

## **Supplementary Material-2**

### **Argumentation Analysis Rubric**

Students' argumentation quality can be assessed by oral performance (Erduran et al., 2004; Osborne et al., 2004; Zohar & Nemet, 2002) or written performance (Atabey & Arslan, 2020; Aziz & Johari, 2023; Berland & Reiser, 2009; Wu & Tsai, 2007). The researcher created a coding rubric to assess participants' argumentation quality by reviewing previous studies (for analyzing the participants' written arguments' quality by using previous rubrics (Atabey & Topçu, 2020; Aziz & Johari, 2023; Sadler & Donnelly, 2006). Each level along with description and associating participant responses was provided in Table 1:

**Table 1: Written argumentation quality analysis rubric used in the study**

Level	Score	Criteria	Description	Sample excerpt
Level 1	1	Claim	Participant presents a claim (a position or a decision) but does not offer any elaboration for his/her position (do not include backing, i.e., data, warrant)	I would like a gold mine to be established where I live. (PT-2, pre-test)
Level 2	2	Claim with supportive <b>or</b> counter argument	Participant presents a claim which includes explanation, evidence and rationale for his/her position (includes backing, i.e., data, warrant)	Yes, I want [referring to the establishment of a gold mine nearby]. It creates employment for the people living in the city (PT-1, pre-test). Yes, I want [referring to the establishment of a gold mine nearby]. Gold has been an important mineral for centuries. With the establishment of gold mines in our country, direct employment opportunities for 6200 people and indirect employment opportunities for 25000 people were provided. (PT-6, post-test)
Level 3	3	Claim with supportive <b>and</b> counter-argument	Participant presents a claim which includes explanation, evidence and rationale for his/her position (includes backing, i.e., data, warrant). In addition, s/he provides alternative claims to a his/her claim with accompanying evidence	I do not want a gold mine to be established where I live since nature might be damaged while the gold is being mined. But if it [referring to gold mine] will contribute to my country's economy and will be beneficial to our country, I can consider its establishment. (PT-4, pre-test)
Level 4	4	Claim with supportive, counter-argument and rebuttal	Participants addresses a counter argument and provide rejection for valid reason which supports counter argument and supporting evidence.	The harm caused by the gold mine to nature and human health are facts that cannot be ignored. However, it is also a fact that gold is used in many fields such as medicine, industry, or space exploration with the development of technology. Yes, the damage to the environment is very high, but I believe that these damages will be minimized as much as possible with the developing technology. A lot of

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research is being done in this direction. While the gold mines are operated within certain rules, controls are also strictly carried out in these enterprises. If everything is done according to the rules, the establishment of a gold mine will not be a problem. (PT-6, post-test)

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