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Exploring Learners' Facilitation Strategies in Online Discussion Forums

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Online discussion forums have the potential to contribute to the development of learners' higher order thinking by promoting writing and reflective practices within quality online learning spaces. In the Community of Inquiry framework, not only instructors but participants are expected to demonstrate teaching presence; however, research that focuses on participants' facilitation strategies remains limited. This study explored how learners adopt facilitation strategies in forums and whether such strategies foster higher order thinking. This study is situated within a broader action research project, with a particular emphasis on mediation transfer. In this study, a blended learning program was created to develop the higher order thinking of English language learners at a public high school in Japan. The intervention design was based on ecological constructivism, and the instructor's mediation was informed by sociocultural theory. Participants' forum interactions were transformed into quantitative data using three content analysis instruments. The instructor's mediation was analyzed using an original coding framework. Participants' facilitation strategies were analyzed using a qualitative interpretive approach. The data indicated that two participants who exhibited higher order thinking made use of various facilitation strategies in their interactions. This study concluded that the transfer of mediation strategies between instructor and participants could occur if instructors employ various mediation strategies as a model, and if participants understand the value of collaborative constructivist learning. A key limitation of this study is the lack of generalizability, as it was conducted within a specific context and with a small participant group, despite detailed accounts of the course design, site, and procedures.

Keywords: online discussion forums, mediation, higher order thinking, the Community of Inquiry framework

Introduction

Historically, traditional educational systems focused on providing students with the basic skills necessary to function in an industrial economy. In the case of English as a Foreign Language (EFL) classes at Japanese high schools (Grades 10–12), they often lack opportunities to foster thinking skills due to a strong emphasis on test-based instruction rooted in cognitive-behavioral theory (Nishino & Watanabe, 2008). Although Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) introduced reforms in 2018 to encourage more active, interactive, and real-world learning, their implementation has remained limited and inconsistent. However, the knowledge-based economy of today requires workers to acquire higher order thinking skills (Collins, 2014; World Economic Forum, 2023). Moreover, the field of education has been under pressure to transform itself to correspond to sociocultural changes prompted by evolving demographics, economies, and technologies (Keller, 2008). Today's educational institutions have the critical responsibility to provide learning environments that foster independent thinkers who possess the necessary skills, such as critical thinking, problem-solving, and perpetual learning, to navigate this complex world (Ally & Wark, 2020; Glassman et al., 2022). One of the methods that an increasing number of educational institutions have adopted to fulfill this goal is quality online learning.

In the rush to adopt online learning after the COVID-19 pandemic hit the world in early 2020, many online programs still reflect traditional in-person, face-to-face (F2F) lecture-format classes or traditional distance education (DE) courses (Hodges et al., 2020). Meanwhile, mainstream online learning has evolved over the past few decades, replacing the traditional in-person F2F model of knowledge transmission and self-study DE with the concept of knowledge co-construction through interaction in collaborative communities of learners (Garrison, 2016). Although synchronous interaction has its advantages, asynchronous forums, also known as online discussion forums, take a central place in quality online learning spaces due to their potential to develop participants' higher order thinking through the power of writing and reflection (Conrad & Openo, 2018; Miyashita & Wark, 2024b).

Among many other factors including ecological constructivism (Hoven & Palalas, 2016; Miyashita, 2022), learning communities (Garrison, 2016; Sanders & Lokey-Vega, 2020), and blended learning design (Graham, 2019; Vaughan et al., 2023), instructors' facilitation, or *mediation* in Vygotsky's terms, is a critical factor in making online discussion forums meaningful learning spaces. (Garrison, 2016; Lantolf, 2013; Poehner, 2007; Vaughan et al., 2013). As a

theoretical basis of mediation, the Community of Inquiry framework (COI: Garrison, 2016) and Dynamic Assessment (DA; Poehner, 2007), which emerged from Sociocultural Theory (SCT; Lantolf, 2013), are frequently referenced as key theoretical underpinnings.

The COI framework, as proposed by Garrison (2016), was developed to foster collaborative learning grounded in constructivist principles. An integral element of this framework is the concept of teaching presence, which, alongside cognitive and social presence, constitutes a key element of the COI framework. Learners require resources, engaging topics, and guiding questions to deepen their thinking. These elements are included in the teaching presence. Garrison (2016) stated that not only instructors but participants are expected to demonstrate teaching presence in online discussion forums. There are ample studies that indicate the importance of instructors' mediation; however, research that focuses on participants' facilitation strategies stays limited. The purpose of this study was to explore (1) how participants come to adopt facilitation strategies in online discussion forums and (2) whether or how participants' facilitation can contribute to the development of participants' higher order thinking in online discussion forums. Four research questions guiding this study were: (1) To what extent can higher order thinking be demonstrated among participants in online discussion forums? (2) What mediation strategies did the instructor use to develop participants' higher order thinking in online discussion forums? (3) What facilitation strategies did participants use in online discussion forums? and (4) How did participants come to employ facilitation strategies in online discussion forums?

Delimitations of the study include (1) participants were in their second year of high school in Japan (Grade 11 in the K-12 system), (2) participants were not accustomed to collaborative constructivist online learning, and that (3) the medium of instruction and communication in forums was English, which served as the participants' target language. These delimitations are described in more detail in the following Method section.

Method

Action Research

This study employed an action research methodology (Cohen et al., 2018; McNiff, 2013). There are two action research camps: the reflective practitioners' and the critical theorists' (Kemmis, 1997). The former engages action research to enhance professional practice at a local level, whereas the latter considers action research within a larger context focusing on transforming education and society. This study merged philosophies from both camps. This paper forms part of a larger action research project (Miyashita, 2022; Miyashita & Wark, 2024a; Miyashita & Wark, 2024b) and specifically focuses on mediation transfer. Although generalizability of conclusions from this study is limited due to the small number of participants learning within a specific context, description of the course design, research site, and procedures were detailed so that the conclusions can be transferable to different settings.

Description of the Teaching Context

This study was conducted at a public high school in Tokyo, Japan, where I worked. The school was designated by the Tokyo Metropolitan Board of Education as both an Advanced School, expected to achieve strong university entrance outcomes, and a School to Promote English Education. Although its curriculum aligned with that of other public high schools, it benefitted from certain privileges, such as having two native English-speaking teachers instead of the standard one. The school enrolled approximately 960 students, with around 320 per grade.

Participants

This intervention was implemented in July-August 2021 at a public school in Tokyo. Enrolled in the second year (Grade 11 in the K-12 system) at this high school, all respondents voluntarily participated in the blended learning (BL) program that I designed as an extracurricular program. The data reported upon in this study were drawn from the 16 participants who completed the synchronous and asynchronous portions of the program.

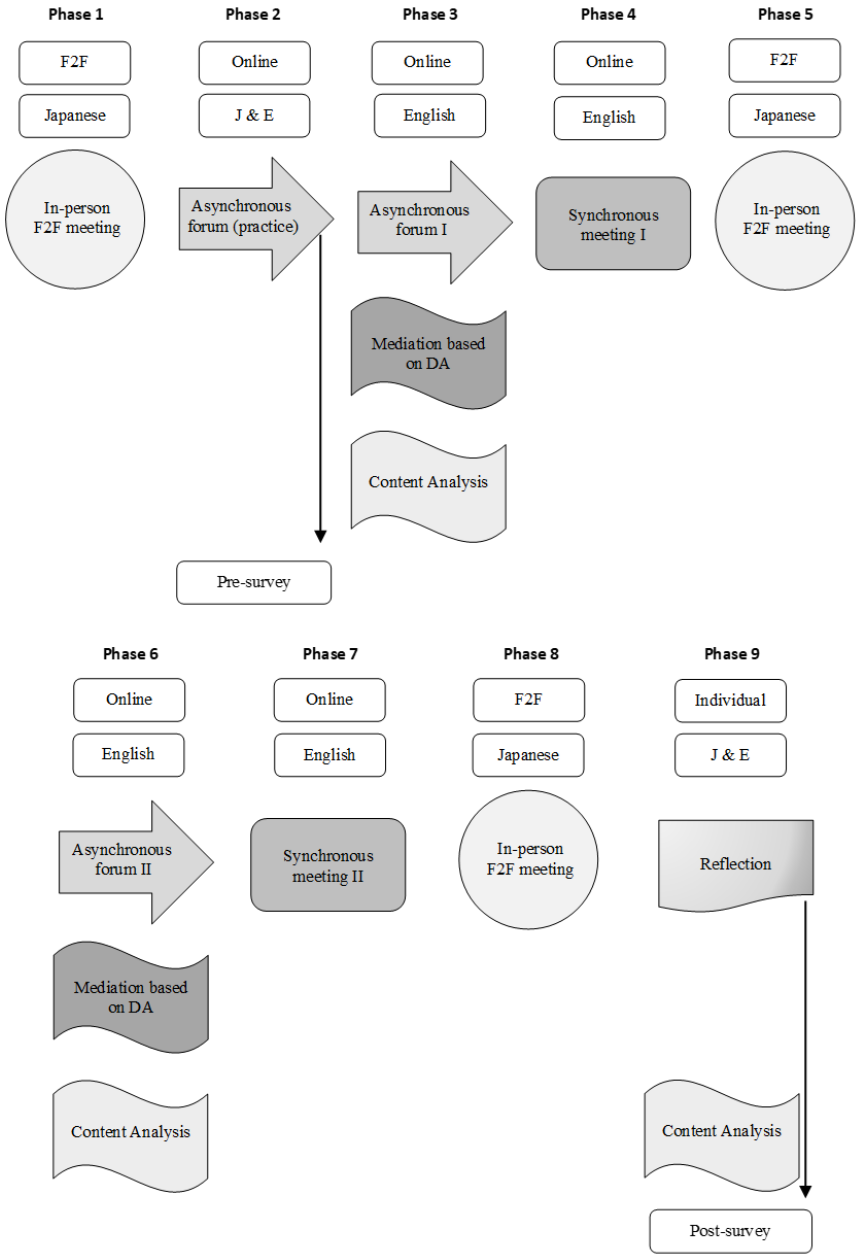
Researchers' Roles

At the time of the BL program intervention, I was working full-time as an EFL teacher at the study site. I took on the roles of the researcher, program designer, and primary asynchronous instructor in the BL program. Due to the multiplicity of my responsibilities during the design and implementation phases, I carefully considered feedback from stakeholders during the design and implementation phases. An adjunct professor engaged by universities in the U.S. was invited to join me as the primary instructor in the synchronous sessions.

Design of the Intervention

A problem that I identified as a teacher on the ground was that EFL classrooms tend to lack learning activities to develop higher order thinking due to test-oriented practices that are based on cognitive-behavioral theory at my workplace or in Japanese high school settings in general. I designed the intervention to mitigate this problem. The BL program consisted of English-based online constructivist synchronous and asynchronous learning activities, supplemented by an in-person F2F class addressing the program procedures, contents, activities, and technologies, delivered in Japanese. Although one synchronous class was planned for the beginning, middle, and end of the course, participants only attended the first class, because no one attended the optional second class, and the final class was cancelled due to the COVID-19 pandemic. A reflection period concluded the program. Figure 1 depicts the flow of this BL program.

Figure 1.
The Flow of the Blended Learning Program



Theoretical Framework

The theoretical framework used to design the BL program was constructivism. Specifically, I drew upon social constructivism for participant interactions, and ecological constructivism (Hoven & Palalas, 2016) for the connection between individual and collaborative learning and for participant reflections. Instructional meditation in the asynchronous forums incorporated sociocultural theory (Lantolf et al., 2015) and DA (Lantolf & Poehner, 2011) to promote systematic and learner-attuned mediation in the aim of developing participants' higher order thinking.

Instructional Design

In order to move beyond teacher-led acquisition-oriented learning, I chose learner-centered inquiry-based instruction as the main instructional method (Laurillard, 2012; Oktay & Yüzer, 2023; Reigeluth & Carr-Chellman, 2009). I selected a theme and guiding questions, and participants explored the topic mainly through online discussion forums and reflection. As defined by Teaching English to Speakers of Other Languages (TESOL), the teaching method also included cooperative language learning and content-based instruction (Richards & Rodgers, 2001).

Course Topic

The current socio-political climate in Japan fosters the belief in the people that English is essential for their future economic success. The program content was designed to broaden participants' perspective on the value of learning English. After discussing in two five-day online forums, participants were required to offer presentations in response to the question, "How can learning English be meaningful to me and to the world?" during the second synchronous session.

Data Collection

This study adopted three data collection instruments: asynchronous forums, a post-survey, and researcher observations. The initial asynchronous forums enabled participants to introduce themselves and practice, using the Google Classroom. As the primary instructor, I interacted with participants during the subsequent five-day forums, Forum 3 and 4. I did not mediate Forum 5, as it was designed for participants to individually reflect on their learning in the program, rather than engage in interaction. To enhance reflections on the program, participants could choose English or Japanese to respond to the open-ended post-survey questions. All participants selected Japanese, which I then translated into English for coding purposes. Observational data were obtained from field notes that I recorded throughout the study process.

Data analysis

Analyzing Participant Data to Understand Higher Order Thinking Development

Three pre-existing instruments, the Interaction Analysis Model (IAM; Gunawardena et al., 1997), Cognitive Dimension of Revised Bloom's Taxonomy (Anderson et al., 2001), and Krathwohl's Affective Domain (Krathwohl et al., 1964), were employed to translate participants' asynchronous forum postings into quantitative data. The IAM was used in Forums 3 and 4 to identify co-construction of knowledge (Gunawardena et al., 1997). The Cognitive Dimension taxonomy identified simple to complex thinking (Krathwohl, 2002), and the Affective Domain taxonomy identified affective reasoning from community-building to higher functions related to metacognition in Forums 3, 4, and 5. In addition, I took a qualitative interpretive approach because content analysis cannot capture all the aspects of human thoughts and cannot avoid involving subjective or arbitrary divisions to a certain extent (Gunawardena et al., 1997).

Analyzing Instructor Data to Design a Mediation Model

Although pre-existing instruments were used to code participant interactions, I created an original coding framework for analyzing my instructional mediation strategies, inductively generating categories from the raw data (Miyashita & Wark, 2024a). I identified the unit of analysis as a set of mediation strategies, which sought to facilitate on-going discussion and participants' higher order thinking (Rourke et al., 2001). I began by open coding (Cohen et al., 2018) the raw data, which yielded 20 strategy-based codes. I then employed axial coding (Cohen, et al., 2018) to sort the 20 codes into four broad categories: (1) Cognitive-Related, (2) Affective-Related, (3) Co-construction-Related, and (4) Overarching (personal perspectives, spanning across the first three categories). Table 1 provides definitions and examples for each code.

Table 1
Framework to Analyze the Instructor's Mediation Strategies: Codes, Definition, and Examples

Code	Definition and Examples
Affective-Related	
A: Encouraging Opinions	I encouraged participants to express their thoughts. e.g., "Hey boys and girls, don't be shy. The discussion will naturally develop later, so your first post can be a brief one.
B: Praise	I praised participants' posts. e.g., "It is nicely done."
C: Agreement	I expressed my agreement with participants. e.g., "I agree with you when you say not everyone needs English."
D: Gratitude	I expressed my gratitude to participants. e.g., "Thank you for the post and also questions to your friends."
E: Sympathy	I expressed my sympathy to participants. e.g., "I am sorry to hear that you have had a technical problem. It is always annoying."
F: Interaction	I provided social interaction that is not task-oriented. e.g., "Also, as a teacher in charge of T&F team, I happen to know what you did yesterday."
G: Stress Reduction	I attempted to reduce participants' stress. e.g., "I have posed several questions to you. I appreciate it if you could try to answer one of them."
H: Feedback	I provided feedback on participants' personal development. e.g., "Now you realize both the advantages and disadvantages."
Cognitive-Related	
A: Examples	I provided examples. e.g., "Here is one example that is observed in our everyday life: *omotenashi*."
B: Perspectives	
Different Perspectives	I provided different perspectives. e.g., "Interestingly, however, not a few people study English hard just for tests without trying to use it in authentic situations."
Restating Perspectives	I restated participants' post from broader perspectives to help participants see what they wrote from a meta level. e.g., "Games are used for various reasons including to improve English proficiency. It is called gamification. It must be a good starting point."
C: New Knowledge	I provided new knowledge.
Basic	e.g., "Learning and using must be "the two wheels of the car" when we learn a foreign language."
Intermediate	e.g., "One of the biggest reasons why a particular language is used in a particular region is power."
Advanced	e.g., "Culture is not static. Any culture is transformed into a different one."
D: Supplementary Explanation	I provided supplementary explanation. e.g., "He used the word "power" in his post. Let me explain what the word means when it is used in the context of English as a global language, describing how it is going in Japan as an example."
E: Additional Resources	I provided additional resources. e.g., "Here is an interesting TED talk (about 14 minutes) for us to think about what our native language means to us."

Code	Definition and Examples
Co-construction-Related	
A: Connecting	I attempted to connect participants. e.g., "The 'feeling' part resonates with XX's latest post."
B: Questioning	I asked participants questions.
Basic	e.g., "Imagine you have to stay in a foreign country for a year. What would you miss? Two or three possible examples?"
Intermediate	e.g., "Do you think the world would be a better place if all the people on this planet used only one language? Why or why not?"
Advanced	e.g., "XX used the word 'freedom' when he talked about this issue in Zoom Meeting 1. Freedom! Do we have freedom? What does freedom exactly mean?"
C: Objecting	I indirectly objected to participants opinions. e.g., "ELF has possibilities to make the world a better place as stated above, but it might be a double-edged sword. For example…"
D: Summarizing	I restated or summarized participants' posts to show that I understood what they wrote. e.g., "You stated there are English words that cannot be literally translated into Japanese (and vice versa) and you can learn the culture by learning the language."
E: Changing Topics	I attempted to change topics. e.g., "Here, however, I would like to direct your attention to the second paragraph of XX's."
F: Summarizing Discussion	I summarized ongoing discussions. e.g., "Hi all, so far, we have been focusing on XX's post and the first paragraph of YY's. The topic is mainly about world Englishes or lingua franca."
Overarching	
Personal Perspectives	I provided personal opinions, experiences, or suggestions for various purposes including building social relationship, stretching participants' cognition/metacognition, and providing different perspectives.
Basic	e.g., "My iPhone froze yesterday, and it took long for me to solve the problem. I see the great possibilities in online learning, but technological problems are always with us, and it is annoying."
Intermediate	e.g., "This is not a black-or-while problem. Each of us are encouraged to find a fine balance. To see things from various perspectives must be a key for us to be a mature citizen."
Advanced	e.g., "I agree that we can learn a lot by learning English (or any other languages), but one thing that I would like you all to learn by learning English is what a (native) language means to you."

Coding Reliability

A second coder collaborated with me throughout the coding process to support reliability; however, inter- or intra-rater reliability was not calculated, as all coding was conducted together. We reviewed related literature to deepen our understanding of existing frameworks, and for the original framework, I provided explanations before we began coding. Each item was coded jointly, with decisions made through discussion and consensus.

Analyzing Participant and Instructor Data to Explore the Transfer of Mediation Strategies

To analyze the transfer of instructor's mediation strategies to participants in online discussion forums, the framework developed by the author (Miyashita, 2024a) was applied. Subsequently, a qualitative interpretive approach was adopted. I did not take a quantitative approach here because the number of participants and gathered qualitative data were not large enough to produce valid results (Cohen et al., 2018). Instead, I closely read all these qualitative data to identify factors that might have enabled or constrained mediation transfer.

Ethical Requirements
After securing written approval from the school principal, I distributed consent forms to participants (aged 16–17) and their guardians. The program's aims, advantages, and risks were explained in advance, and voluntary participation with the option to withdraw at any time was emphasized.

Result

Quantitative Result from Analysis 1: Participants' Higher Order Thinking Development

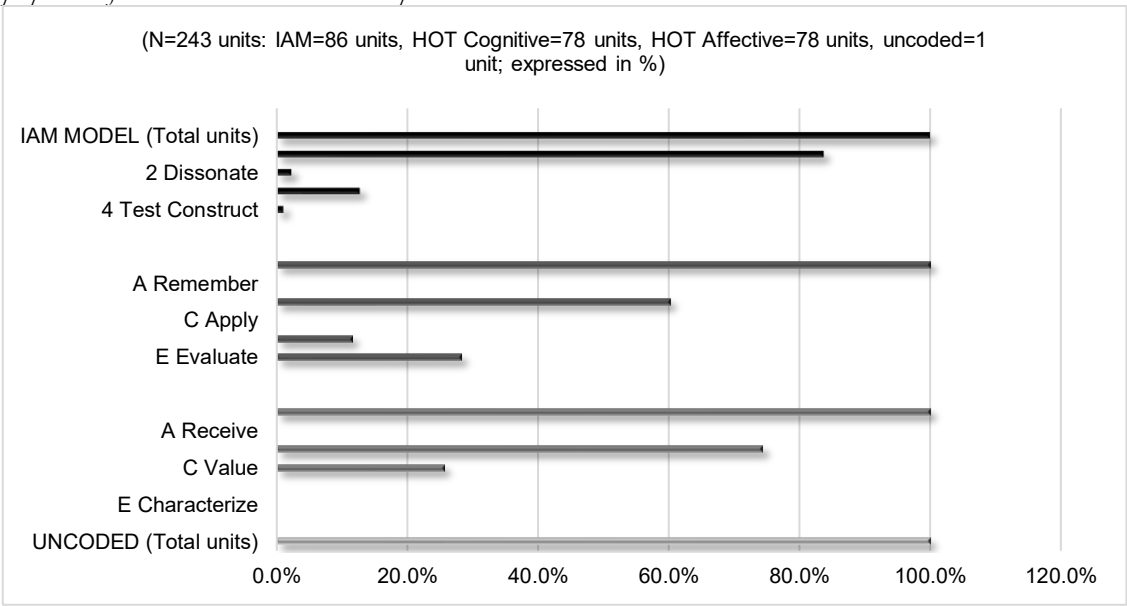
Basic Data
Data from Forum 3 and 4 were collected from the 16 participants and me, the primary asynchronous instructor. On average, each Forum 3 participant posted 2.3 messages, and in Forum 4, this average was 1.6. Total word averages per post was 121.8 words in Forum 3 and 121.4 in Forum 4. My total number of posts was 22 in Forum 3 and 24 in Forum 4. My total word average per post was 169.9 in Forum 3 and 173.3 in Forum 4.

As for the direction of participants' posts (to prompts, to other participants, to instructors, or to others), 13 posts in Forum 3 (35.1% of all Forum 3 posts) and 14 posts on Forum 4 (56.0% of all Forum 4 posts) were responses to prompts. Bullen (1997) categorized forum messages into two groups: independent (messages responding to a discussion topic, but do not refer to any other messages), and interactive (messages that reference other forum messages to advance the discussion). Using Bullen's terms, most participants posted independent messages. Fewer participants submitted interactive messages directed towards other participants (n=7 in Forum 3 and n=4 in Forum 4).

Forum 3
Statistical data expressed as percentage in this section were rounded to the nearest tenth of a percent. The IAM had five parent codes: Phase I: Share-Compare, Phase II: Dissonate, Phase III: Negotiate-Construct, Phase IV: Test Construct, and Phase V: New Knowledge. The Cognitive Dimension had six parent codes: (A) Remember, (B) Understand, (C) Apply, (D) Analyze, (E) Evaluate, and (F) Create. Finally, the Affective Domain consisted of five parent codes: (A) Receiving, (B) Responding, (C) Valuing, (D) Organizing, and (E) Characterizing.

The total number of participant message in Forum 3 was 79. Among them, eight were double-coded, and one was uncoded. This produced a total of 86 IAM units coded from this forum. Seventy-two units (83.7% of all units coded to IAM) were coded to Phase I, two units (2.3%) to Phase II, 11 (12.8%) to Phase III, and one (1.2%) to Phase IV. In the Cognitive Dimension, none were double-coded, and one was uncoded from the 79 messages, producing a total of 78 units. Forty-seven (60.3% of all Cognitive Dimension units) were sorted to (B) Understand, nine (11.5%) to (D) Analyze, and 22 (28.2%) to (E) Evaluate. The Affective Domain yielded a total of 78 units. Fifty-eight (74.4% of all Affective Domain units) belonged to (B) Responding and 20 (25.6%) to (C) Valuing.

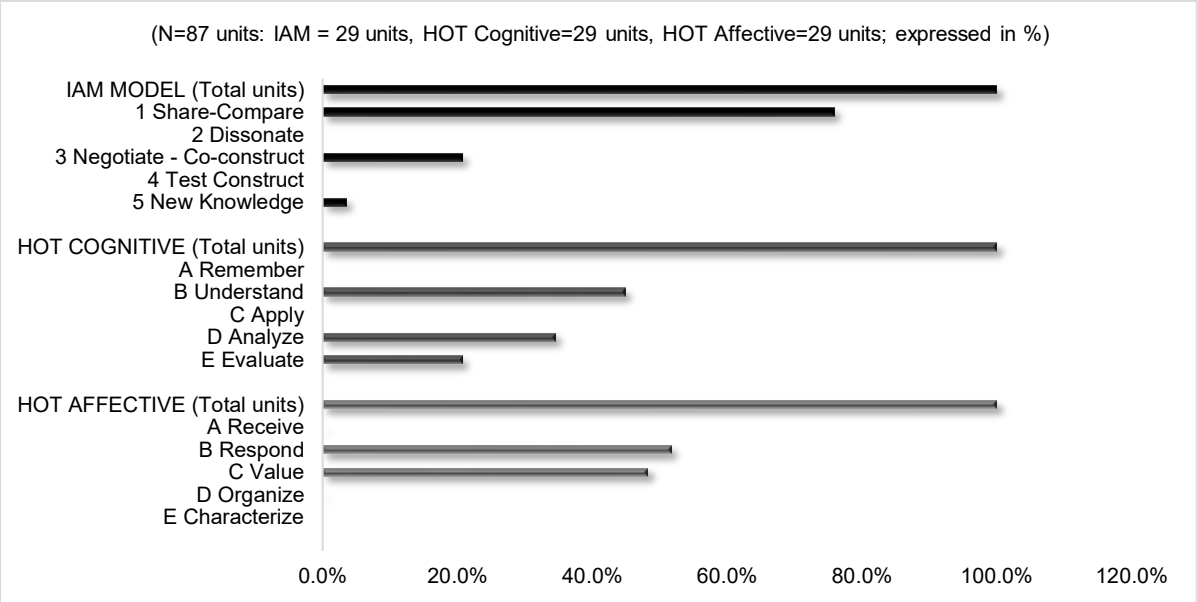
Figure 2.
The proportion of coded units in Forum 3: Participants



Forum 4

The total number of participant messages in Forum 4 was 29. Since none were double-coded or uncoded, these messages produced a total of 29 units each for the IAM, Cognitive Dimension, and Affective Domain. Twenty-two of the 29 IAM units (or 75.9% of all IAM units) were sorted to Phase I, six (20.7%) to Phase III, and one (3.4%) to Phase V. Thirteen of the 29 Cognitive Dimension units (or 44.8% of all Cognitive Dimension units) were assigned to (B) Understand, 10 (34.5%) to (D) Analyze, and six (20.7%) to (E) Evaluate. In the Affective Domain, 15 (or 51.7% of all Affective Domain units) were allocated to (B) Responding and 14 (48.3%) to (C) Valuing.

Figure 3.
The proportion of coded units in Forum 4: Participants



Quantitative Result from Analysis 2: Instructor's Mediation Strategies

Forum 3

My Forum 3 contributions produced 68 units that were distributed into Affective-Related categories. Of these, four (or 5.9% of all units coded to Affective-Related) belonged to (A) Encouraging Opinions, 26 (38.2%) to (B) Praise, 15 (22.0%) to (C) Agreement, 13 (19.1%) to (D) Gratitude, one (1.5%) to (E) Sympathy, five (7.4%) to (F) Interaction, three (4.4%) to (G) Stress Reduction, and one (1.5%) to (H) Feedback.

There were 34 Cognitive-Related units. Three (or 8.8% of all units coded to Cognitive-Related) were allocated to (A) Examples, 15 (44.1%) to (B) Perspective: five to Different Perspectives and 10 into Restating Perspectives. Thirteen units (38.2%) were sorted to (C) New Knowledge: two to Basic, two to Intermediate, and nine to Advanced. Two units (5.9%) belonged to (D) Supplementary Explanation, and one (2.9%) to (E) Additional Resources.

There was a total of 29 Co-construction-Related units. Of these, nine (or 31.0% of all units coded to Co-construction-Related) were allocated to (A) Connecting, 13 (44.8%) to (B) Questioning: four to Basic, six to Intermediate, and two to Advanced. Three units (10.3%) belonged to (C) Objecting and four (13.8%) to (D) Summarizing. Overarching consisted of one sub-category, Personal Perspectives. Nineteen units were distributed to this category: 11 to Basic, six to Intermediate, and two to Advanced.

Forum 4

In Forum 4, 76 units were coded to the category, Affective-Related. Of these, five (or 6.6% of all units coded to Affective-Related) were distributed to (A) Encouraging Opinions, 20 (26.3%) to (B) Praise, 18 (23.7%) to (C) Agreement, 14 (18.4%) to (D) Gratitude, two (2.6%) to (E) Sympathy, five (6.6%) to (F) Interaction, five (6.6%) to (G) Stress Reduction, and seven (9.2%) to (H) Feedback.

There were 27 Cognitive-Related units. Three (or 11.1% of all units coded to Cognitive-Related) were sorted to (A) Examples, nine (33.3%) to (B) Perspective (four to Different Perspectives, and five to Restating Perspectives), 11

(40.7%) to (C) New Knowledge (three to Intermediate, and eight to Advanced), two (7.4%) to (D) Supplementary Explanation, and two (7.4%) to (E) Additional Resources.

Of the total of 35 units assigned to the Co-construction-Related category, eight (or 22.9% of all units coded to Co-construction-Related) were allocated to (A) Connecting, 19 (54.3%) to (B) Questioning (two to Basic, five to Intermediate, and 12 to Advanced), three (8.6%) to (C) Objecting, one (2.9%) to (D) Summarizing, one (2.9%) to (E) Changing Topics, and three (8.6%) to (F) Summarizing Discussion. Twenty-two units were distributed to the singular child code in Overarching, Personal Perspectives (three to Basic, nine to Intermediate, and 10 to Advanced).

Qualitative Result from Analysis 3: Facilitation Strategies Employed by Participants

To explore what facilitation strategies participants used in forums, one example of learner-learner interaction, which is shown in Table 2, was closely examined. This is an interaction between P3 and P10 in Forum 3. These two participants stood out in both forums, actively interacting with other participants and the instructors to generate more higher order thinking units coded to all analysis models than the other participants did. The coding results with three instruments were inserted in bold after each unit of analysis in their contributions.

Table 2
Example of Learner-Learner Interaction with Coding Results

Turn	Participant	Post
1	P10	Hi P3, I have read your post and I totally agree with you. I have a Japanese friend who works as a journalist. She travels all over the world to know what's happening in each of the countries she goes to, but it seems like she has never had a problem with not being able to communicate with people, even when she went to a small village in Africa. **[(B) Responding in Affective Domain / (B) Understand in Cognitive Dimension / Phase I in IAM]** I think it'll be really nice if you can enjoy books, movies and music in English, too! **[(B) Responding in Affective Domain / (B) Understand in Cognitive Dimension / Phase I in IAM]** Lastly, since you've mentioned that you can learn cultures when studying English, can you think of any other examples about this? **[(B) Responding in Affective Domain / (B) Understand in Cognitive Dimension / Phase I in IAM]**
2	P3	Hi, P10. Thank you for your reply. I read your Japanese friend's experience. And I felt your idea is also true. I think we can communicate with foreigners even if we do not have enough English speaking skills because we can communicate with strong will. **[(C) Valuing in Affective Domain / (D) Analyze in Cognitive Dimension / Phase III in AIM]** I think words are influenced by cultures or customs. So If we learn word's origin, we can naturally know cultures or customs of the country. **[(B) Responding in Affective Domain / (B) Understand in Cognitive Dimension / Phase I in IAM]**
3	P10	Interesting, P3. Strong will is very important when you communicate with people, but what do you think is important as well as your strong will when communicating? **[(B) Responding in Affective Domain / (B) Understand in Cognitive Dimension / and Phase I in IAM]** Yes. That's right. A lot of words came from other countries such as France. Likewise, I think learning Japanese will also be a good opportunity to know different cultures because we have so many words from overseas, too. **[(C) Valuing in Affective Domain / (D) Analyze in Cognitive Dimension / Phase III in AIM]**
4	P3	Hi, P10. Thank you for your reply. I think smile is also important because If we smile while talking, people will relax and feel good impression. What do you think? Please tell me your opinion that important thing to communicate with people. **[(C) Valuing in Affective Domain / (E) Evaluation in Cognitive Dimension / Phase I & III in AIM]**
5	P10	Thanks for the question, P3. As you said, smiling is important when talking to people. Another thing that I think is crucial is hand gestures. I guess Japanese people tend not to use as much of them as English speakers when they are speaking Japanese, but I think hand gestures will make you much more persuasive. If you have a look at TED, you will immediately notice the way used to convince the audience! **[(C) Valuing in Affective Domain / (E) Evaluation in Cognitive Dimension / Phase III in AIM]**

Coding results showed that the two participants demonstrated their higher order thinking in this interaction. Both the participants, especially P10, used various strategies to facilitate the discussion. To explore what strategies P3 and P10 employed in this interaction and to examine the instructor-participant transfer of mediation strategies, the framework developed by the author (Miyashita, 2024a) was applied in this study.

In the first message in Turn 1, P10 used (C) Agreement in Affective-related, saying, "I have read your post and I totally agree with you." Then, he used (A) Personal Perspectives in Overarching, providing an example that came from his personal experience, saying, "I have a Japanese friend who works as a journalist … but it seems like she has never had a problem with not being able to communicate with people, even when she went to a small village in Africa." In the second message in Turn 1, P10 used (C) Agreement in Affective-related and (D) Summarizing in IAM-related, saying, "I think it'll be really nice if you can enjoy books, movies and music in English, too!" In the third message in Turn 1, he used (D) Summarizing in IAM-related and (B) Questioning in IAM-related, saying, "Lastly, since you've mentioned that you can learn cultures when studying English, can you think of any other examples about this?"

In the first message in Turn 2, P3 used (D) Gratitude in Affective-related and used (C) Agreement in Affective-related, stating, "Hi, P10. Thank you for your reply. I read your Japanese friend's experience. And I felt your idea is also true." Then, inspired by the example provided by P10, P3 brought a new concept, strong will, arguing, "I think we can communicate with foreigners even if we do not have enough English-speaking skills because we can communicate with strong will." In the second message in Turn 2, P3 replied to P10's question directly, saying, "I think words are influenced by cultures or customs. So [i]f we learn word's origin, we can naturally know cultures or customs of the country."

In the first message in Turn 3, P10 used (B) Praise in Affective-related, stating, "Interesting, P3." Then, he employed (C) Agreement in Affective-related and (B) Questioning in IAM-related again, saying, "Strong will is very important when you communicate with people, but what do you think is important as well as your strong will when communicating?" In the second message in Turn 3, P10 used (C) Agreement in Affective-related and (A) Examples in Cognitive-related, stating, "Yes. That's right. A lot of words came from other countries such as France." Then, he employed (B) Different Perspectives in Cognitive-related, shifting the focus of discussion to participants' native language, Japanese, arguing "Likewise, I think learning Japanese will also be a good opportunity to know different cultures because we have so many words from overseas, too."

At the beginning in Turn 4, P3 used (D) Gratitude in Affective-related and replied to P10's question, stating, "Hi, P10. Thank you for your reply. I think smile is also important because [i]f we smile while talking, people will relax and feel good impression." Then, she employed (B) Questioning in IAM-related, saying, "What do you think? Please tell me your opinion that important thing to communicate with people."

At the beginning in Turn 5, P10 used (D) Gratitude in Affective-related and (C) Agreement in Affective-related, stating, "Thanks for the question, P3. As you said, smiling is important when talking to people." Then, P10 used (B) Different Perspectives in Cognitive-related, bringing a topic of hand gesture, stating, "Another thing that I think is crucial is hand gestures." He used (D) Supplementary Explanation in Cognitive-related, in elaborating on the new topic, arguing, "I guess Japanese people tend not to use as much of them as English speakers when they are speaking Japanese, but I think hand gestures will make you much more persuasive." At the end of this post, P10 employed (A) Examples, suggesting that P3 watch a video clip to confirm his argument, saying, "If you have a look at TED, you will immediately notice the way used to convince the audience!"

Discussion

Research Question 1

The first research question was: To what extent can higher order thinking be demonstrated among participants in online discussion forums? Based on the coding results of participants' transcripts (Analysis 1), although learner-learner interaction was not high overall, participants demonstrated higher order thinking development. Forum 4 contained more higher category units than Forum 3. Two participants responded well to my facilitation strategies, interacting more actively with other participants and the instructors than other participants did. These two participants produced a greater number of higher order units in each coding instrument than the other participants did.

In addition, further review of post-survey data, participant transcripts, and observational notes suggested that even the participants who contributed few messages may have thought deeply. For instance, one participant offered only one post in Forum 3 and none in Forum 4. Yet, in the post-survey, this participant stated, "After I made a post, the instructor sent me an article that was related to what I said in my post. By reading the article, I was pushed to think about the matter more deeply. It was an interesting experience." The participant also wrote, "It was interesting to think

why we learn English, using English. It was a good topic because I was very motivated to learn English." As the asynchronous instructor, I offered feedback on new knowledge, related learning resources, and alternate perspectives to participants. This participant's post-survey response implied that, despite the infrequency of their posts, they may still have exercised, or potentially developed, their higher order thinking.

Research Question 2

The second research question was: What mediation strategies did the instructor use to develop participants' higher order thinking in online discussion forums? Responses to this question was addressed in Analysis 2, wherein I detailed the type of mediation strategies used in the forums in addition to how an inductive process was used to develop a framework to analyze these strategies (see Table 1). In summary, the instructor mediation framework contained four parent codes (1) Affective-Related, (2) Cognitive-Related, (3) Co-construction-Related, and (4) Overarching. Affective-Related had eight child codes: (A) Encouraging Opinions, (B) Praise, (C) Agreement, (D) Gratitude, (E) Sympathy, (F) Interaction, (G) Stress Reduction, and (H) Feedback. Cognitive-Related had five child codes: (A) Examples, (B) Perspectives, which was further divided into Different Perspectives and Restating Perspectives, (C) New Knowledge, sub-divided into Basic, Intermediate, and Advanced, (D) Supplementary Explanation, and (E) Additional Resources. Co-construction-Related included six child codes: (A) Connecting, (B) Questioning, which was further divided into Basic, Intermediate, and Advanced, (C) Objecting, (D) Summarizing, (E) Changing Topics, and (F) Summarizing Discussion. Overarching had only one category, Personal Perspectives, sub-divided into Basic, Intermediate, and Advanced.

Some mediation strategies spanned across two or more categories. For instance, Questioning was allocated to Co-construction-Related, because this strategy was used primarily for the social construction of knowledge. However, this strategy might also impact participants' affect and cognition. Thus, the four broad categories in this framework do not represent clear distinctions; they have overlaps.

I referred to Vaughan et al.'s (2013) classification of facilitation strategies, which were based upon the COI framework (Garrison, 2016), because the Co-construction-Related and Cognitive-Related strategies in my framework closely related to this classification. Although strategies for mediating affective presence were not explicit in Vaughan et al.'s (2013) classification, some affective strategies could be identified in their classification. Because the Affective Domain was used to analyze participants' data in this study, I made affective mediation strategies explicit in my framework.

Another salient element for instructors to incorporate into their mediation is the notion of contingency. Training and experience can help instructors to provide flexible and appropriate strategies to control learners' cognitive demand and other related factors by closely observing and assessing learners' abilities and motivations in the moment (Gibbons, 2003).

Research Question 3 & 4

The third research question was: What facilitation strategies did participants use in online discussion forums? Related to this question, the fourth research question was: How did participants come to employ facilitation strategies in online discussion forums?

As shown in Table 2, the two participants, P3 and P10, employed various strategies in all three categories: Affective-related, Cognitive-related, and IAM-related. Exactly what strategies worked is not known, but it is highly likely that their active use of these strategies was one of the reasons why they could activate their discussion, which led both to produce more higher order units in all three coding instruments than the other participant did. This could be a good example of not only instructors but also participants having the capacity to increase teaching presence (Garrison, 2016).

With regard to why these two participants could use various facilitation strategies, I derived three inferences from the qualitative analysis. Firstly, the two participants might originally have had the ability. In the case of P10, he lived and studied in Australia for one year just before joining this program in Japan. He might have developed his communication skills including facilitation skills while living in a different culture, which could be inferred from his contributions in this program. For example, he wrote in Forum 4, "In Australia, on the other hand, there are so many different people from so many different countries, and so many different values. Therefore, in this community where people from different cultures coexist, you need to be able to communicate your values and opinions clearly to others, as others wouldn't understand you as well as when you are in Japan."

Secondly, the direct instruction on how to build a constructive discussion that I gave participants in the first in-person F2F meeting at the beginning of this program might have worked. One participant wrote in the post-survey, "Thanks to the F2F meeting where we learned how to post and interact on Google Classroom by doing it, I could easily do it

at home later." Another participant wrote, "It was also good because we wrote our opinions and made posts during the meeting. I could concentrate and get motivated due to that atmosphere." I also posted basic principles to build a constructive discussion on the employed platform for participants to be able to refer to anytime. The post-survey revealed that no participants found anything uncomfortable while discussing in forums. In general, learners in forums could make other participants feel uncomfortable by, for example, being aggressive or rude; therefore, these instructions are important especially if participants are K-12 students or for those who are not accustomed to learning in forums (Halverson et al., 2017). This strategy appears to have worked in this program.

The last inference is that they might have modeled the instructor's mediation strategies; namely, the instructor-participant transfer of mediation strategies occurred in this program (Garrison, 2016). I actively joined in Forum 3 and 4 and used various mediation strategies in both forums as described in the Result section. I replied to all of the participants' original posts and to most of their further contributions. I utilized mediation strategies grounded in DA (Lantolf & Poehner, 2004), a process-oriented approach that integrates ongoing evaluation with responsive support. Mediation was tailored to each participant's Zone of Proximal Development (ZPD; Lantolf, 2011), balancing challenge with real-time insight into their cognitive abilities and motivation. One participant, P16, commented on my role as a model in the post survey, saying, "I struggled at first because I was not sure how I should reply to others, but seeing [instructor] replying to every post, I could understand what we were expected." Although I gave participants direct instruction about how to build a constructive discussion in forums in the first in-person F2F meeting and opportunities to practice with easy tasks, some participants might still have had difficulty in interacting in the main forums. P16's comment implies that my replies and comments to forums might have worked as a model for them to be better involved in forums.

P3 and P10 in Table 2 had never experienced this kind of constructivist online learning; thus, it is highly likely that they modeled my mediation strategies consciously or unconsciously to function in forums. Forum 5, a forum designed for participants to individually reflect on their learning in the program, and the post-survey indicates that P3 and P10 found collaborative constructivist learning to be meaningful. For example, two comments below implies that P3 and P10 understood the essence of collaborative constructivist learning after experiencing it. P3 wrote in Forum 5:

> I think we need to understand something first, but just memorizing things is meaningless. In that sense, this way of learning is very meaningful. The process in which we learn, think, and express what we thought is important. This kind of learning should be incorporated in regular classes … At first, to be honest, I was not so positive about joining this program. However, I gradually came to enjoy this program after getting replies to my posts…I think this program developed my positive attitude.

P10 wrote in the post survey:

> By participating in the programme, I learned that people can work together, regardless of how well they use English …Of course, English is very important, but I think what the participants really needed was the ability of logically expressing their own thoughts in the forums and the meetings. This is particularly important when it comes to working in an international environment. Although there must be some difference in skill levels, job descriptions or even cultural backgrounds among the employees, it will be even more important to cooperate with them to tackle on problems. In that sense, this programme meant a lot to me.

To be more specific with regard to mediation strategies, I intentionally provided participants with different perspectives for their metacognition to be expanded. Comments that explicitly valued this aspect came from three participants, including P10. P10 wrote in the post survey, "X [me: the instructor] and Y [the co-instructor] have different backgrounds from ours. By being exposed to their ways of thinking and their knowledge, I often found different perspectives and was led to deeper thinking." Gaining broader perspectives and transforming cognitive schema while working together is one prominent advantage of collaborative constructivist learning (Conrad & Openo, 2018; Gunawardena et al., 1997). In the interaction in Table 2, P10 used facilitation strategies related to this three times: one Personal Perspectives in Overarching and two Different Perspectives in Cognitive-related. P10's comments and his actual use of the facilitation strategies suggest that the instructor-participant transfer of mediation strategies occurred after the instructor's intentional and active use of mediation strategies and the participant's understanding of the value of collaborative constructivist learning.

The participants lacked prior experience with constructivist learning, including asynchronous online forums. This absence may have influenced the study outcomes, as prior exposure and reduced online interaction barriers might have led to different results. Incorporating asynchronous forums gradually into traditional face-to-face classes could help students acclimate to constructivist methods. In facilitating such forums using various mediation strategies, the

principle of contingency emerges as a key instructional technique (Gibbons, 2003). Training instructors to adaptively respond to learners' needs through real-time observation and assessment of cognitive demand, motivation, and other factors can enhance mediation effectiveness.

Conclusion

To conclude this study, this study introduced a framework to explore mediation strategies, conceptualized as a mediation model (see Table 1). This model was developed inductively by generating categories from the raw data. The unit of analysis was defined as a set of mediation strategies aimed at fostering ongoing discussion and encouraging higher order thinking among participants. Initial open coding of the data (Cohen et al., 2018) produced 20 distinct codes. These codes were subsequently organized into four broad categories through axial coding (Cohen et al., 2018), guided by Vaughan et al.'s (2013) classification: (1) Cognitive-Related, (2) Affective-Related, (3) Co-construction-Related, and (4) Overarching. Definitions and examples for each code were provided in Table 1. The findings suggested that contingent and purposeful mixture of three types of mediation, for encouraging affective expression, for developing participants' cognition, and for increasing social interaction, appear to stretch participants' thoughts in forums (Garrison, 2016; Vaughan et al., 2013).

In addition, closer examination of participants' contributions revealed that two participants who developed their higher order thinking through learner-learner interaction employed various facilitation strategies during their exchanges. These findings suggest that not only instructors but also participants can contribute to increasing teaching presence (Garrison, 2016). Although there must be other factors to develop participants' ability to facilitate discussion in online forums, including participants' preacquisition of the strategies or instructors' direct instruction, this study reinforces the argument that instructors' modeling is important. The instructor-participant transfer of mediation strategies could occur if instructors employ various mediation strategies as a model, and if participants understand the value of collaborative constructivist learning. Through instructor modeling, even participants with limited or no experience in online forums may begin to facilitate discussions by gaining the vivid image of how to develop discussion in written language. Instructors might be able to decrease their involvement in forums once the discussion begins to be activated among participants; however, instructors are encouraged to continue providing mediation for two key purposes, particularly for novice participants: (1) to mediate participants' cognitive development and (2) to be a model for participants to learn how to be better involved in online discussion forums.

One fundamental challenge is that the value of online discussion forums may not be fully recognized in academic environments that predominantly rely on traditional knowledge transmission models. To address this, it is desirable for educational institutions to gradually embrace and encourage the integration of collaborative constructivist learning approaches. Understandably, instructors often remain within their comfort zones when it comes to pedagogical methods (Heimlich & Nordland, 2002; Owens, 2013). As a practical starting point, instructors accustomed to lecture-based formats could consider introducing a trial discussion forum into their programs. However, even when teachers are willing to explore new methods, time constraints and numerous responsibilities can present significant challenges. A potential solution is to foster collaboration between researchers and experienced educators during both the design and implementation stages of such initiatives. The term, model, was defined in this study as a systematic categorization that can be handily adopted in practice. The mediation model proposed in this study may assist novice instructors in effectively facilitating discussion forums.

When implementing online discussion forums, instructors are encouraged to recognize the power dynamics that their presence may impose on participants. Instructor engagement appears to be necessary to facilitate cognitive development in forums (Garrison, 2016); however, instructor involvement can also have detrimental effects (Cohen et al., 2018). For example, instructors' mediation in forums can intentionally or unintentionally manipulate participants' thoughts. An essential principle is that participants should be able to respectfully disagree with instructors or other participants without fear of negative consequences.

References

Ally, M., & Wark, N. (2020). Sustainable development and education in the fourth industrial revolution. *Commonwealth of Learning: OAsis*. http://oasis.col.org/handle/11599/3698

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). A taxonomy for learning, teaching, and assessing. New York Longman.

Bullen, M. (1997). A case study of participation and critical thinking in a university-level course delivered by computer conferencing. [Unpublished doctoral dissertation]. The University of British Columbia. https://doi.org/10.14288/1.0056000

Cohen, L., Lawrence, M., & Morrison, K. (2018). Research methods in education (8th ed.). Routledge. https://doi.org/10.4324/9781315456539

Collins, R. (2014). Skills for the 21st Century: teaching higher-order thinking. *Curriculum & Leadership Journal, 12*(14).

Conrad, D., & Openo, J. (2018). *Assessment strategies for online learning: Engagement and authenticity*. AU Press. https://doi.org/10.15215/aupress/9781771992329.01

Garrison, D. R. (2016). *E-learning in the 21st century: A community of inquiry framework for research and practice* (3rd ed.). Routledge. https://doi.org/10.4324/9781315667263

Gibbons, P. (2003). Mediating language learning: Teacher interactions with ESL students in a content-based classroom. TESOL Quarterly, 37(2), 247-273. https://doi.org/10.2307/3588504

Glassman, M., Lin, T. J., & Ha, S. Y. (2022). Concepts, collaboration, and a company of actors: A Vygotskian model for concept development in the 21st century. *Oxford Review of Education 49*(2), 137–152. https://doi.org/10.1080/03054985.2022.2028611

Graham, C. R. (2019). Current research in blended learning. In M. G. Moore & W. C. Diehl (Eds.), *Handbook of distance education* (4th ed., pp. 173-188). Routledge. https://doi.org/10.4324/9781315296135-15

Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. Journal of Educational Computing Research, 17(4), 397-431. https://doi.org/10.2190/7MQV-X9UJ-C7Q3-NRAG

Halverson, L. R., Spring, K. J., Huyett, S., Henrie, C. R., & Graham, C. R. (2017). Blended learning research in higher education and k-12 settings. In J. M. Spector, B. B. Lockee, & M. D. Childress (Eds.), Learning, design, and technology: An international compendium of theory, research, practice, and policy (pp. 1-30). Springer International Publishing. https://doi.org/10.1007/978-3-319-17727-4_31-1

Heimlich, J. E., & Norland, E. (2002) Teaching style: Where are we now? New Directions for Adult and Continuing Education, 93 (Spring 2002), 17-25. http://onlinelibrary.wiley.com/doi/10.1002/ace.46/abstract

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency teaching and online learning. *EDUCAUSE Review*. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Hoven, D., & Palalas, A. (2016). Ecological constructivism as a new learning theory for MALL: An open system of beliefs, observations, and informed explanations. In A. Palalas & M. Ally (Eds.), *The international handbook of mobile-assisted language learning* (pp. 113-137). China Central Radio & TV University Press. https://www.academia.edu/27892480/The_International_Handbook_of_Mobile-Assisted_Language_Learning

Keller, G. (2008). *Higher education and the new society*. Johns Hopkins University Press.

Kemmis, S. (1997). Action research. In J. P. Keeves (Ed.), Educational research, methodology, and measurement: An international handbook (2nd ed., pp. 173-179). Elsevier Science Ltd.

Krathwohl, D. R. (2002). A revision of bloom's taxonomy: An overview. Theory into practice. https://doi.org/10.1207/s15430421tip4104_2

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). Taxonomy of educational objectives: The classification of educational goals. Handbook II: the affective domain. David McKay Company.

Lantolf, J. P. (2011). The sociocultural approach to second language acquisition. In D. Atkinson (Ed.), *Alternative approaches to second language acquisition* (pp. 24-47). Routledge. https://doi.org/10.4324/9780203830932-2

Lantolf, J. P. (2013). Sociocultural theory: A dialectical approach to L2 research. In S. M. Gass & A. Mackey (Eds.), *The Routledge handbook of second language acquisition* (pp. 57-72). Routledge. https://doi.org/10.4324/9781003270546

Lantolf, J. P., & Poehner, M. E. (2004). Dynamic assessment of L2 development: Bringing the past into the future. *Journal of Applied Linguistics, 1*(1), 49-72. https://doi.org/10.1558/japl.1.1.49.55872

Lantolf, J. P., & Poehner, M. E. (2011). Dynamic assessment in the classroom: Vygotskian praxis for second language development. Language Teaching Research, 15(1), 11-33. https://doi.org/10.1177/1362168810383328

Lantolf, J. P., Thorne, S. L., & Poehner, M. E. (2015). Sociocultural theory and second language development. In B. van Patten & J. Williams (Eds.), Theories in second language acquisition (pp. 207-226). Routledge. https://doi.org/10.4324/9780203628942

Laurillard, D. (2012). Teaching as a design science: Building pedagogical patterns for learning and technology. Routledge. https://doi.org/10.4324/9780203125083

McNiff, J. (2013). Action research: Principles and practice (3rd ed). Taylor and Francis. https://doi.org/10.4324/9780203112755

Miyashita, H. (2022). *Developing higher order thinking through asynchronous forums in blended learning design.* [Doctoral dissertation, Athabasca University]. Athabasca University Digital Archive. http://hdl.handle.net/10791/396

Miyashita, H., & Wark, N. (2024a). Action research to design a model for mediation in online discussion forums. *Thinking Skills and Creativity, 52*. https://doi.org/10.1016/j.tsc.2024.101489

Miyashita, H., & Wark, N. (2024b). Using online discussion forums in blended learning design to advance higher order thinking. *Asian Journal of Distance Education, 19*(1). https://asianjde.com/ojs/index.php/AsianJDE/article/view/738

Nishino, T., & Watanabe, M. (2008). Communication-oriented policies versus classroom realities in Japan. *TESOL Quarterly, 42*(1), 133-138. https://doi.org/10.1002/j.1545-7249.2008.tb00214.x

Oktay, Ö. S., & Yüzer, T. V. (2023). The analysis of interactive scenario design principles supporting critical and creative thinking in asynchronous learning environments. Interactive Learning Environments. https://doi.org/10.1080/10494820.2023.2195443

Owens, S. (2013). We teach how we've been taught: Expeditionary learning unshackling unsustainable education in U.S. public schools. Journal of Sustainable Education, 5. http://www.jsedimensions.org/wordpress/wp-content/uploads/2013/06/Stephanie-Owens-finalproof-May20131.pdf

Poehner, M. E. (2007). Beyond the test: L2 dynamic assessment and the transcendence of mediated learning. *Modern Language Journal, 91*(3), 323-340. https://doi.org/10.1111/j.1540-4781.2007.00583.x

Reigeluth, C. M., & Carr-Chellman, A. A. (2009). Instructional-design theories and models. Routledge. https://doi.org/10.4324/9780203872130

Richards, J. C., & Rodgers, T. S. (2001). Approaches and methods in language teaching. Cambridge University Press. https://doi.org/10.1017/cbo9780511667305

Rourke, L., & Anderson, T. (2004). Validity in quantitative content analysis. Educational Technology Research and Development, 52(1), pp. 5-18. https://www.jstor.org/stable/30220371

Sanders, K., & Lokey-Vega, A. (2020). K-12 Community of Inquiry: A case study of the applicability of the Community of Inquiry framework in the K-12 learning environment. Journal of Online Learning Research, 6(1), 35–56.

Vaughan, N. D., Cleveland-Innes, M., & Garrison, D. R. (2013). *Teaching in blended learning environments: Creating and sustaining communities of inquiry*. AU Press. https://doi.org/10.15215/aupress/9781927356470.01

Vaughan, N. D., Dell, D., Cleveland-Innes, M., & Garrison, D. R. (2023). *Principles of blended learning: Shared metacognition and communities of inquiry*. AU Press. https://doi.org/10.15215/aupress/9781771993920.01

World Economic Forum. (2023). The future of jobs report 2023. https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

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