



Dialogue-Based Education and Critical Thinking: A Case Study of Iranian Primary Students

Saber Mansoori¹

Mohammad Ahmadnejad² (Corresponding author)

Elham Mohammadi³

ARTICLE INFO	ABSTRACT
<p>Received: 13 June 2023 Revised: 01 October 2023 Accepted: 14 November 2023 Online: 02 June 2024</p>	<p>The syllabus in Dialogue-based education emphasizes the learner's active participation in the learning process and is based on cultural, social, and political issues. The present study aimed to determine the effectiveness of the dialogue-based education model on the critical thinking skills of Iranian primary students. In so doing, 44 students were selected from the population using multistage cluster sampling. The Dialogue-Based Education Model was implemented to instruct the experimental group, and the Critical Thinking Questionnaire for Iranian Primary Students was employed to collect the data. The study's findings showed that the implementation of dialogue-based education significantly affected the participants' critical thinking skills. In the qualitative phase of the study, several participants in the experimental group shared their personal experiences of the course signifying their positive attitudes and perceptions towards the dialogue-based teaching method. Moreover, it was revealed that dialogue-based learning gives the learners a sense of ownership of the learning process by putting emphasis on learning in real contexts and encouraging the students to propose their own views while respecting those of others. In other words, students in the experimental group actively participated in classroom discussions, while in the control group, the students were passive and less involved in the course subjects, and rather than asking further questions, they were looking for answers to the questions.</p>
<p>KEYWORDS</p> <p>Conventional Education Critical Thinking Dialogue-based Education Primary students</p>	

¹ Assistant Professor, Department of Education, Farhangian University of Kurdistan, Sanandaj, Iran, Email: saber.mansoori@gmail.com

² Assistant Professor, Department of English & Linguistics, University of Kurdistan, Sanandaj, Iran, Email: m.ahmadnejad@uok.ac.ir

³ Assistant Professor, English Language Department, University of Zanjan, Zanjan, Iran, Email: e_mohammadi@znu.ac.ir

1. Introduction

In the global era, easy access to the internet has made all kinds of information, although unstructured and unorganized, available to everyone, everywhere. As a result, it is upon each individual to carefully and critically examine, categorize, and select the received information to distinguish valid and reliable information from falsehood and fabrication. Accordingly, training constructive, creative, and critical citizens requires shifting the focus of school programs from strategies and methods, which are based on rote learning, to critical thinking and knowledge creation (Myers, 2012).

In general, critical thinking has been investigated from philosophical and educational perspectives (Lai, 2011). Researchers in the philosophical tradition emphasize the qualities and standards of thought. A limitation of the definition of critical thinking from this viewpoint is that it does not conform to reality (Sternberg, 1986, as cited in Lai, 2011). Given the focus of the philosophical approach on the ideal critical thinker and people's capabilities, this approach seems to have less concern for how people think. Researchers in education have also commented on critical thinking, including Benjamin Bloom and his colleagues, who greatly contributed to teachers' instruction and assessment of higher-order thinking skills by presenting the taxonomy of educational objectives (Bloom et al., 1984). Their taxonomy for information processing skills contains a hierarchy from the lowest level, comprehension, to the highest, evaluation. Three of the highest levels (analysis, synthesis, and evaluation) usually represent critical thinking (Kennedy et al., 1991). An advantage of the educational approach over the other two is that the definition of critical thinking is based on class experiences and observations, which is not true of the cognitive psychological and philosophical approaches (Sternberg, 1986, as cited in Lai, 2011). On that basis, we have attempted in this research to use definitions that are in accordance with the educational approach.

Also, the Critical Thinking Community defines critical thinking as "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (Scriven & Paul, 2007). According to Paul and Elder (2008), critical thinkers always try to: (1) raise vital questions (and issues) and formulate them clearly and precisely, (2) gather and assess relevant information, (3) come up with a very well-reasoned conclusion, (4) be open-minded to any ideas, and (5) communicate effectively. In fact, the prerequisite for the economic, cultural, social, and political

development in any society is the existence of people who are well-educated and thoughtful which, in turn, depends on the existence of a dynamic and active education. Therefore, it can be concluded that any social development results from an efficient and proper education, and this depends on several factors including the use of new and active educational methods, including dialogue-based education model (Mansoori et al., 2016).

The underlying theory of learning for the dialogue-based education model can be linked to constructivists such as John Dewey, Jean Piaget, and especially social constructivists such as Lev Vygotsky. Social constructivism is a meaningful process of learning through interaction between individuals (Benus, 2011). Vygotsky, who introduced the concept of 'scaffolding', showed that the teacher's interaction with learners and learners' interaction with their peers are quite effective in the process of learning. In fact, in the process of relying on a teacher or a skilled person's continuous support, learners move progressively toward their potential performance and the actual learning phase. Therefore, the dialogue-based education model can be useful in developing collective understanding and knowledge during the process of 'scaffolding' (Game & Metcalfe, 2009).

One of the most important criteria for dialogue is questioning and question-raising, where each of the participants needs to ask questions regarding the ambiguities and misunderstandings emerging during the dialogue process. Bakhtin (1981) maintains that dialogue and conversation can be differentiated in terms of questioning. If an answer does not present a new question, for instance, it is excluded from dialogue (Walshe, 2013). In dialogue education, the guide raises questions to extract thoughtful answers and have further questions generated, for the construction of meaning and comprehension (Oregon, 2009; Walshe, 2013; Worthy et al., 2012). In a dialogue interaction, the guide and the participants not only exchange ideas but also acquire new meanings by asking original questions (Chan & Van Kraayenoord, 1998). Boyd and Markarian (2011) state that the teacher's open questions on issues suggested in class that demand more than one answer from the learners increase the number of participatory learner interpretations. In fact, the original questions result in thinking and reflection, promotion of comprehension, and explanation and elaboration of relevant information by the learners. By raising these questions, the teacher both promotes the learners' answers and cultivates a dialogue atmosphere. These questions vary from the learners' personal knowledge and experience of different issues. Moreover, the guide should suspend his knowledge and experience, and promote dialogue between the learners through questioning. In such a climate, the learners need to argue by reflecting on the ideas through evidence and instances after

identifying the assumptions (Lyle, 2008). In fact, participants learn better when encounter questions during the dialogue interactions on different topics and issues raised in the classroom (Skidmore, 2006).

The use of dialogue in teaching and learning processes differs from the other forms of interaction in which the teacher usually asks closed-ended questions, and the learners compete in an attempt to express the correct answer. In contrast, education, in the form of dialogue, takes place through a relatively long interaction between the teacher and the learners as well as learners and their peers in a collaborative and mutually supportive environment with the aim of helping learners understand and compare different ideas, and practice thinking through expressing different concepts (Alexander, 2000). In a research aimed at analyzing the interaction between 12 teachers and their students in a science course, Mercer et al. (2009) noted that teachers need to apply various types of interaction, especially dialogue, in order to enhance the students' everyday understanding of different phenomena including scientific understanding. The ultimate aim of dialogue-based education is to help learners enhance their new conceptual relationships and their knowledge base level (Oh & Reamy, 2014). By providing an active and participatory communication environment for learners, dialogue presents a series of coordinated, collective, conscious, and deliberate communicative actions to create common understanding, gain insight into problems, and solve conflicts (Neumann-Boxer, 2012). Despite the emphasis on the development of intellectual skills by many scholars, especially engaging students in critical thinking and questioning in modern education systems, this view has failed to overcome the presuppositions of traditional education. In fact, to enhance the effectiveness of the measures taken to teach thinking skills, the quality and quantity of teacher-to-students and student-to-student interactions need to go through fundamental changes (Trickey & Topping, 2004). Even though school activities are aimed at children and teenagers, evidence suggests that current curricula have not been able to foster thinking, questioning, and criticizing skills in students. How is it possible for children to keep on learning and acting in their societies if they do not think individually and collaboratively and do not work together in groups while studying (Tabatabaee & Mousavi, 2011)?

There should be some prerequisite principles and conditions including informal, unplanned rules that subconsciously guide people's patterns of interaction with each other in public as cultural norms (Bicchieri, 2006). In fact, the methods of interaction reflect the rules and values of the society where we live (Wilkinson & Pickett, 2010). In fact, dialogue interactions in every society are affected by the social, cultural, economic, and historical backgrounds of that

society (Roper & Weaver, 2004). For example, people in a society may not be very willing to get involved in conflicts and confrontations and prefer to adapt themselves to hierarchical relations. It is even possible that some people in the hierarchy consider themselves pivotal and others marginal (Wals & Schwarzin, 2012).

Therefore, this study aims to address the research gap by investigating the effectiveness of the dialogue-based education model on the critical thinking skills of Iranian primary students. Through examining both quantitative and qualitative aspects, this research seeks to provide a comprehensive understanding of the dialogue-based education model's role in enhancing the critical thinking skills of the participants of the study. Our research endeavors to contribute valuable insights into the dynamic interplay between dialogue and critical thinking, and how such critical thinking skills can prepare learners to adapt and thrive in the rapidly changing educational landscape of today's world. The inclusion of both quantitative and qualitative measures will offer a more nuanced perspective on the effectiveness of the dialogue-based model, and the findings will have practical implications for educators, researchers, and policymakers, guiding them in maximizing the benefits of dialogue-based education to create effective and engaging learning experiences. This study was guided by the following research questions:

1. To what extent does the use of a dialogue-based education model impact Iranian primary students' critical thinking skills?
2. What are the attitudes and perspectives of Iranian primary students towards the use of the dialogue-based education model?

2. Literature Review

In a qualitative study, Ching-Chiang and Fernández-Cárdenas (2020) explored ways of reducing marginality and promoting inclusion through dialogic and transformative learning in STEM (Science, Technology, Engineering and Maths) education. They argued that the main advantage of dialogic learning might lie in providing opportunities to empower teachers and increase students' participation. The research demonstrated dialogical education as a way to initiate transformational processes in the school. Further, concerning the students' response to dialogic pedagogy, Juuti et al. (2020) observed that students' interest was higher in dialogic talk situations than in non-dialogic talk situations. It was revealed that dialogic talk is associated with learners' interests and concerns. Vrikki et al. (2019) probed the occurrence of dialogue forms that are widely regarded as productive in English primary schools and found somewhat frequent usage of many such forms in primary classrooms. Moreover, the teacher's power to shape

classroom dialogue was highlighted. Regarding dialogic-based training of teachers, Rodriguez et al. (2020) identified positive consequences for the future practices of the participating teachers. The teachers were capable of addressing school problems and applying their newly acquired knowledge to their job. The researchers reported the extensive impact (in terms of learning, attention, interest, reflection, etc.) of such training on the teachers which also led to better learning outcomes for learners. Through a longitudinal case study, Flecha and Soler (2013) reported on a dialogic school-based transformation among Roma families and revealed how its implementation impacted the whole process of schooling and improved the Roma children's academic performance and engagement. Prior to such transformation, these students had constantly experienced failure and had few actual learning opportunities. However, interaction, dialogue, and small-group work led to an increase in children's learning and showed how Roma children benefitted from dialogic learning interactions.

The findings of a research by Hashmyan-Nezhad (2003) indicated that students' intellectual skills are not adequate to confront the issues of today's world and the Information Age. This suggests that in the Iranian education system instead of focusing on how to recognize issues, learn from each other, foster thinking, acquire abilities to identify issues in their environment, analyze problems, and more critical thinking skills, the emphasis is on rote memorization and conservatism; the teaching methods lack modernism, creativity, and foresight. For example, in most countries, especially American and European countries, some measures have been taken, inspired by the "Philosophy for Children" program developed by Matthew Lipman in the 1970s, such as changes in curriculum and the content of books, and implementation of dialogue-based education to promote thinking, especially critical thinking (Marashi et al., 2008). Given this, dialogue-based education can be considered a missing link among educational patterns, which is closely related to the principles and assumptions of Constructivism.

Despite the emphasis of experts and research findings on the effectiveness of dialogue in learning and developing students' critical thinking, it has long been neglected in Iran's educational system. For example, after reviewing the books authored on teaching methods and techniques, no indication of dialogue was found. Only some implicit mentions of dialogue have been made under the topic of group discussion and cooperative learning, for which no particular framework has been provided (Fardanesh, 2011). Furthermore, the critical evaluation of the research background in Iran reveals that studies have mostly focused on the theoretical foundations using the Descriptive analytical method of Socratic dialogue, and none of them has

focused on proposing a coherent and organized framework and model (Chenari, 2008).

Likewise, dialogue is not practiced in the Iranian education system despite its significance in education. The absence of dialogue in the process of teaching and learning may be due to the domination of traditional and inactive methods, teacher-centered monologues in classrooms, and the lack of a specific framework for applying dialogue. Accordingly, considering the role and importance of dialogue in improving the processes of learning and teaching, the present study tries to determine the impact of dialogue-based educational model on students' critical thinking development in the Iranian context of elementary schools. Further research in this area will contribute to a more comprehensive understanding of the dialogue-based education model's role in learning and inform the design of effective curricula, lesson plans, and educational approaches.

3. Research Method

Adopting an applied approach, the present study employed a quasi-experimental design including a pre-test, a post-test, and a control group. The statistical population of the study consisted of 5th-grade male students in a primary school in Dehgolan, a small town in Western Iran, in 2021. Using multistage cluster sampling, 44 students were selected from the population. Twenty-one students were randomly assigned to the experimental group, and the other twenty-three students were assigned to the control group. The questions in the questionnaire were prepared in accordance with the age and cognitive development of elementary children and were mostly presented to them visually. In the experimental group, the different topics of the science textbook were taught through the dialogic method for a period of two months, consisting of three two-hour sessions per week, a total of 24 sessions. However, in the control group, the traditional teacher-centered method was implemented.

The data collection tool was the Critical Thinking Questionnaire, designed and normalized by Shabani (2008) for primary students, which consists of 27 questions based on three factors of diagnosis, comparison, and judgment. Content validity and face validity were verified by 10 experts in psychometrics. Also, factor analysis was used to assess the construct validity of the questionnaire, demonstrating a high correlation between the three factors of critical thinking. Also, the Kuder-Richardson formula was used to estimate the reliability of the Critical Thinking Test, which was from 67% to 70%. Finally, the data were analyzed using multivariate analysis of variance test. Dialogue-based education was conducted based on the designed model of Mansoori et al., (2016), which includes two stages: 1. Formation of dialogue loops and 2. Implementation of dialogue-based education. The dialogue-based educational

planning scheme is composed of the following components:

- I. Dialogue loops
- II. Context
- III. Objectives
- IV. Assessment

Based on Figure (1), dialogue loops first need to form between the learners. Then, teaching begins in light of the context, objectives, and assessment components. Dialogue loops have three components that are required for actual dialogue loops to form. The elements of a dialogue loop are detailed below.

- *Participants*: In view of the theoretical foundation of dialogue, it is common to use notions like facilitator, coordinator, or guide rather than teacher. Moreover, the notion of participant or group member is used rather than learner or student, each holding its own responsibilities.
- *Facilitator/Coordinator*: raising questions on the issues and topics that exist in the group members' or participants' living environments and providing information and resources to develop critical thinking are among the coordinator's responsibilities. Others include organizing the classroom, assigning participants to dialogue loops, doing authentic exercises and assignments, and scientific and participatory activities, and encouraging the individuals to trust each other for effective learning and change (Alexander, 2000; Shor, 2012). According to Paulo Freire, an effective coordinator is one who raises stimulating questions and persuades the participants to raise such questions (Freire, 2007). The Presence of a skillful facilitator is conducive to the group members' adherence to the principles and conditions of dialogue. Besides getting the group engaged in dialogue, the facilitator should instruct the participants to participate in the dialogue interactions independently and to become increasingly aware of their own actions and behaviors in the formation of dialogue (Roper & Weaver, 2004).

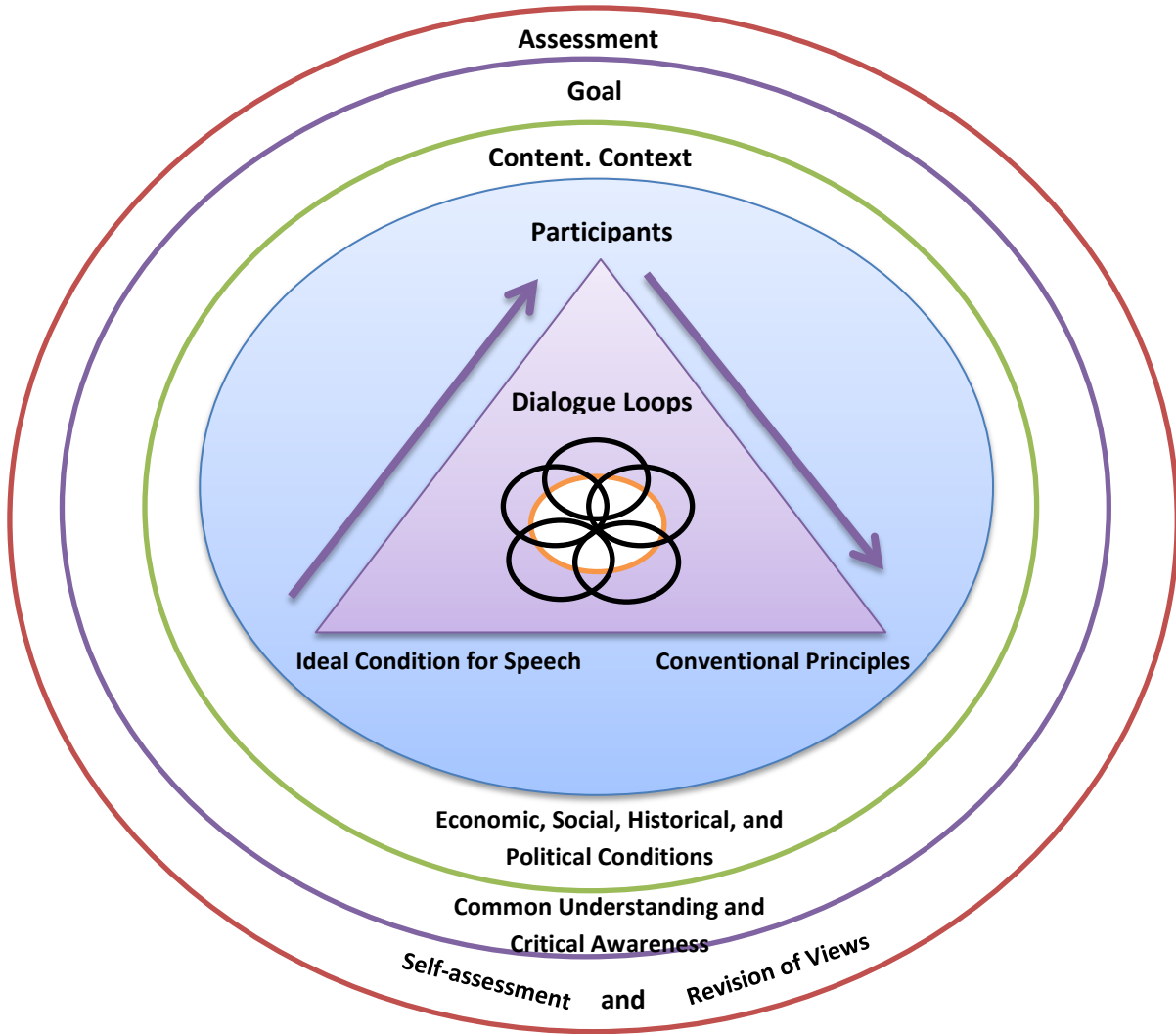


Figure (1): Conceptual model of dialogue-based education (Mansoori et al., 2016)

- *Group members*: these include individuals who get involved in a dialogue by adhering to and considering the conditions, principles, and criteria effective on the formation of dialogue loops. Arjen et al. (2012) argue that the formation of a dialogue interaction is subject to two areas: personal and interpersonal. For instance, each person's willingness, preparedness, and competence are effective in the formation of a dialogue interaction.
- *Prerequisite principles and conditions*: These denote the circumstances in the absence of which another form of communication (such as discussion, conversation, debate, etc.)

would replace the dialogue. These conditions involve a secure, threat-free space where the individuals participate in dialogue and raise questions with mutual trust and absolute sincerity.

- *Arbitrary criteria*: The prerequisite principles and conditions of dialogue are necessary for the formation of dialogue loops but not sufficient. These criteria are arbitrary and are set by the group members to achieve mutual comprehension and public agreement and should be observed by all the participants. The criteria include clarification of one's own reflections, question-raising, active listening, participants' respect for each other, communication, suspension of judgments and avoidance of prejudgments, and sympathy (Nistani, 2011). An effective principle that needs to be observed by the group members is sympathetic listening, i.e., listening to and getting involved in others' points of view even if contrary to one's own opinions or beliefs (Heath et al., 2006). Effective strategies in sympathetic listening include the examination of perceptions and presumptions, provision of feedback for assessment of the impacts of different measurements, and expression of non-evaluative and non-aggressive comments (Baraldi, 2006). Ellinor and Girard (2023) suggest four fundamental, interrelated principles for dialogue: suspension of judgments, identification of assumptions, active listening, and inquiry or reflection. Observation of the arbitrary criteria ensures that successful dialogue is carried out.

Therefore, dialogue education is a basic method of suggestion of arguments and examination of the learners' presumptions using a sequence of thought-provoking questions. The students are regarded as thinkers and decision-makers in this type of education. Learning takes place when the teacher encourages the learners to question, explain, and analyze issues (Burbules & Bruce, 2001; Sherrod & Wilhelm, 2009; Worthy et al., 2012). Black et al. (2003) state that it is essential for the establishment of a dialogue atmosphere to consider a waiting time for the learners to raise questions and answers and to develop a sense of self-confidence. Lodge (2005) identifies six types of questions that the participants can ask each other during dialogue, as follows:

- 1- Explanatory questions: What do you mean by ...? What are you trying to say? What is your main point? What does this have to do with ...?
- 2- Questions exploring the assumptions: What have you assumed? What are your assumptions?
- 3- Questions exploring the reasons, evidence, and causes: What are your reasons for

stating this? What else does one need to know?

- 4- Questions seeking the opinions and points of view: You seem to be approaching the issue from the aspect of Why have you preferred this point of view to that one? How would others react to the issue and why?
- 5- Questions exploring the implications and consequences: What are you trying to conclude from this? When you state that ..., are you trying to convey that ...?
- 6- Questions on the problem: How can one figure out? How can the problem be resolved?

Stage One: The formation of Dialogue Loops

The implementation of dialogue-based education depends on the formation of dialogue loops. Real dialogue loops revolve around three factors: the ideal condition for speech, participants, and conventional principles.

1. **The ideal condition for speech:** The first major factor in the formation of dialogue loops is the Ideal Condition for Speech which includes a stress-free and secure space with friendship, intimacy, trust, hope, and motivation, and without competition, threats, and humiliation. Accordingly, the guide or facilitator, taking into account the Ideal Condition for speech, attempts to put the learners into small groups. Ideal Condition for speech may be influenced by family culture and society, and it is the duty of the facilitator to create it. The facilitator can provide a safe and free-of-threat and humiliation environment through strategies such as giving responsibility to socially marginalized learners, modeling behaviors based on friendship and cooperation, and encouraging altruism.

One of the effective techniques for classifying learners based on the Ideal Condition for speech is when the facilitator selects a group of active and motivated learners as a nucleus group, and after sharing the goals, tasks, and activities that are necessary to form the dialogue loops, each member of the nucleus group will be in charge as head of a group; these groups will be formed based on intimacy, trust, active participation, motivation and so on. The relationship between the members of the nucleus group and the facilitator should meet a number of criteria:

- The relationship between the members of the nucleus group and the facilitator should not be biased toward favoring some learners.
- Forming a nucleus group and holding coordination meetings should be in an

informal manner.

- The relationship between the facilitator and learners should be horizontal so that everyone has equal rights to comment.

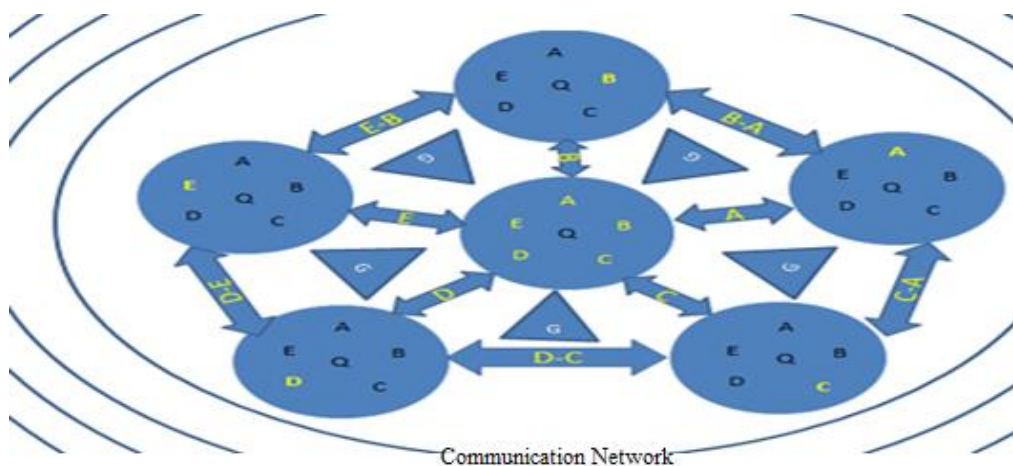


Figure (2). Dialogue Loops, Facilitator, and Questions in a Communication Network (Mansoori et al., 2016)

2. **Setting the conventional principles:** The ideal Condition for speech is the necessary condition for dialogue, and conventional principles and rules, which are determined by the participants, are the sufficient conditions for its performance. These principles include avoiding interrupting others, active listening, suspending presuppositions and judgments, asking for clarifications in case of ambiguities, and tolerating opposing views.

Stage Two: Implementing Dialogue-Based Education

1. **The Initiation and the Content of the Dialogue:** Dialogue-based teaching begins after forming dialogue loops by asking a question or talking about a problem. Here is an example of dialogue-based teaching in a science class for 5th-grade primary students. The topic is "Personal Hygiene": The facilitator initiates the dialogue with this question: "Dear children, how can we stay healthy?" Participants respond based on what they have seen, heard, or studied. Their responses may be from their textbook, but the facilitator is responsible for extending the dialogue beyond the content of the textbook. So, s/he should not evaluate the responses of the participants, but they must give reasons for their responses. The facilitator can also correct misunderstandings and judgments of the participants by designing a variety

of questions. The facilitator can use the content of the textbook to start a dialogue and provide more content through dialogue and discussion with the participants. Indeed, in dialogue-based education, the facilitator does not confine himself to the content of the book, and most of the content is produced and reproduced in the immediate context of the class and based on the realities of the participants' lives. (Mansoori et al., 2016)



Figure (3). A dialogue session on personal and public hygiene

This diagram illustrates a dialogue session where a student comments on the effects of how people spend leisure time on personal and public hygiene.

2. **Dialogue-based goals:** Since all participants express their ideas in dialogue-based teaching, and subjects and problems are examined from different perspectives, eventually common understanding and collective consciousness would emerge. Moreover, participants would listen to others' reasons and views and would develop their critical awareness.
3. **Assessment:** In dialogue-based education, further emphasis is placed on self-evaluation. Having finished teaching the dialogue, the facilitator encourages participants to express what they learned through dialogue. The facilitator can sum up the participants' views in two ways: getting feedback and asking for recommendations on the implementation process of the dialogue and looking at how the participants' understanding evolves compared to the pre-implementation of the dialogue.

The procedure for the Dialogue-based science classroom

In the experimental group, before starting the training course, the manners and rules of speaking including taking turns, not interrupting others, speaking with permission, not making quick judgments about other people's opinions, listening carefully to their classmates and the facilitator, supporting opinions with evidence, and other necessary matters were

taught to the students. Then they were grouped based on the principles of dialogue-based model. A group of students commented on the question "How to stay healthy?" in front of all the students, then other students were asked for their opinions. In the same way, all groups discussed the main question. Based on what they had seen, heard, and experienced, the students presented questions and answers beyond the contents of the textbook, and this made the students' understanding of the issue of health not limited to the content of the textbook, but the cultural, social, economic, historical and even political aspects of the issue of health were investigated, and, as a result, the students' critical awareness was encouraged and the goals of education in general and dialogue-based instruction in particular were achieved. For example, issues such as the relationship between poverty or working-class income and health and nutritional quality were explored by students. Also, injustice, social class gaps and differences, addiction, and malnutrition were among the topics mentioned by the students. In addition, the students were asked to express their lived experiences from the implementation of dialogue-based education in oral and written forms, and this gave them a deep understanding of various topics, including health. Finally, the students were asked to reflect on what they did during the class and share their ideas with the facilitator.

It was revealed that they were mostly surprised and satisfied with the experience, and examining different aspects of the discussed subjects had led to a comprehensive and deeper understanding of the topics. Since assessment in dialogue-based education is done during the course as a process, the teacher graded students on the process based on their class performance. The aim was to help students strengthen their argument and support their position with evidence and demonstrate that they have considered different perspectives. In fact, this model puts emphasis not only on the final product but the development that occurs through the learning process.

However, in the control group, education was carried out in the traditional way through lectures. In so doing, first, the teacher explained the content of the textbook to the students, and then the students' questions were answered. And only the content of the book, which was the selected content about nutrition, was discussed. Finally, students' learning was evaluated in the form of a written test.

4. Findings

Quantitative Phase

In the quantitative phase, the analysis of the effectiveness of dialogue-based education has been reported in two sections: descriptive and inferential statistics.

Descriptive Statistics

Table 1

Descriptive indexes for three factors of diagnosis, comparison, and judgment (Critical Thinking) in the experimental group

	No.	mean	standard error	standard deviation
Pre-test diagnosis	21	۳,۸۰۷	.199	.914
Post-test diagnosis	21	۳,۸۳۷	.200	.919
Pre-test judgment	21	۴,۰۸۸	.481	.206
Post-test judgment	21	۴,۱۴	.524	.405
Pre-test comparison	21	۳,۲۲	.112	.515
Post-test comparison	21	۳,۱۹	.102	.468

The table above shows the descriptive indexes of the pre-test and post-test of the diagnosis, judgment, and comparison (critical thinking) factors in the experimental group, which include the number of participants, mean, standard error of measurement (SEM), and standard deviation (SD).

Table 2

Descriptive indexes for three factors of diagnosis, judgment, and comparison (Critical Thinking) in the control group

	No.	mean	standard error	standard deviation
Pre-test diagnosis	23	4.14	.۲۲۱	۱.060
Post-test diagnosis	23	4.60	.۲۲۲	۱.068
Pre-test judgment	23	4.054	.502	.410
Post-test judgment	23	4.37	.496	.۳۸۳
Pre-test comparison	23	3.58	.۱۲8	.۶۱۷
Post-test comparison	23	4.11	.۱۳۸	.۶۶۵

The table above shows the descriptive indexes of the pre-test and post-test for diagnosis, judgment, and comparison (Critical Thinking) factors in the control group, which includes the number of participants, mean, standard error (SEM), and standard deviation (SD).

Inferential Statistics

In this section, the research hypothesis (i.e., students who are taught through a dialogue-based model possess more critical thinking skills than those who are taught through traditional methods) has been investigated. In order to examine this hypothesis, multivariate covariance

analysis assumptions were first checked. Regarding the results, since the homogeneity of regression slopes was violated, a multivariate analysis of variance was employed. To use this test, the pre-test scores were deducted from the post-test scores and then multivariate analysis of variance was applied to the remaining scores. In performing the multivariate analysis of variance, the assumptions of the test were first examined, and the results were as follows:

Table 3. *The assumption of the normal distribution of variables in groups*

	Diagnosis		comparison		judgment	
	K-S	Sig	K-S	Sig	K-S	Sig
The experimental group	.715	.686	1.054	.217	1.184	.121
The control group	.712	.690	.861	.449	1.269	.080

The table above examines the assumption that the distribution of scores is normal in the groups. The results indicated that the distribution of variables is normal across all groups, and the significance level of Kolmogorov-Smirnov test (K-S) is higher than 0.05 for both variables in both groups.

Table 4. *Homogeneity of variance-covariance matrices*

significance level	error degree of freedom	degree of freedom	F	Box
.26	1.248E4	6	1.26	8.24

The above table examines the homogeneity of variance-covariance matrices assumption, which, according to the calculated F value with the degrees of freedom of 6 and 1248, is smaller than the critical value, and the obtained significance level is 0.754 which is above the 0.05 level. Therefore, the assumption is met, and multivariate analysis of variance is applicable.

Table 5. *Analysis of multivariate variance*

Effect	Value	F	Degree of freedom	Error degree of freedom	Sig. level
Pylyay effect	.780	1.814a	3.00	40.00	.001
Wilk's lambda	.242	1.814a	3.00	40.00	.001
Hotelling's effect	3.13	1.814a	3.00	40.00	.001
The smallest root	3.13	1.814a	3.00	40.00	.001

In light of the results reported in table 5, all four multivariate p values are at the significant alpha level of 0.01, then, we can state that our hypothesis that “students who are taught through dialogue-based method have more critical thinking skills than traditionally taught learners” is approved. These observed values indicate that there is a significant difference between the linear combination of the dependent variables across different levels of the independent variable. In the following table, one-way analysis of variance is used to determine meaningful effects of the independent variable on each of the dependent variables.

Table 6

Homogeneity of variances

	Sig	Df	Df1	F
Diagnosis	.۰۹۰	۴۲	۱	2.92
Comparison	.۰۱۲۶	۴۲	۱	۲.44
judgment	.۸۱۷	۴۲	۱	.054

The results in table 6 reveal that all the scores obtained for three dependent variables in different groups have a homogeneous variance: the calculated value equals 2.92 for diagnosis, 2.44 for comparison, and 0.054 for judgment with degrees of freedom of 1 and 42 and significance levels beyond 0.05. Therefore, one-way analysis of variance is appropriate to be conducted.

Table 7

One-way analysis of variance

Sig.	F	Mean Square	Degrees of freedom	Sum of squares	Statistical indexes of change resources	
0.01	68.90	2.014	۱	2.014	diagnosis	Intergroup
0.01	60.030	3.54	۱	3.54	comparison	
0.01	8.019	.0812	۱	.812	judgment	
		.029	۴۲	1.22	diagnosis	error
		.059	۴۲	2.47	comparison	
		.101	۴۲	4.25	judgment	
			۴۴	6.067	diagnosis	total
			۴۴	9.080	comparison	
			۴۴	6.72	judgment	

The table above demonstrates the effectiveness of the independent variable (dialogue-based education) on the components of critical thinking. The results indicate that the independent variable (dialogue-based education) has a significant impact on the three components of critical thinking, with a calculated F value of 68.900 for diagnosis, 60.030 for comparison, and 8.019 for judgment with degrees of freedom of 1 and 42. These values were greater than the critical values. Hence, it can be stated that the independent variable (dialogue-based education) has a meaningful impact on the three variables. Consequently, the hypothesis that "students who are taught through dialogue-based method have more critical thinking skills than traditionally taught learners" is confirmed. Moreover, the results of the one-way analysis of variance support the impact of dialogue-based education on students' critical thinking skills.

The findings of the present study showed that students who are taught through dialogue-based methods possess more critical thinking skills than those who are taught through traditional methods.

Qualitative Phase

The qualitative phase of the study aimed to explore the attitudes and perspectives of the students, providing insights into their views towards the teaching method in dialogue-based education. In doing so, the views of the students about the dialogues they established with the teacher and other students were gathered. After the completion of the course, the dialogues were analyzed and coded through thematic analysis. The unit of analysis was the content of the students' comments instead of words, sentences, or paragraphs. Most of the students expressed positive views about the experience, considering it very interesting and beneficial. The following themes were extracted from the students' comments:

Discovering New Phenomena and Topics

Participants in the study believed that dialogue could help them discover new phenomena and topics. One participant expressed their positive experience, stating, "This teaching method was very interesting because, in its every moment, I felt like something new was being discovered" (*Erfan*). Another participant claimed that "In this teaching method, we covered more than what was included in the book. Especially when we reflected on the words of the teacher or other classmates and each of us talked about what they had experienced" (*Hemen*).

Active Listening

Several participants highlighted the advantages of active listening. One of the participants stated, "Although we were confused at the beginning of the course, by following the specified guidelines, most of my classmates got engaged in active listening, and in addition to learning the content of the book, they shared their experiences and drew examples from their real lives which led to having a more interesting content" (*Sirwan*). Another participant commented in this regard, saying, "In this method, I learned that there is a difference between ordinary listening and active listening. At the beginning of the course, it was very hard to concentrate and listen to the opinions of others due to the noise and clamoring of the classmates, but gradually I learned to focus on the key concepts" (*Diacó*).

Collaborative Learning and Cooperation Instead of Competition

Several participants highlighted the advantages of having collaboration and cooperation with their classmates. They believed that they had a more friendly learning experience which enhanced their motivation and engagement. One participant expressed such sentiment, stating, "The possibility of learning from other friends was very interesting" (*Matin*). As another student expressed, "One of the interesting aspects of this teaching method was the different questions raised by the students and the open space to examine their answers" (*Majed*). These participants firmly believed that these aspects would contribute significantly to a cooperative learning experience and friendship and cooperation instead of competition. A participant expressed this viewpoint by stating, "This kind of teaching was very entertaining and exciting, and I felt more intimate and closer to my classmates, particularly when I was not afraid of making mistakes" (*Yasin*).

Respecting others' viewpoints

Participants voiced their interest in having social interaction, highlighting the value of engaging in community discussions while respecting their classmates. For example, one participant stated, "In earlier days, whenever the teacher asked a question, we would all express our thoughts together; however, in this method, we learned to respect others' opinions and take turns speaking" (*Siamak*). Also, another student mentioned "It was the first time that all students were required to express themselves. In the beginning, there was a lot of disorder, but gradually we learned to maintain discipline by taking turns to speak, actively listening to the opinions of others, and respecting the views of others" (*Mohammad*).

The Teacher as a Guide and Not a Lecturer

In dialogue-based instruction, it is very important to develop suitable questions, plan the time ahead, and acknowledge all answers during the class. Students learn best when they make sense and make their own meaning. The teacher is not an explainer who lectures from the beginning to the end of the class. Instead, the teacher is a guide who monitors the class and provides help and assistance when needed. As one student put "In this teaching method, unlike the earlier days, the teacher talked less and guided us more and always posed challenging questions" (*Parsa*).

Reasoning and Using the Internet to Learn New Ideas

The participants found the dialogue-based course to be a valuable and useful model that taught them to think and use reasoning prior to answering questions. Also, they were encouraged to use the Internet to explore new ideas and not waste their time surfing the net aimlessly. One participant expressed their positive experience, stating, "In this teaching method, we were supposed to give reasons for our comments. Besides, every topic was explored from different angles" (*Aman*). Another participant commented on this aspect, saying, "This teaching method encouraged us to surf the internet to find answers to the questions raised in the classroom, and the learning would still go on outside the classroom" (*Hajir*).

Thinking Together (Collaborative Thinking)

Collaborative thinking involves actively listening to and building on the ideas of others, as well as critically evaluating them based on one's own values and beliefs. Exchanging ideas is at the very core of collaborative thinking. Providing ample opportunity to foster this very important life skill is one of the advantages of dialogue-based education. According to one participant, "In this teaching method, the teacher constantly forced us to either ask questions or comment on the questions, and this made us think and reflect" (*Rezgar*). Another participant expressed this viewpoint by stating, "In this type of education, we had more opportunity to think, and this made us learn the material deeply and permanently. The class atmosphere was such that we learned together" (*Mikael*).

Getting to Know Yourself and Your Surroundings

Self-awareness is the skill of paying attention to yourself and how your behavior, thoughts, or feelings match or mismatch with your inner standards. Being self-aware makes people more content and improves their relationships. They also feel more in charge of themselves and their social milieu, as

well as more satisfied with their work. One participant stated, "I was shy in the beginning, but gradually I gained my self-confidence and started to believe in myself" (*Ramyar*). Also, being mindful of what is happening around you, or having environmental awareness, is essential for many activities. One participant stated, "This learning method enabled us to learn the course material with more examples, especially the ones that are taken from our surroundings" (*Mikael*). Further, another student claimed that "In this method, we got familiar with our surroundings through questioning and answering" (*Kian*).

The arguments and reasons that are put forward by the students of the experimental group in response to the questions corroborate their increased capacity to think critically and the fact that these skills have grown because of receiving dialogue-based education. In fact, most of the students provided no answers to the questions that demanded elaboration in the pretest stage, while they provided justifiable reasons in the posttest stage.

5. Conclusion

Since the findings of the research support the hypothesis that students who are taught through the dialogue-based method are better at critical thinking than traditionally taught learners, it can be inferred that when the learners, under the supervision of their teacher as a facilitator, analyze their own everyday problems from a variety of perspectives, they become more aware of the origins of those problems. According to Schein (2003), when learners are listening to what seems irrelevant, in fact, they are noticing the prejudice and the complexity of the meanings and thoughts expressed by each of the members. In such a process we are not trying to convince each other, rather we try to establish a shared experience that lets us learn in groups and gain critical awareness.

In the present study, students in the experimental group actively participated in classroom discussions. For example, we observed various questions being raised by the students. Since the implementation of dialogue-based education requires discipline, in the experimental group, the students took turns to speak, listened to each other attentively, and tried to support what they said with logical reasons and evidence. The students were trying to understand the topics that were discussed instead of memorizing them, and this led them to ask questions about abstract and incomprehensible concepts and associate the topics in their textbook with the issues and phenomena in their real lives. However, in the control group, the students were almost passive and less involved in the course subjects. Rather than asking

further questions, they were looking for answers to the questions.

While in other learning methods assessment often involves teachers asking questions and learners trying to guess the correct answers followed by teachers' feedback, assessment in dialogue-based learning is accomplished through self-evaluation; the learners during the dialogue process revise their own views through listening, questioning, and commenting on the views of others. To ease the learning process, the teacher should foster a secure, friendly, and dynamic class atmosphere. In fact, 'dialogue' consists of thinking, reasoning, suggesting ideas freely, and putting ideas together to gain a deep insight into the problems and issues under scrutiny.

Provided that the ideal conditions exist in which an individual can easily communicate with others, such an atmosphere will allow students to comfortably express their thoughts and reflections without feelings of submission or fear of punishment and ridicule and subject them to criticism and opposition from their peers. Such circumstances will enable students to try and to listen to others' views without prejudice in all walks of life. Thus, a spirit of openness to advice and criticism will grow in them, and their capability and tolerance of confrontation will improve, contributing to critical thinking skills (Kamali and Khavari, 2011).

In fact, dialogue-based education creates a flexible atmosphere for learning where the learners can come up with new ideas and share their views about various problems. Getting involved in dialogue is educationally, personally, and socially vital because the learners investigate the facts themselves and communicate to understand problems (Worthy et al., 2012). In the same vein, some scholars believe that dialogue, through interaction between the teacher and students, paves the way for knowledge creation and accelerates the process of cognitive development of the learners (Burbules & Bruce, 2001; McLaughlin, 2000; Walshe, 2013). Sherrod and Wilhelm (2009) assert that in dialogue-based interactions the learners create knowledge through cooperation and facilitate each other's cognitive development through sharing ideas. For example, when one of the participants (teacher or learners) is sharing his/her views, others are listening and analyzing, and with logical reasoning either go for or against it. In an atmosphere of reflection and collective engagement, concepts, knowledge, and novel interpretations emerge among the participants.

Likewise, while knowledge is accumulated through books and other materials that the learners share among themselves, in dialogue-based interactions both sides can benefit from what others have gained leading to the extension of the frontiers of knowledge among the learners (Linell, 2009). Vygotsky believes that cognitive development, understanding problems,

and laying the groundwork for interaction and collective thinking among human beings are language-related (Wells, & Arauz, 2006). Thus, our life is dependent on our interaction and sharing of ideas with one another through listening and speaking (Fisher, 2007). In dialogue-based learning, learners get engaged in social and cultural research through interaction with their teachers and the other learners. In fact, dialogue creates a society for thinking, meaning-making, and sharing ideas (Burbules & Bruce, 2001). Freire (2007) believes that through dialogue both the teacher and the learners are responsibly involved in the process of learning. Dialogue develops critical thinking which is essential in acquiring higher levels of thinking. Moreover, Freire asserts that without dialogue interaction is impossible, and without interaction, decent education is not going to happen. Dialogue, in particular, is an effective and practical way to promote learning and a profound understanding of different problems. In addition, according to O'Connor and Michaels (2007), since some students may be more knowledgeable than the teacher regarding the subject being taught, the teacher should establish a communication network based on dialogue to investigate the students' viewpoints, reasoning, and experiences about the subject matter. Dialogue, therefore, plays a prominent role in the learning process because the participants, while sharing their ideas and analyzing their knowledge and viewpoints, examine the subject matter from different perspectives.

Regarding the findings of this research, it can be stated that learners who raise questions about the contents of the lesson during the dialogue encourage their group members to study, discuss, reflect, and comment on important issues. Furthermore, each student defends his reflections in this process by giving solid and scientific reasons, notions, and principles. Thus, they acquire the capacity required for analysis and evaluation of their own and others' opinions and reflections. In fact, dialogue reinforces thinking skills as a type of intellectual activity. Moreover, using dialogue loops offers further opportunities for information exchange, simultaneous statements of opinions and thoughts, and observation of the students' intellectual performance, and consequently facilitates the evolution of critical thinking.

Finally, in dialogue-based education, the teacher should, in a meaningful and logical manner, raise questions that result in contemplative answers and give rise to further questions (Oregon, 2009; Walshe, 2013; Worthy et al., 2012). Therefore, Mortimer and Scott (2003) have recognized this learning method as a dialogic-interactive method in which the teacher and the learners share their ideas and explore different perspectives through genuine questions.

The findings of this study have significant implications for educators and practitioners. One notable implication is that dialogue can be effectively integrated into the curricula offering

additional opportunities for practice and engagement. By incorporating dialogue into their teaching, teachers can foster life skills, such as critical thinking and self-reflection, thereby promoting learner autonomy and self-development. The participants showed interest in the dialogue-based education model which underscores the importance of catering to individual learner needs and interests. Curriculum developers can consider incorporating dialogue to enhance learner engagement. From a policy viewpoint, educational institutions and policymakers can actively support the integration of dialogue into the curricula. This integration can expand interactive learning opportunities for students. Furthermore, they should emphasize the importance of professional development for educators, ensuring they are equipped with the knowledge and skills to effectively implement dialogic models.

This study also highlights the need for future research. Long-term studies could be conducted to examine the sustainability of dialogue-based instruction and track learners' progress over an extended period. Comparative studies can provide valuable insights by comparing the effectiveness of dialogue-based education with other approaches, shedding light on their respective advantages and limitations. Additionally, investigating the effectiveness of dialogue-based instruction among diverse populations, such as teenagers and adult learners or individuals with specific learning needs, can inform its application in different educational contexts.

References

- Alexander, R. (2000). *Culture and Pedagogy: International Comparisons in Primary Education*. Oxford: Blackwell.
- Bakhtin, M. M. (1981). *The dialogic imagination: Four essays*. Austin, TX: University of Texas Press.
- Baraldi, C. (2006). New forms of intercultural communication in a globalized world. *International Communication Gazette*, 68(1), 53-69.
- Benus, M. J. (2011). *The teacher's role in the establishment of whole-class dialogue in a fifth-grade science classroom using argument-based inquiry* [Unpublished doctoral dissertation], University of Iowa.
- Bicchieri, C. (2005). *The grammar of society: The nature and dynamics of social norms*. Cambridge University Press.
- Black, P., Harrison, C., & Lee, C. (2003). *Assessment for learning: Putting it into practice*. McGraw-Hill Education (UK).

- Bloom, B. S. 1., Krathwohl, D. R., & Masia, B. B. (1984). *Taxonomy of educational objectives: the classification of educational goals*. Longman.
- Boyd, M. P., & Markarian, W. C. (2011). Dialogic teaching: Talk in service of a dialogic stance. *Language and education, 25*(6), 515-534.
- Burbules, N. C., & Bruce, B. C. (2001). *Theory and research on teaching as dialogue*. University of Illinois Press.
- Chan, L. K., & Van Kraayenoord, C. E. (1998). Learning through dialogues for students with learning difficulties. *Australian Journal of Learning Difficulties, 3*(1), 21-26.
- Chenari, M. (2008). Teaching method in Gadamer's philosophical hermeneutics. *New Educational Ideas, 4*(1), 45-62. <https://doi: 10.22051/jontoe.2008>
- Ching-Chiang, L. W., & Fernández-Cárdenas, J. (2020). Analyzing dialogue in STEM classrooms in Ecuador: A dual Socioeconomic context in a high school. *Journal of New Approaches in Educational Research (NAER Journal), 9*(2), 194-215. <https://doi.org/10.7821/naer.2020.7.529>
- Ellinor, L., & Girard, G. (2023). *Dialogue: Rediscover the transforming power of conversation*. Crossroad Press.
- Fardanesh, H. (2011). *Theoretical Foundations of Educational Technology*. Tehran: SAMT publication.
- Fisher, R. (2007). Dialogic teaching: developing thinking and meta-cognition through philosophical discussion, *Early Child Development and Care, 177* (6-7).
- Flecha, R., & Soler, M. (2013). Turning difficulties into possibilities: Engaging Roma families and students in school through dialogic learning. *Cambridge Journal of Education, 43*(4), 451-465. <http://dx.doi.org/10.1080/0305764X.2013.819068>
- Freire, P. (2007). *Education for critical consciousness*. Continuum.
- Game, A. & Metcalfe, A. (2009). Dialogue and team teaching. *Higher Education Research and Development, 28*(1), 45-57.
- Hashmyan-Nezhad, F. (2003). *Providing a theoretical framework for a critical thinking curriculum in elementary school with an emphasis on social studies curriculum*. [Unpublished doctoral dissertation]. Azad University.
- Heath, R. L., Pearce, W. B., Shotter, J., Taylor, J. R., Kersten, A., Zorn, T., & Deetz, S. (2006). The processes of dialogue: Participation and legitimation. *Management Communication Quarterly, 19*(3), 341-375.
- Juuti, K., Loukomies, A., & Lavonen, J. (2020). Interest in dialogic and non-dialogic teacher talk situations in middle school science classrooms. *International Journal of Science and Mathematics Education, 18*, 1531-1546. <https://doi.org/10.1007/s10763-019-10031-2>

- Kamali, A. Khavari, Z. (2011). Factors Affecting Critical Thinking of High School Students in Mashhad. *Sociology of Education*, 1(1), 159-190. [in Persian].
- Lai, E. R. (2011). Critical thinking: A literature review. *Pearson's Research Reports*, 6(1), 40-41.
- Linell, P. (2009). *Rethinking Language, Mind and World Dialogically: Interactional and Contextual theories of human sense-making*. USA: Information Age Publishing Inc.
- Lodge, C. (2005). From hearing voices to engaging in dialogue: Problematizing student participation in school improvement. *Journal of educational change*, 6, 125-146.
- Lyle, S. (2008). Dialogic teaching: Discussing theoretical contexts and reviewing evidence from classroom practice. *Language and education*, 22(3), 222-240.
- Mansoori, S., Nili Ahmad Abadi, M. R., Fardanesh, H., Delavar, A., & Amir Timuri, M. H. (2016). The development and validation of instructional design models based on dialogue. *Research in Teaching*, 4(1), 147-174. [in Persian].
- Marashi, S. M., Rahiminasab, H. & Lesani, M. (2008). A feasibility study on implementing philosophy teaching to children in elementary curriculum. *Educational Innovations Quarterly*, 7 (28), 8-28.
- McLaughlin, C. (2000). The emotional challenge of listening and dialogue. *Pastoral Care in Education*, 18(3), 16-20.
- Mercer, N., Dawes, L., & Staarman, J. K. (2009). Dialogic teaching in the primary science classroom. *Language and Education*, 23(4), 353-369.
- Mortimer, E. F. & Scott, P. (2003). *Meaning making in secondary science classrooms*. Buckingham: Open University Press.
- Myers, C. (2012). *Teaching critical thinking*, (Translation: Khodayar Abili). Tehran: Samt Publications. [In Persian].
- Neumann-Boxer, C. (2012). *Dialogue in educational organizations: An exploratory study of dialogue and shared vision* (Doctoral dissertation, University of Saskatchewan).
- Nistani, M. (2011). Educational Planning: Quality Improvement Strategies at the Level of an Educational Unit (School, University, Virtual Education). *Isfahan: Yar Mana publications*.
- O'Connor, C., & Michaels, S. (2007). When is dialogue 'dialogic'?. *Human Development*, 50(5), 275-285.
- Oh, R. C., & Reamy, B. V. (2014). The Socratic method and pinging: Optimizing the use of stress and fear in instruction. *Virtual Mentor*, 16(3), 182-186.
- Oregon, P. (2009). People in contexts: Families, schools, community, and cultures. *National Conference Proceedings*. National Organization for Human Services (NOHS).
- Paul, R. W., & Elder, L. (2008). Critical thinking: The nature of critical and creative thought. *Journal of Developmental Education*, 30(2), 34-35.

- Pickett, K., & Wilkinson, R. (2010). *The spirit level: Why equality is better for everyone*. Penguin UK.
- Rodriguez, J. A., Condom-Bosch, J. L., Ruiz, L., & Oliver, E. (2020). On the shoulders of giants: Benefits of participating in a dialogic professional development program for in-service teachers. *Frontiers in psychology, 11*(5). [https://doi: 10.3389/fpsyg.2020.00005](https://doi.org/10.3389/fpsyg.2020.00005)
- Roper, J., & Weaver, C. K. (2004). *Science Dialogues: The Communicative Properties of Science and Technology Dialogue: A Project for the Ministry of Research, Science and Technology*. Department of Management Communication, University of Waikato.
- Schein, E. H. (2003). On dialogue, culture, and organizational learning. *Reflections: The SOL Journal, 4*(4), 27-38.
- Scriven, M., & Paul, R. (2007). Defining critical thinking. *The Critical Thinking Community: Foundation for Critical Thinking*. Retrieved January 2, 2008, from http://www.criticalthinking.org/aboutCT/define_critical_thinking.cfm
- Shabani, H. (2008). *The impact of problem-solving methodology and working thoughts on critical thinking and academic achievement in primary school students*. [Unpublished doctoral dissertation]. Tarbiat Modares University.
- Sherrod, S. E., & Wilhelm, J. (2009). A study of how classroom dialogue facilitates the development of geometric spatial concepts related to understanding the cause of moon phases. *International Journal of Science Education, 31*(7), 873-894.
- Shor, I. (2012). *Empowering education: Critical teaching for social change*. University of Chicago Press.
- Skidmore, D. (2006). Pedagogy and dialogue. *Cambridge Journal of Education, 36*(4), 503-514.
- Tabatabaee, Z. & Mousavi, M. (2011). Investigating the impact of the P4C on critical questioning and thinking of third to fifth-grade students. *Thinking and Child, 2*(1), 73-90. [in Persian].
- Trickey, S., & Topping, K. J. (2004). 'Philosophy for children': a systematic review. *Research Papers in Education, 19*(3), 365-380.
- Vrikki, M., Wheatley, L., Howe, C., Hennessy, S., & Mercer, N. (2019). Dialogic practices in primary school classrooms. *Language and Education, 33*(1), 85-100. <https://doi.org/10.1080/09500782.2018.1509988>
- Wals, A. E., & Schwarzin, L. (2012). Fostering organizational sustainability through dialogic interaction. *The Learning Organization, 19*(1), 11-27.
- Walshe, N. (2013). Exploring and developing children's understandings of sustainable development with dialogic diaries. *Children's Geographies, 11*(1), 132-154.
- Wells, G., & Arauz, R. M. (2006). Dialogue in the classroom. *The Journal of the Learning Sciences, 15*(3), 379-428.

Wilhelmson, L. (2006). Dialogue meetings as non-formal adult education in a municipal context. *Journal of Transformative Education*, 4(3), 243-256.

Worthy, J., Chamberlain, K., Peterson, K., Sharp, C., & Shih, P. Y. (2012). The importance of read-aloud and dialogue in an era of narrowed curriculum: An examination of literature discussions in a second-grade classroom. *Literacy Research and Instruction*, 51(4), 308-322.

Appendix 1

A Guide to Teaching the Science Module in the Fifth Grade Entitled "Personal Health" in the Form of Dialogue

Prior to teaching, the students were grouped. Thus, when grouping the students, it was attempted to observe the components of ideal speech situations. First, we selected five active, motivated, and collaborative students as leaders. We then asked them each to choose one classmate as a partner. We found that they chose their classmates on the basis of friendship, intimacy, intelligence, and involvement. In the next selections, the two students, in consultation with each other, chose the next three students as their group members according to the components mentioned. After the groups were formed, the students' dialogue began.

The guide/facilitator begins the lesson with this question: "Dear students, how can we stay healthy?"

The participants respond according to what they have seen, heard, or studied. And their answers may be as much as the textbook's content. The guide's task is to extend the dialogue process beyond the content of the book, however. Accordingly, the guide should not assess the participants' responses, but should ask for reasons for their responses. The guide can also correct the misconceptions, misunderstandings, and judgments of the participants by asking a variety of questions. The guide can make use of the content of textbooks as an essential ground for initiating dialogue and producing more content through the dialogue and conversations of the participants in the teaching process. In fact, dialogue-based teaching does not confine itself to the content of the book, and a considerable part of the content is produced and reproduced from the contexts and realities of the participants' lives.

The students' primary answers to their teacher's question are: 1. Exercise 2- Sleep early 3- Drink milk 4- Brush your teeth 5- Eat a healthy diet. In fact, the students' answers are a reminder of the content of the textbook. The guide asks the students to discuss the question further within each group. After the groups of students talk to each other, one of the groups declares to be ready for dialogue.

Teacher: Asks all the students to be silent and listen to the group holding the dialogue.

SM: Sir, we must use our leisure time properly to stay healthy in every way.

Teacher: How do you spend your leisure time?

Students: With planning and entertainment.

Comment: Since the importance of planning and time management for the students has been explained in the Leisure Time module, most students find it important to have plans. For this reason, most students consider planning one of the most important components of leisure time. The teacher also asked the students to write down a list of activities they would do in their leisure time in order to consciously learn about planning in life. The students wrote activities such as playing games, watching television, having fun, going to classes, attending religious and cultural events, exercising, and studying on their lists.

Question: In order for the students to understand the importance, necessity, and benefits of leisure time and have a plan for it, the teacher told them to imagine that they would not be able to do any of the above activities during their leisure time. He asked: "What would you do then? Or what might happen to you?"

Students' Responses: We will be idle, our planning will lose its balance, we will get sick, we will get bored, we will not learn anything anymore, we will not enjoy learning, we will lose money, we will do bad things, we will become **addicted**.

Note: Finally, after a long discussion, the students pointed to the social harm of addiction in their own language. Following the process of dialogue among learners, they concluded that if they have no plan for their leisure time, they will more likely become addicted.

Teacher: Do we really need to plan for leisure time? Can we spend our leisure time without planning?

AS: Yes, we can spend our leisure time without planning. But we will not make the best of our time.

AN: Sir, I do not know how much leisure time I have.

Teacher: Do you know how much leisure time you have?

Most students were confused, and everyone wanted to guess quickly and find the right answer. Reminding them of the principle of non-judgmental dialogue, the teacher told the students to try to think about the answers they gave. After two or three minutes, one of the students said, "Sir, we have to count how many hours a day we have." Working with the students, we calculated the total number of hours in a day, as well as the time to study, eat, and rest for them. Students also completed the Planning and Leisure Worksheet with the teacher's guidance. The point was that almost the majority of students did not plan a time for religious activities such as prayer and fasting. **The teacher marked this point with a question mark (?).**

Note: Since the purpose of this dialogue was to address the social harm of addiction, the teacher needed to guide and manage the questions raised by the students on the topic of addiction. In fact, teaching through dialogue is a time-consuming process that requires the skills of management, leadership, and playing the facilitator's role.

Teacher: Well, as you mentioned, if we do not have a plan for leisure time, we might become addicted. What other factors besides a lack of plan for leisure time do you think cause us to become addicted?

Students' Responses: Friendship with degenerate friends, lack of awareness of the consequences of addiction, lack of teaching life skills by parents, drug trafficking and accessibility, going to unwholesome places such as clubs, lack of attention to parents' advice, and inefficiency of school education.

Note: The students responded to other causes of addiction by expressing the above statements as tangible meanings and even expressing concrete examples. For instance, a lack of awareness of the consequences of addiction is expressed in such statements as "those who become addicted do not know that they are addicts", or "they do not consider that other people will not like them if they become addicted."

Note: The teacher should ask the students to justify their answers; thus, it makes the students reflect on the answers they give, for instance as in the lack of awareness of the consequences of addiction. The teacher asked them how they could learn about the dangers of addiction. The students responded by **studying, consulting, and asking questions.**

Questioning: Questioning is one of the principles of dialogue that keeps the conversation going and this prevents such obstacles as hasty and biased judgment. Moreover, if students learn to ask questions about any issue, it will encourage them both to study and consult. For instance, the teacher asked the students: "What questions should we ask if we want to know about addiction?" The students asked the following questions:

“Why do we become addicted?” “What parts of our body get hurt when we become addicted?” “Why is there addiction?” “Why does not the government ban drugs?” “Why do they let opium and glass reach people?” “Why is the government not doing anything to have no more addicts in the society?” “Why do not they imprison the addicts?” “Can people prevent addiction themselves?” “Is it possible to have no addicts in our city?”

Note: The students asked these questions only after the teacher mentioned several times that they should try to ask questions rather than answer the questions.

Note: In dialogue-based teaching, the utterances and statements in the dialogue should relate to the students who are involved in the dialogue themselves since one of the goals of dialogue is to achieve self-awareness. For instance, what can we do to avoid becoming addicted?

Practical Implications of Dialogue for Students

After three sessions of discussion about leisure time and the social harm of addiction, I asked the students to report in writing and verbally to the class if they saw examples and cases related to the topic of addiction. It has been attempted to report the exact students' writings.

KS: Addicts are wandering the streets, they do not care about their parents, they do not care about anyone, and no one should trust them. And children should avoid talking to them. My father sometimes smokes things. He had started to smoke before I was born, and when I grew up, I saw it with my own eyes. It was too late to talk to my father about it. I do not know who did so to him.

SM: Our house is by the river. On Tuesday, the addicts were sitting down at the fountain and smoking heroin in a pit. I said, what are you doing in that pit, Y. After I told the officer about him, Y raised his head and ran away. Y looked back while running and the police ran after him and arrested him, but Y is brilliant because he escaped from prison.

In this case, the student was interviewed. He said that every day with two or three of his friends they go to the river and tease the addicts. I said this could be dangerous to them. He said they would call them from afar. And throw stones at them and then run away.

MK: I was at home playing with toys when my father told me to be quiet. I saw my father watching TV. I listened and became silent. Father was angry, he said, listen, so you do not become addicted. I watched on the TV a man in yellow trousers said that children become addicted. Father asked me if I understood what the man said. I also said that I learned about this in a lesson about addiction at school the other day. Father asked me what I learned. I said I would become addicted if I were curious. Again, my father asked me why I was curious. I told my teacher that some children want to know how opium works, and they become addicted out of curiosity.

In Conclusion, although this study summarizes the process of dialogue and the subjects discussed, teaching in a dialogic manner leads to a thorough examination of the subject matters within a module. For instance, in this study, the concept of addiction is examined in relation to other concepts that were all proposed by students.

Dialogue-based teaching emphasizes self-assessment more. After the dialogue-based teaching is over, the guide encourages the participants to share what they have learned through dialogue. The guide can summarize the participants' opinions in two areas, one being criticism and suggestions about the process of conducting the dialogue, and the other being changes made in the participants' perceptions and understandings before the start of dialogue.