Suggestions on Teaching and Learning AI Ethics using Cooperative Learning Method in Elementary and Secondary Education

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Abstract

Purpose: Discussions on AI Ethics Education is still unfolding without a clear direction set in terms of its nature, goals, teaching and learning methods, etc. In particular, teaching and learning of AI Ethics Education needs to be discussed in the methodological aspect of effectively delivering new contents of Applied Ethics to students. With this in mind, the purpose of this study is to explore teaching and learning that can effectively implement AI Ethics Education, and to propose a method that can be applied to Elementary and Secondary Education.

Method: This study intends to utilize the methods of literature studies and comparative studies. First of all, using literature research method, we will examine recent discussions related to AI Ethics Education. In addition, using comparative research method, we will compare and review the system of Ethics Education currently in place in Elementary and Secondary Schools and the system of AI Ethics education that is the subject of discussion. The above research method will contribute to clarifying the unique characteristics of the teaching and learning of AI Ethics Education presented through this study.

Results: AI Ethics education could be said as an order about the relationship between humans and AI. At this time, AI Ethics Education needs to go in the direction of establishing a relationship of mutual cooperation rather than mutual checks between AI and humans. Building a community between AI and humans, and practicing a Cooperative Relationship in that community, should be developed through school education which is a professional activity of education. To this end, it is necessary to understand the nature of Teaching and Learning especially in AI Ethics Education, and to construct and implement appropriate teaching and learning methods.

Conclusion: Teaching and learning of Ethics Education specialized in AI Ethics Education can be divided into those that target AI and those that target Elementary and Middle School Students. At this time, the target of AI Ethics Education through School Education will be primarily adolescent students attending Elementary and Secondary Schools. However, in their Ethics Education Teaching and Learning, AI can perform the functions of others or peers who have important influence. Therefore, it is proposed to develop and apply Teaching and Learning Method of Cooperative Learning that constitutes ethical AI, and enables such ethical AI to function as a subject of cooperative Learning in AI Ethics Education through Elementary and Secondary Education.

[Keywords] Artificial Intelligence, AI Ethics Education, Elementary and Secondary Education, Moral Education, Teaching and Learning

1. Introduction

The perspectives contained in the recent discussion on AI can be divided into negative and positive aspects. According to the negative view, AI is considered to expand dehumanization, inequality, and various other problems caused by technological advancement. There are some representative examples of this negative view especially in relation to the area of education, such as a study on the academic burnout that occurs when adolescents in the elementary school...
stage are excessively addicted to smartphones[1], a study on learning behaviors in relation with online learning of university students under the COVID-19 crisis situation[2], a study on the current status of juvenile cyber verbal abuse and response methods[3], and so on.

On the other hand, according to a positive view, AI is believed to be a tool to guide the world we live in to become more just and fairer. In relation with education field, there are examples of such a positive view as follows: a study linking the gamification model and flipped learning[4], a theoretical exploration of the necessity of AI Ethics education that develops with the advent of AI[5], and AI's rules of engagement in relation to future warfare studies on the way to design instruction systems to reflect Ethics[6], etc.

These two perspectives are based on the premise that it is the most ideal for AI and humans to form a cooperative relationship. A positive perspective implies that it is necessary to capture the positive viewpoints of AI and encourage them to form cooperative relationships with humans. On the other hand, from the negative perspective that focuses on flaw or fault, it implies that various efforts should be made to closely observe the negatives of AI and to control it.

AI develops and improves its capabilities over time. However, AI itself is not smart enough. The reason is that in AI, reasoning ability as cognitive intelligence develops rapidly, but various abilities related to emotional intelligence are still slowly developing. The developmental direction of AI is that it extracts the core part of human ability, and then the AI learns it. From this point of view, it is the core of the activity to educate Ethics to AI that comprehensively checking the various aspects of human intelligence and the reality of its actions.

Human intelligence is composed as in very complex ways. In particular, from the perspective of the Ethics Education, moral reasoning and critical thinking as a higher order of thinking skills are treated as important. Together with this, in the emotional aspect, such that compassion, curiosity, creativity, and collaboration are emphasized. This study intends to focus on the aspect of collaboration among these various factors. Collaboration is based on the interaction of students as members of small or proper sized groups. However, this interaction has the characteristic of bringing you closer to the essence of learning. Learning is not limited to the process of fully digesting and remembering some particular information. In other words, learning means understanding, applying, and reflecting on what has been learned at a significant level.

On the other hand, learning is understood to be a very individual activity in that it takes place through the internal cognitive process of an individual learner. However, in reality, this learning continues through communication with other learners, including language, and interaction with the environment. As the content of learning acquired through this process, the information itself contains value. And by using this information, functional and mental representations that can be applied to various situations are created. This situation presupposes the various relationships formed with the other actors, so it leads to a request for cooperative activities.

In terms of cooperative activities, learning can be said to be a skill that helps people develop mutually compatible competencies and form and acquire appropriate habits. It is also an activity in which people set specific common goals in a small community, and build and modify attitudes and behaviors toward them. Therefore, learning becomes an activity that equips learners with the skills necessary to develop their competency and adapt to the surrounding environment set in the community. Looking at this from the AI Ethics' point of view, it needs to be embodied as a prospect for learning through cooperative activities between humans and AI.

Based on these discussions, this study will first compare and review the two perspectives of AI Ethics Education, the one which centers on traditional ethical theory, and the other that focuses on new subjects of Applied Ethics which have emerged due to AI. Next, we would like to examine the nature and goals of AI Ethics Education in the school field. Next, among the cooperative learning methods, we would like to explore the appropriate method to apply to AI Ethics
education or the method of AI Ethics education through the cooperative learning method. Lastly, I would like to propose a method that can be applied to AI Ethics education in elementary and secondary education fields.

2. The Nature and the Contents System of the AI Ethics Education

The nature and content system of AI Ethics education can be embodied by revealing the existence of humans in the essence of AI Ethics and exploring the principles of content composition of AI ethics Education.

2.1. The nature and characteristics of the AI Ethics education

AI in the educational system has unique characteristics. On the one hand, it is approached as an education on AI itself as a content of general education and an exploration of the educational impact of AI. Examples of research related to this approach include The Effect of Artificial Intelligence and Child Life Guidance Subject on Pre-Service Teachers[7]. On the other hand, an approach is made in terms of preparation and prediction for the education that will be developed using AI and media as tools in the context of future education. As a study related to this approach, the case of research materialized as a method of smart learning based on media[8] is one of the example. Recently, along with this approach, research that directly targets AI Ethics itself has been actively conducted. A representative example of this approach is a study that analyzed the formation of Ethics that AI should have as an artificial moral agent from the viewpoint of virtue Ethics from two perspectives: top-down and bottom-up[9].

Underlying the various discussions above is a certain shared understanding of AI Ethics. This understanding is based on considering Al Ethics as an issue which is related to the development of science and technology, and that the solution cannot be left solely to individual ethical practice. If AI Ethics can be approached in terms of Social Ethics, it can also be related to national or government policies. Then, it is understood that AI Ethics can be approached from the perspective of technological innovation and policy innovation. Summarizing the above discussion, among the various attributes of AI Ethics, the understanding of universal social norms and related technologies that various stakeholders related to artificial intelligence must comply with are included. In this case, stakeholders include both humans and AI as subjects and objects of AI Ethics. And from this point of view, AI Ethics Education is analyzed from two aspects: conducting Ethics Education to AI and conducting Ethics Education to human subjects living with AI. A detailed look at this is as follows:

First, educating Ethics to AI contains a view that teaching and learning traditional Ethics or ethical theory for/of human as an important focus of AI Ethics education. This perspective means that AI learns the principles and procedures of ethical judgment suggested by traditional ethical theory. In this process, AI learns the core contents of ethical theory and performs activities that imitate human's complex ethical reasoning and judgment abilities by learning about the applied cases. At this time, machine learning and deep learning which the core technologies of AI, will actively work.

Second, humans learn ethical principles that emerge as humans form a relationship with AI. This corresponds to one of the new themes of Applied Ethics, which means exploring new considerations that emerge in the process of applying ethical theory to real problems. In this process, AI presents various matters to be considered in the process of human ethical reasoning and judgment, and performs simulation activities for the results that will be caused by the ethical judgment when a specific ethical judgment is made.

These two activities formally establish two parties, humans and AI. But in reality, they can be said to be mechanisms in which humans act as subjects. The main topics of discussion in the
mechanisms related to learning AI Ethics are as follows: Whether to apply the traditional ethical order that arises from relationship among human beings to the relationship between humans and AI, or the relationship between humans and AI. It is whether humans will learn the new ethical order that arises from within. What is noteworthy in this discussion is that the core of these two dimensions is the human being. In other words, humans are at the center of the debate about whether humans will deliver an ethical order to AI or whether humans will accept a new ethical order from AI.

These two activities are not mutually articulated, but rotate and influence each other. In other words, as AI learns the existing ethical order, the AI approaches, analyzes, and infers various new issues from an ethical point of view. And by sharing the results of this reasoning with humans, applying ethical theory to new phenomena that expands the horizon of Applied Ethics. Loop back of Interaction Mechanism of AI Ethics Education between Human and AI like this could be shown in Figure 1.

**Figure 1.** Interaction mechanism of AI ethics education between human and AI.

2.2. The contents system composition principle of the AI Ethics education

The principles and methods of composing the content system of AI Ethics Education can be variously suggested as follows in accordance with the setting of the standards:

First, the most basic approaches that a classification method focusing on humans as the subject of education on AI Ethics. At this time, AI Ethics Education is divided into following two aspects: the one is that Ethics necessary for people who use AI in terms of human activities directly related to AI, and Ethics necessary for people who make AI. The other is that in terms of human activities that are indirectly related to AI, it is possible to approach the Ethics necessary for all humans as a way to relate to AI.

Second, a classification method centered on actors including individuals and legal entities as subjects in response of issues on AI Ethics. In detail it is as follows: Actors in Business Sector explore and practice AI Ethics as a social responsibility of corporation or business, Actors in Academic Circles design and operate interdisciplinary research programs on Ethical Issues related to AI technology and social systems, Government Administration establish basic principles for intelligent information service and suggest guidelines for joint efforts to protect users.

Third, a classification method that presents principles for AI Ethics. This is developed in the form of presenting the opportunities related to the use of AI by contrasting its risks, and presenting a kind of declarative principle to respond to problems that occur when this is overused or misused. Among these kinds of research, there is a study that proposes Ethical Framework...
for a good AI society[10]. This study understands the four elements as opportunities of using AI, such as enabling human self-realization, enhancing human agency, increasing societal capabilities, and cultivating social cohesion. And to promote this opportunities, the four principles of bioethics are introduced and utilized along with Beneficence, Non-maleficence, Autonomy, and Justice. With those, Explicability is proposed as a new enabling principle.

Fourth, there is a method to approach by extracting specific sub-elements requested in AI Ethics. The extraction of these sub-elements can be developed in a way that explores the virtues of AI Ethics by using various quantitative and qualitative research methods. Notable research in this regard is that AI develops and proposes AI Code of Ethics by actively utilizing AI’s learning mechanism[11]. This study explains that various situations and information that require ethical discussion should be broadly established based on big data. And based on this, it is proposed that the factors and principles to be considered in ethical judgment should be extracted and presented by using AI machine learning and deep learning technology. And this study also suggests that for ethical decisions made in accordance with these extracted principles, a procedure for Human Ethics Experts to evaluate their acceptability is needed. These procedures are also related to how to conduct AI training using AI as a tool[12]. The following <Table 1> summarizes the representative approaches as described above.

**Table 1.** Principles and methods of content system composition of AI ethics education.

<table>
<thead>
<tr>
<th>Criteria of Classification</th>
<th>Principle and Methods</th>
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<tbody>
<tr>
<td>Humans as the subject of AI Ethics education</td>
<td>Human activities directly related to AI</td>
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<tr>
<td></td>
<td>- Ethics needed for people who use Artificial Intelligence</td>
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<td></td>
<td>- Ethics for those who design Artificial Intelligence</td>
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<td></td>
<td>Human activities indirectly related to AI</td>
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<td></td>
<td>- General ethical principles arising from the relationship</td>
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<td></td>
<td>between humans and AI</td>
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<tr>
<td>Actor-centered classification as the subject of</td>
<td>Actors in Business Sector</td>
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<tr>
<td>response to AI Ethics: including both individual</td>
<td>- Exploring and Practicing AI Ethics as a Social Responsibility of Corporation or</td>
</tr>
<tr>
<td>and legal entity</td>
<td>Business</td>
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<td></td>
<td>Actors in Academic Circles</td>
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<td></td>
<td>- Design and operation of interdisciplinary research programs on Ethical issues</td>
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<td></td>
<td>related to AI technology and social systems</td>
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<td></td>
<td>Government Administration</td>
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<td></td>
<td>- Establishing basic principles for intelligent information service and Suggestions</td>
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<td></td>
<td>of guidelines for joint efforts to protect users</td>
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<tr>
<td>Presenting Principles for AI Ethics: based on</td>
<td>Four Principles that could be applicable to AI Ethics</td>
</tr>
<tr>
<td>Principles of Biomedical Ethics</td>
<td>- Beneficence</td>
</tr>
<tr>
<td></td>
<td>- Non-maleficence</td>
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<td></td>
<td>- Autonomy</td>
</tr>
<tr>
<td></td>
<td>- Justice</td>
</tr>
<tr>
<td>Extract and approach the specific sub-elements</td>
<td>Additional Principles Required in AI Ethics</td>
</tr>
<tr>
<td>requested in AI Ethics</td>
<td>- Explicability</td>
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<td></td>
<td>Research Activities of Human Researchers</td>
</tr>
<tr>
<td></td>
<td>- Factor Analysis of AI Ethics Using a Quantitative Approach</td>
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<td></td>
<td>- Exploring the Content Elements of AI Ethics Using a Qualitative Approach</td>
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<td></td>
<td>Activities that allow AI to extract content elements of AI Ethics</td>
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<tr>
<td></td>
<td>- Extraction of data and principles of ethical judgment based on big data using</td>
</tr>
<tr>
<td></td>
<td>machine learning &amp; deep learning technology</td>
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<tr>
<td></td>
<td>- Evaluation of Human Ethics Experts on the acceptability of ethical decisions</td>
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<tr>
<td></td>
<td>based on extracted data and principles</td>
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</table>
3. Applying Cooperative Learning Method to AI Ethics Education

The application of Cooperative Learning Methods in AI Ethics Education can be approached from two aspects. First, reviewing the developmental direction of AI Ethics Education and analyze the status of Cooperative Learning among them. Second, methodological understanding of AI Ethics Education using cooperative learning in terms of teaching and learning methods.

3.1. Developmental direction of AI Ethics education and the status of cooperative learning

Education is a professional activity, and the goal of education, content of learning, and teaching and learning methods should be different depending on the subject to be educated. The current status of various types of education related to AI consists of encompassing all aspects of AI-related education contents and methods. However, such AI-related education needs to be differentiated from that conducted at home or in the general society and reflect the characteristics of AI education through school education. On the other hand, education in schools is composed of various subjects, and among them, AI Ethics-related contents are mainly dealt with through Moral Ethics subjects. Therefore, as a sub-content element of the Moral and Ethics course, AI Ethics education has its own content and system. Considering this flow, the direction of AI Ethics education can be understood as shown in <Figure 2> below. This is an explanation of the process in which AI Ethics education is taking shape.

Figure 2. The process of refining AI ethics education in the educational system.

In this system, the discussion on AI Ethics education takes place at the sub-element level of Ethics Education. Various factors are related to this as such: first, there is an analysis of factors related to the instructor. For this, discussions related to the faculty in charge of AI Ethics education[13] could be an example. Second, various topics related to AI Ethics are discussed in a fused form. There are researches dealing with AI Ethics while reimagining medical education in the AI era[14]. Third, studies that understand and approach AI itself as an existential being that performs ethical actions. This research triggers discussions on issues of regarding AI as an Artificial Moral Agent[15]. Fourth, there is a study that implements a decolonial approach to AI through the teaching and learning of Ethics against digital neocolonialism in the realm of higher education[16].

The above themes and approaches can be said to presuppose that AI should ultimately pursue the good in terms of justification of AI’s own existence. This orientation also suggests that AI itself can perform practical roles and functions as a force pursuing good[17]. Considering this point, the sub-themes of AI Ethics education are presented in a very diverse way and are evolv-
ing. In particular, these topics regards Ethics as a kind of service and are treated from the perspective of pragmatic operation[18]. This approach is also partly connected with the view that Ethics are inherent in the development of AI[19].

Despite the fact that the topic of AI Ethics is being discussed in a form that actively encompasses various factors, the discussion on the principles of AI Ethics is approached from a contradictory point of view. One is the viewpoint of solving problems related to AI ethics by establishing certain principles. Related to this point of view, there is a case of research to build-up and operationalize AI ethics principles[20]. Another view is that the establishment of principles alone cannot solve problems related to AI ethics. This means that an alternative approach should be taken other than the establishment of principles, and studies that point out the lack of proven methods to translate principles into practice as a problem[21] are representative in AI development.

If certain ethical principles exist, education is needed to take them into practice. If this is understood in relation to AI Ethics, such education is judged to be possible by actively introducing the method of Ethics Education. In particular, Ethics Education can be more effective when it is done through an ethical method. Considering these points, activities that allow humans and AI to form a single community to achieve the common learning goal of AI Ethics are a form of ethical method to increase the effectiveness of AI ethics education. Therefore, it is necessary to take a more in-depth look at the method of AI ethics education using cooperative learning.

3.2. Methodological understanding of AI Ethics education using cooperative learning

The concrete process of AI Ethics education in the educational system requires detailed discussion related to the content and system of AI Ethics education. It can be developed in two directions: On the one hand, the contents of AI Ethics education are, the application of traditional ethical theory to the development of science and technology embodied by AI and consequent social changes. On the other hand, the new Ethics that emerge due to the development of AI. Regardless of which of these two aspects, the application of traditional ethical theories and the exploration of new ethical theories, the discussion about AI Ethics education in the context of school education is a way to effectively convey the new content of Applied Ethics named AI Ethics to students.

This study proposes AI Ethics education using Cooperative Learning as a point of contact between the application of the currently used Ethics Education methodology and the educational methodology of AI Ethics that can be newly developed and applied in relation to AI. Cooperative Learning has characteristics similar to inquiry classes, which emphasizes the role of the teacher as a facilitator. However, the Cooperative Learning model has characteristics in that students are given discretion over overall task performance, that task performance is always carried out in a team, and that collaboration itself is treated as valuable. This can be confirmed through the fact that the core of cooperative learning emphasizes team-level collaboration while the core of inquiry class deals with questions as the core of learning.

Cooperative learning is distinct from group study, in which students are divided into small groups. Group study is optionally collaborative. However, in Cooperative Learning, collaboration is essential. That is, in a group study, a given task can be solved even if there is no cooperation. However, in the Cooperative Learning environment, the task can only be completed through cooperation. Thus, Cooperative Learning aims to enable students to cooperatively solve tasks in a high-level interdependent relationship, and has the advantage of enabling various learning strategies in that they teach and learn while helping each other[22][23]. The strategy of classroom instruction for cooperative thinking and learning can be embodied through the use of both cooperative and collective methods in teaching and learning. The relationship between Cooperative Learning and Collaborative Learning is as shown in <Figure 3>.
Such cooperative learning is characterized by elements such as positive interdependence, individual accountability, equal participation, and simultaneous interaction\[24][25]. Applying this characteristics to AI Ethics education where AI and humans interact, it can be understood as follows.

First, positive interdependence means that members learn together in order to achieve a common learning goal. This means that in learning, individual success and community success must be combined to achieve results. This means that the relationship between human learners and AI should be organically constructed so that the success of human learners in learning can lead to practical success in learning of AI. For this, learning must be structured so that human learners and AI can share learning goals by giving unique roles, tasks, and materials that can be performed to human learners and AI constituting the community. In particular, one-for-all, all-for-one learning should be achieved by intentionally assigning incomplete tasks to each human learner and AI and sharing detailed roles in the performance process.

Second, individual accountability means suggesting specific roles for individual learners and holding them accountable so that they do not hide themselves in the group during the learning process. This means that the device should be designed to fully reflect the contribution of the individual to the role. Giving such individual responsibility serves to stimulate the learning motivation of human learners and increase their self-esteem. When human learners and AI perform tasks together, human learners naturally fall into the temptation of free-riding. In order to prevent this phenomenon, the active participation of human learners can be encouraged by sufficiently reflecting the contribution of the individual to the role.

Third, equal participation means giving everyone equal opportunities to participate in learning activities. This means that the emotional characteristics of human learners should be considered and reflected in the learning community that human learners and AI together constitute. Human learners have psychological and emotional internal characteristics that distinguish them from AI. That is, there are extroverted learners who have excellent presentation skills, while there are introverted learners who lack presentation skills. Due to these individual differences, it is necessary to make an effort to ensure that the individuality and ability of each existing student is sufficiently considered in the process of cooperative learning with AI.

Fourth, simultaneous interaction means that the disadvantages of sequential or simultaneous learning must be overcome and structured so that members can freely interact. When human learners and AI perform learning activities together, the learning mechanism should be structured so that all learners can control themselves according to time rather than order. This aims to prevent such a problem from occurring because learning is hindered when one learner's presentation or learning activity waits for another learner's learning activity. As the following
<Table 2> summarizes Considerations in AI Ethics education with AI and Human Cooperative Learning as described above.

Table 2. Considerations in AI Ethics education with AI and human cooperative learning.

<table>
<thead>
<tr>
<th>Consideration Factors</th>
<th>Meanings and Contents</th>
</tr>
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<tbody>
<tr>
<td>Positive Interdependence</td>
<td>- Organizing the success of human learners and the success of AI become one in learning</td>
</tr>
<tr>
<td></td>
<td>- Share learning goals among human learners and AI through structured learning</td>
</tr>
<tr>
<td>Individual Accountability</td>
<td>- Assign specific roles and responsibilities to individual learners</td>
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<tr>
<td></td>
<td>- Encourage active participation of human learners by ensuring that their contribution to the role is fully reflected</td>
</tr>
<tr>
<td>Equal Participation</td>
<td>- Equal opportunity for everyone to participate in learning activities</td>
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<tr>
<td></td>
<td>- Reflecting the psychological characteristics of human learners (e.g. extraversion, introversion)</td>
</tr>
<tr>
<td>Simultaneous Interaction</td>
<td>- Design structure that promotes members’ free interact</td>
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<tr>
<td></td>
<td>- Ensure that the presentation or learning activity of one learner does not interfere with the learning activity of other learners</td>
</tr>
</tbody>
</table>

4. Conclusion: Applying Cooperative Learning to AI Ethics Education in School

Cooperative learning related to AI ethics education in the school field is to form a partnership between students and corresponding AI as learners, and to conduct team-level collaboration between students and AI based on this. At this time, as a colleague of group learning, AI should help and support students’ learning within the cooperative learning strategy. In this process, AI and students will mutually negotiate and achieve a higher level of moral development. This collaborative process and student development can be analyzed as shown in <Figure 4> in relation to the instructional design of cooperative learning.

Figure 4. Instructional design of AI ethics education through cooperative learning.

Ethics education according to these procedures is also approached from the perspective of modularized AI Ethics education[26]. Together with this, the essence of AI Ethics education contains contents related to the issue of responsibility of science and technology[27]. In particular, topics related to the function of AI Ethics are being explored in the form of approaches that seek to establish themselves between academic discourse and organizational reality[28]. It is clearly confirmed that the function of AI should assist Ethics[29]. And human beings must be clearly aware that AI Ethics must actually function[30].

Teaching and learning of Ethics Education specialized in AI Ethics Education can be divided into those that target AI and those that target Elementary and Middle School Students. At this time, the target of AI Ethics Education through School Education will be primarily adolescent students attending Elementary and Secondary Schools. However, in their Ethics Education Teaching and Learning, AI can perform the functions of others or peers who have important
influence. Therefore, it is proposed to develop and apply Teaching and Learning Method of Co-operative Learning that constitutes ethical AI, and enables such ethical AI to function as a subject of cooperative Learning in AI Ethics Education through Elementary and Secondary Education.

5. References

5.1. Journal articles


### 6. Appendix

#### 6.1. Authors contribution

<table>
<thead>
<tr>
<th>Initial name</th>
<th>Contribution</th>
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<tbody>
<tr>
<td>HK</td>
<td>- Set of concepts ✔</td>
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<td></td>
<td>- Design ✔</td>
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<td>- Getting results ✔</td>
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<td>- Analysis ✔</td>
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<td>- Make a significant contribution to collection ✔</td>
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<td>- Final approval of the paper ✔</td>
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<td>- Corresponding ✔</td>
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<td>- Play a decisive role in modification ✔</td>
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<td></td>
<td>- Significant contributions to concepts, designs, practices, analysis and interpretation of data ✔</td>
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<tr>
<td></td>
<td>- Participants in Drafting and Revising Papers ✔</td>
</tr>
<tr>
<td></td>
<td>- Someone who can explain all aspects of the paper ✔</td>
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