Logical framework for smart discussion in learning process

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Abstract. Different views on a problem are things that often occur in a discussion. In order to find a good conclusion in the discussion, it is necessary to make logical framework that builds a healthy discussion climate. This article discusses the logical framework in a discussion, which frequently uses common sense and rationality as the main pillar in the conclusion making process. This study applied a qualitative analysis approach that originates from the observation and interview with the class X students at the International Standard Boarding School of Amanatul Ummah who attended learning process with discussion method. The number of respondents covers 24 students. Research finding shows that discussion method in a learning process will work well when it has problem identification mechanism, factual argument, cause-effect analysis, and good communication pattern. Moreover, this research recommends ethical behaviors in the process of discussion learning activity as an important part in the discussion.

1. Introduction
Education is a conscious effort that people undertake as a formation process of intellectual and emotional fundamental skill [1]. Education is not merely a means of transferring knowledge, but in broadly sense, it is a means of culture and value distribution [2]. As the process of behavioural maturation in education, some subject’s explanation is done by discussion mechanism. In addition, discussion is aimed to strengthen the understanding of a learning material, and is a part of character education process, in which learners are familiarized to make good communication among discussion participants, by expressing logical and accountable opinions in a proper manner.

Researchers believe that discussion learning method is an effective method in a learning process [3,4]. Some studies related to the implementation of the discussion method include cooperative learning designed to influence the pattern of student interaction [5]; discussion learning process with the method of Student Team Achievement Division [6]; or the implementation of discussion Quantum Teaching Methods [7]. These studies emphasize the positive contribution to learning by discussion models, the studies, however, need to be strengthened by the logical framework of discussion.

This article reveals the discussion logical framework in the learning process with a rational thinking in the process of drawing conclusion. Through the proposed model, it is expected that learners are trained to provide strong and logical arguments, by appreciating/respecting the different opinions of discussion partners.

2. Method
The analysis method used as discussion instrument in this article is the observation of teaching materials discussion conducted in class X of International Standard Boarding School of Amanatul Ummah,
Mojokerto, Indonesia. The respondents of this study cover 24 students of class X. The writing of this article is also based on the author’s experience when attending various debate events in East Java.

3. Results and discussion

Learning is an activity that results in the change within learners, both on the actual and potential dimensions. The change is basically due to the effort that comes from the learners concerning memory, values, logic, or certain concepts. Moreover, knowledge can be strongly formed through the learning experience. The results of interviews with respondents show that one of learning experiences that is believed to effectively impact the strong memory and logic of learners is discussion method. Discussion method is a way of presenting learning materials in which teachers provide opportunity for students (groups of students) to make scientific discussion to collect opinion, make conclusion, or develop alternative solution to a problem.

Discussion method is a teaching method that presents learning materials within problems that students and teachers must solved. In this method, a problem is discussed and some possible solutions are forwarded [8]. Discussion method is usually carried out through the following steps:

- Selecting and fixing a material or problem that is appropriate for discussion. The chosen topic should allow some opinions occurrence, and remain within the limits of the student’s ability to solve the problem;
- Teacher as discussion facilitator or counsellor provides explanations on the subject matter of the discussion, the reasons for the discussion necessity, and the objectives of the discussion;
- After the discussion participants understand the problem, students are given the opportunity to express their own opinions;
- Discussion leader (teacher or group of students) should be able to arrange the talking turn for the students to express their opinions in an orderly manner, and direct the discussion process;
- Discussion leader should collect the similar opinions and the different points from the discussion participants, and finally make a conclusion as the end of the discussion.

![Mechanisms of discussion](image)

**Figure 1.** Mechanisms of discussion.

Discussion method is a good method to achieve the following learning objectives[9]:

- To train the ability of expressing opinions about a problem, defend opinion, and make opinion adjustment with the other participant based on a healthy exchange of thoughts;
• To train the ability to think together, build the ability of giving opinions, and receive and appreciate the others’ opinions;
• To train knowledge usage in solving a problem.
• Discussion method can be effectively implemented[9], through the following procedures:
  • Finding the interesting problem of discussion that can appeal all participants speak and answer;
  • Attracting all participants to actively propose and defend their opinions objectively;
  • Preparing a discussion site that allows all participants to sit face to face, and feel that they get the same position and rights.
• Drawing appropriate conclusions and respecting the opinions of all participants.

Based on of the author’s experience and understanding that the mechanisms to be taken in achieving the learning objectives in discussion method should follow the following stages as presented in Figure 1.

• Problem definition is done by making a definition/ explanation of the discussion problem
• Goal setting, target/ objective setting of the discussion problem.
• Status quo, a condition left without intervention based on fixed assumptions (ceteris paribus)

![Diagram of Critical Mechanism](image)

**Figure 2.** Critical Mechanism.

• **Critical mechanism.** Each participant of discussion provides an assessment and opinion on possibility, feasibility, urgency, and safety.
• **Argumentation,** delivering choice logic of a decision based on logic, experience, and evidence supporting the presented argument.
• **Compare.** Each participant compares the level of every option excellence by considering the negative impact that may occurs as a consequence of a particular choice decision
• **Conclusion,** drawing conclusion of the proposed problem.

Here is an illustration of the discussion model on Biology subjects for the topic of organic animal waste handling as presented in Table 1.
Table 1. Presentation of discussion material for biology subject entitled handling organic waste in farmers community

| No | Phase          | Description                                                                 | Evidence                                                                                                                                                                                                 |
|----|----------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A  | Problem definition | Handling organic waste in farmers community                                  | -                                                                                                                                                                                                       |
| B  | Goal Setting    | Handling organic farm waste to avoid environmental pollution, and have economic value by maintaining health and environmental sustainability | -                                                                                                                                                                                                       |
| C  | Status quo      | If the waste of manure not handled properly will cause environmental pollution | 1. Disposing farm waste carelessly will be a source of ground water pollution when exposed to rain water, which will have negative effect for people who consume the water[10].
2. Negative impacts of farm company covers environmental pollution from farm waste such as urine, faces, food scraps, sweat or metabolic remnants that disturb the surrounding community[11]. |
| D  | Critical mechanism | a. Compost (organic fertilizer)                                              | a. Utilization of farms waste, cattle dung especially can be used as organic fertilizer[11].                                                                                                           |
|    |                | b. Biogas                                                                   | b. Utilization of farm waste as raw material of biogas production[12]                                                                                                                                   |
|    |                | 2. Feasibility                                                              | The production of organic fertilizer and biogas has financial feasibility, and can be done with a simple technology[11,12]                                                                                 |
|    |                | Having economic and technological feasibility                                | • Environmental benefit[11]                                                                                                                                                                              |
|    |                | 3. Urgency                                                                  | • Energy benefit[11]                                                                                                                                                                                    |
|    |                | In addition to controlling environmental pollution, biogas and composting technology will provide financial, environmental and energy benefits. | • Financial benefit[12]                                                                                                                                                                                 |
|    |                | The applied technology is a safe technology, and is culturally acceptable to the farmers’ environment. | The management of organic waste into biogas (methane gas) uses simple technology that can be quickly adapted by society with adequate safety[11–13]                                             |
| E  | Argumentation   | If the management of farm waste is done well environmental pollution can be controlled, even will provide a lot of benefits.                    | Based on the analysis of investment criteria, the organic fertilizer business is feasible to run[14], reducing pollution caused by organic waste[11], and providing alternative energy through the concept of green technology[15] |
| F  | Compare         | Waste processing into biogas and compost has many advantages over conventional waste handling.                                     | Compared with conventional waste processing, farm waste processing into biogas and compost has a lot of benefits for environment [11–14]                                                                 |
| G  | Conclusion      | Handling organic farm waste can be done by making farm waste as raw material in the production of biogas and compost (organic fertilizer) |                                                                                                                                                                                                       |

Discussion is a means of student learning to carry out scientific arguments as a reasonable statement whose components include claims to a conclusion or statement), data (evidence supporting claims), evidence (explanation of the correlation between claim and data), support (basic assumption supporting evidence), qualification (a condition in which the claim is true), and disclaimer (a condition that breaks the claim). The correct argument is a condition when the data and conclusion support and fit each other. In performing discussion, teacher should arrange the schedule of discussion in a structured way, so that students can prepare various arguments and materials relevant to the topic of discussion. Based on
the author’s observation, for scheduled discussion, students can prepare better discussion material, for example presenting the topics through PowerPoint by using various learning media. The use of multimedia will strengthen the argumentation and evidence of the learning topics in the discussion [16–22].

The implications of discussion logical framework application by presenting a systematic mechanism and thinking is that the discussion will expectedly produce more valid conclusion by presenting relevant and accurate information. The important findings based on the results of observation and interview with the respondents is that in addition to systematic delivery of the subject material, the participants of discussion should hold ethics in conveying the discussion material. The correct word choice, sentence sequences, and sound intonation will have a good impact during a discussion. Moreover, it is expected that the presenter can convey his idea in a brief, clear, complete, correct, and organized manner; while students are hoped to communicate well in explaining the problem of discussion. According to the author’s observation, the quality, quantity, relevance, and clarity of the message will not be well accepted if the discussion participants lack of ethics and courtesy.

4. Conclusion
Discussion method in the learning process will work properly when having a problem identification mechanism, arguments with apparent evidence, analysis of causal relationship, and being done with a healthy communication pattern. In practice, the communication model within the smart discourse environment can be done through the following phases: (a) problem defining, (b) goal setting, (c) status quo, (d) argumentation, (e) critical mechanism, (f) comparison, (g) decision making as the result of discourse (conclusion). Furthermore, this study recommends to maintain ethical acts and behaviour during the discussion of learning activities as an important part of the discussion.

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