion in front of the class, and (c) being able to ask if given the opportunity;

(3) Showing high enthusiasm during the learning process by (a) asking questions or arguing when the teacher explains to invite not to burn trash and recycle, (b) being serious in looking at the story picture presented, and (c) being serious during the question and answer session about the features of the story picture; (4) Able to express opinions in accordance with the existing context with confidence during (a) *Ayo Berpendapat (Let's Argue)* activities based on the story picture presented, (b) question and answer activities after reading text of how to maintain the respiratory organs, and (c) presentation of the results of posters made. The following is the recapitulation of the assessment of proactive aspects in learning 2.

TABLE III. RECAPITULATION OF PROACTIVE ASPECT ASSESSMENT IN LEARNING 2

Assessment Criteria	Number of Ratings for Each Indicator				Number
	1	2	3	4	
4 (Very Good)	7	9	4	6	26
3 (Good)	5	9	13	12	39
2 (Enough)	11	6	7	6	30
1 (Less)	1	-	-	-	1
Number	24	24	24	24	-

The cooperative attitude was observed through the following activities: (1) Able to respect the opinions of others in (a) determining the theme for the story picture, (b) the activity of making a story for a story picture from a predetermined theme, and (c) filling in the sheets of *Ayo Berpendapat (Let's Argue)* about how to maintain the respiratory organs; (2) Participating in carrying out group activities in (a) providing input or ideas on how to maintain human respiratory organs, (b) listening/presenting the results of the discussion properly, and (c) the activity of making a story for a story picture from a predetermined theme. The following is the recapitulation of the assessment of the cooperative aspects in learning 2.

TABLE IV. RECAPITULATION OF COOPERATIVE ASPECT IN LEARNING 2

Assessment Criteria	Number of Ratings for Each Indicator		Number
	1	2	
4 (Very Good)	5	7	12
3 (Good)	16	10	26
2 (Enough)	3	7	10
1 (Less)	-	-	-
Number	24	24	

Increased proactive attitudes occur in students who have a high will or enthusiasm, so there are still only a few students who experience an increase in attitude. In the cooperative aspect to make stories for story picture materials, there are still several groups where only one or two students actively participated in making the story while the others were only watching.

3. Learning 5

The proactive aspects observed in learning 5 were integrated with the following criteria: (1) Taking initiatives in acting related to tasks/work/social life when (a) having the initiative to lead prayer without being told to, (b) taking the initiative to clean the classroom if the class looks dirty, and (c) helping others who need help, for example when someone forgets not to bring stationery, books and so on; (2) Able to use opportunities (take advantage of existing opportunities) when (a) being serious in examining drawings and readings on persuading not to burn trash and recycling, (b) being able to be a group representative to present the results of the discussion in front of the class, and (c) being able to ask if given the opportunity;

(3) Showing high enthusiasm during the learning process, when (a) showing the results of the posters that had been made at the previous meeting, (b) telling the content or message contained in the poster made, (c) listening to the teacher's explanation of the picture story, and (d) looking at the reading text about the steps to make a story picture;

(4) Able to express opinions in accordance with the existing context with confidence when (a) giving comments or opinions from posters made by other friends, (b) presenting the results of the story pictures made, and (c) doing learning process reflection activities. The following is the recapitulation of the assessment of proactive aspects in learning 5.

TABLE V. RECAPITULATION OF PROACTIVE ASPECT ASSESSMENT IN LEARNING 5

Assessment Criteria	Number of Ratings for Each Indicator				Number
	1	2	3	4	
4 (Very Good)	7	9	4	6	26
3 (Good)	5	9	13	12	39
2 (Enough)	11	6	7	6	30
1 (Less)	1	-	-	-	1
Number	24	24	24	24	

The cooperative aspects in learning 5 were integrated in the following activities: (1) Able to respect others' opinions in (a) determining the theme for the story picture, (b) the activity of making a story for a story from picture from the predetermined theme, and (c) filling in the sheet of *Ayo Berpendapat (Let's Argue)* on how to maintain the respiratory organs; (2) Participating in carrying out group activities in (a) preparing tools and materials for making story pictures, (b) making story pictures, and (c) presenting the results of the story pictures made. The following is the recapitulation of the assessment of the cooperative aspects in learning 5.

TABLE VI. RECAPITULATION OF COOPERATIVE ASPECT IN LEARNING 5

Assessment Criteria	Number of Ratings for Each Indicator		Number
	1	2	
4 (Very Good)	7	9	16
3 (Good)	5	9	14
2 (Enough)	11	6	17
1 (Less)	1	-	1
Number	24	24	

Based on the data above, the recapitulation of the assessment of attitude aspects of each meeting, the data obtained are as follows.

TABLE VII. RECAPITULATION OF ATTITUDE IMPROVEMENT

Meeting	Aspect	
	Proactive	Cooperative
1	2.677	2.75
2	2.937	3.0416
5	3.1354	3.3125
Mean	2.916 (Good)	3.034 (Good)

Based on the explanation above, it can be concluded that the proactive and cooperative characters have increased in each learning. Therefore, the teachings of the leadership trilogy and *tri nga* are effective in improving the learning outcomes of the attitude aspect.

B. Discussion

The results of the above study show that the teachings of Ki Hadjar Dewantara in the form of a leadership trilogy and *tri nga* can improve the proactive and cooperative characters. This happens because the teacher can facilitate students in accordance with the characteristics of each individual by implementing the teachings of the leadership trilogy. In the implementation, the teacher facilitates students in accordance with the characteristics of each student. For example, for the students who are in a state of high will and high ability, the teacher only supervises (*tut wuri handayani*). If they experience difficulties or errors, the teacher guides them or tells the truth. If the students are in a high will, but low ability state or vice versa, the teacher gives encouragement or enthusiasm according to their own needs (*ing madya mangun karsa*). When the students are in a low ability and will state, the teacher must give more examples (*ing-sung sung tuladha*) for them to imitate and follow what must be done.

The statements above are in accordance what is conveyed by Anggadiredja that the level of degradation in the implementation of the trilogy learning at elementary school age (7-12 years) is dominated by the teachings of *ing ngarsa sung tuladha* and *ing madya mangun karsa* [11]. This stage is called the stage of nature by KHD. At this stage, character education should be carried out by providing understanding related to good behavior in daily life. The purpose of character education is to maintain order in life to achieve a sense of inner peace, both regarding one's own life and the life of the community [4].

The analysis of student characteristics was also carried out in order to determine the strategies, models, and learning methods used. In accordance with Piaget's theory, children aged 7-12 years fall into the category of concrete operational stages [22]. This shows that learning must be supported by learning media as a tool to concretize the learning object being studied. For example, when students will do an experimental activity, the teacher first plays a video sample of the experimental activities so that they have a picture of the activities to be carried out. The activities carried out by students are examining, recognizing, marking, observing, comparing or observing learning objects learned by using all five senses in the form of video playback of experimental examples to make models of human respiration.

The implementation of the teachings of Ki Hadjar Dewantara (specifically the leadership trilogy and *tri nga*) in the of elementary school science learning is also adapted to the current curriculum, the 2013 curriculum. The learning carried out emphasizes not

only the aspects of knowledge but also attitudes and skills. This is the implementation of what has been explained by the KHD that knowledge and intelligence should not be considered as an intent or purpose, but instead be made as a tool. We should prioritize the flower, which will become fruit. The fruit of education is the maturity of the soul, resulting in orderly and holy life and livelihood and benefiting others. Integration between the aspects of knowledge and attitude can reduce the problems of materialism, intellectualism and egoism in students [4].

Based on the explanation above, it can be concluded that the teachings of Ki Hadjar Dewantara are still relevant and can be implemented well in the science learning process in improving proactive and cooperative characters. These attitudes are very important for students to have to adjust to the times, including in the revolution of industry 4.0 era.

ACKNOWLEDGMENT

We would like to express our gratitude to Ristek Dikti which has provided funding through the Doctoral Dissertation Research Grant 2019.

REFERENCES

- [1] Barnett Berry, Teaching 2030: what we must do for our students and our public school-now and in the future, New York: Teachers College Press, 2011.
- [2] Budi Mulyadi, Model pendidikan karakter dalam masyarakat Jepang. *Jurnal IZUMI*, 3(1), 69-80, 2014.
- [3] Linda Unsriana dan Rosita Ningrum, The character formation of children in Japan: A study of Japanese children textbook on moral education (doutoku). *Lingua Cultura*, 12(4), 363-367, 2018. [DOI.org/10.21512/lc.v12i4.4270](https://doi.org/10.21512/lc.v12i4.4270)
- [4] Ki Hadjar Dewantara, Pemikiran, konsepsi, keteladanan, sikap merdeka (I) Pendidikan, Yogyakarta: Majelis Luhur Tamansiswa, 2013.
- [5] Dwi Siswoyo, "Ki hadjar dewantara peletak dasar pendidikan nasional" in Dwi Siswoyo, et al. Ilmu Pendidikan. Yogyakarta: UNY Press, 2013.
- [6] Darsiti Soeratman, Ki hajar dewantara. Jakarta: Education and Culture Department. Proyek Pendidikan sejarah perjuangan bangsa. 1985.
- [7] Haidar Musyafa, Sang guru novel biografi ki hadjar dewantara kehidupan, pemikiran, dan perjuangan pendiri tamansiswa (1889-1959, Jakarta: Imania, 2015.
- [8] Soeratman, Pola pendidikan tamansiswa, Yogyakarta: Majelis Luhur Tamansiswa, 1983.
- [9] Djohar dan Istiningsih, Filsafat Pendidikan Ki Hadjar Dewantara Dalam Kehidupan Nyata, Yogyakarta: Lentera, 2016.
- [10] Paul Hersey dan Kenneth H Blanchard, Manajemen perilaku organisasi: pendayagunaan sumber daya manusia. Fourth edition. Ahli bahasa: Agus Dharma. Jakarta: Erlangga, 1997.
- [11] Jana Tjahjana Anggadiredja dkk, Kursus Pembina Mahir Tingkat Dasar, Jakarta: Kwartir Nasional Gerakan Pramuka, 2011.
- [12] Thomas Licon, Educating for character, how our school can teach respect and responsibility. Newyork: Bantan Book, 1991.
- [13] Slamet, Nilai-nilai ketamansiswaan. Makalah disampaikan pada acara prajabatan dosen UST pada tanggal 22/5/2015.
- [14] Sudarmin, Pendidikan karakter, etnosains dan kearifan lokal (konsep dan penerapannya dalam penelitian dan pembelajaran sains, Semarang: FMIPA UNNES, 2018.

- [15] Steppen P Robbins, Perilaku organisasi: konsep, kontroversi, aplikasi, Chapter I, Edition 8, Jakarta: Prenhallindo, 2001.
- [16] Baek Kyoo Joo dan Taejo Liem, The effect of organizational learning culture, perceive Job Complexity and proactive personality on organizational commitment and intrinsic motivation. *Journal of leadership & organizational studies*. 16 (1), 48-60, 2009.
- [17] Dean J Champion, "Basic For Social Research", Second edition, New York, MC Milton Publishing Co, 1984.
- [18] Rukiyati, Nany Sutarini dan Priyoyuwono, Penanaman nilai tanggungjawab dan kerjasama terintegrasi dalam perkuliahan ilmu pendidikan. *Jurnal pendidikan*. IV (2), 35-49, 2014.
- [19] Silvy Dwi Yulianti, Ery Tri Djatmika dan Anang Santoso, Pendidikan karakter kerjasama dalam pembelajaran siswa sekolah dasar pada kurikulum 2013. *Jurnal teori dan praksis pembelajaran IPS*. 1(1), 33-38, 2016.
- [20] Tursinawati, Analisis kemunculan sikap ilmiah pada rubrik penilaian sikap sub tema macam-macam sumber energi di kelas IV sekolah dasar. *Educhild*. 6 (1), 1-8, 2017.
- [21] Sri Sulistyorini, Model pembelajaran IPA sekolah dasar dan penerapannya dalam KTSP, Yogyakarta: Tiara Wacana, 2007.
- [22] Jean Piaget, Tingkat Perkembangan Kognitif, Jakarta: Gramedia, 2002.