Collaboration through Online Discussion Board: A Discourse Analysis of CALL in a Normal University in China

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Abstract
Ever since the COVID-19 pandemic, all students take courses online in Mainland China at the beginning of the semester. The discourse for communication online is important for a successful course. In this study, the online discussion board assignment of a college graduate course was analyzed for the discourse patterns based on Vygotsky's Cultural-historical theories that are more pragmatic than linguistics (Wertsch, 1990) and miss communication between students (Forman & McCormick, 1995). The course was taught and communicated in all-English. Participants are first-year graduate students in one Normal University in Northern Jiangsu Province in China. Data were generated based on a discourse analysis qualitative research and analyzed using the histogram and qualitative discourse pattern analysis. Findings for the histogram showed a late assignment submission, while more than half of students submitted during the final three days while having 11 days to finish. Patterns of responding were discussed in "questions with most responses" and "questions with no response." The open-ended questions allow respondents to utilize knowledge previously acquired as mediation for further discussions, while close-ended questions received a pattern of the contribution of degrading. Questions with no responses were mostly posted during the final two days. The discourse pattern of online discussion boards, thus manifested itself as a mediation tool for idea exchange not only online for peer evaluation but also self-evaluation.
Keywords: CALL, Cultural-historical Theory, EFL, Online Discussion Board, Vygotsky

Introduction

Learning Online becomes a necessity during the COVID-19 pandemic for most of the students everywhere in the world. According to the "United Nations Educational, Scientific and Cultural Organization (UNESCO)," about 1.2 billion students have been out of school due to school closures over 150 countries globally wide (UNESCO, 2020). It is a wake-up call for Computer-mediated Communication (CMC) through Information and Communication Technology (ICT) to be used for online courses in such a magnitude. Locally, teachers have been trying hard to generate their online learning material and procedures for student's learning needs. As all universities were closed in China for an extensive time during the COVID-19 pandemic, students have taken courses online as well through a variety of platforms and methods. This study investigated student's discourse through an online discussion board of a whole English graduate online course.

When students communicate for an online course, they do not communicate with a single platform, app, or method. For instance, the graduate online course was designed to be taken face-to-face but redesigned online a week before the semester began. The content of the course and class activities had to be justified in the online environment. For instance, ZOOM was used for real-time, audio-visual lectures and break-out room collaborative activities during normal class hours. After the class hours, students work on assignments announced in a learning management system (LMS) called the Yuketang (or Rain Classroom) developed by Tsinghua University in China. The class discussion board was utilized to share their ideas and findings and demonstrate their understanding of content knowledge.

Literature Review

As CALL stands for computer-assisted language learning, some scholars tend to use this term as using computers in EFL learning as a scoop described by Chapelle and other scholars at the establishment of the term. (Greenleaf, 2011; Jarvis & Achilleos, 2013) The Behaviorist's beliefs of early computer-assisted learning evolved gradually, and the meaning of CALL changed from time to time accordingly to the advancement of technologies among language learning of non-native speakers.

Discussion Board

The Discussion board used to be designed and utilized as an integrated part of online learning platform systems; however, because of the flipped classroom pedagogy becoming popular nowadays, it is an additional communication tool for face-to-face classes. The strategy of using an online discussion board becomes a significant tool in a course learning design. There are types of responding styles in previous studies, such as asynchronized discussion through CMC without a moderator. (Kadir, Maros, & Hamid, 2013) Learners use linguistic features such as repetitive writing, online-based acronyms, copying of letters when collaborating with other learners online. Jonassen & Remidez Jr (2005) explained types of discussion as threaded and constraint-based. The threaded type "shows the list of all the messages with headings" (p. 115), while constraint-based discussions "are prestructured forms of conversation systems," and "discussion leaders supply the values for the attributes." (p. 116)

This study utilized a discussion board as a means for communication; the mediational function of it is essential to the whole discussion sequences. However, there was a moderator, the teacher, and all discussion posts were in a traditional treaded type.

Dimensions of CALL

Computer Assisted Language Learning, CALL, was getting its popularity after Computer-Aided (Assisted) Instruction, CAI, in conjunction with the trend of educational pedagogy. CALL has been understood as the process of tools being utilized in the process of English teaching. (Donaldson & Haggstrom, 2006) CALL is also implicated as a pedagogy for effective language learning in the context of blending traditional face-to-face classroom with online nonlinear communication technologies (Bahari, 2019). It also allows students to learn better in vocabulary by using CALL instruction (Shokrpour, Mirshekari, Moslehi, & POPESCU, 2019).

CALL used to be discussed according to different aspects such as "technology, English-teaching paradigm, view of language, the principal use of computers, and principal objective." It is also classified into "Structural/behavioristic CALL, communicative CALL, and Integrative CALL," according to the stages (Yang, 2010, p. 909). In other words, CALL has been used and applied in different perspectives and become a common term for any type of computer and information and communication technology-related.

In this study, one type of online discussion board activity was investigated for students' online discourses through teacher's theme questions answering, question generating for others, and responding to others.

Methodology

The data generation is based on a discourse analysis qualitative research with Cultural-historical perspectives. It consists of online discussion board posts and interactions of synchronized cloud video conferencing for the student's best learning experience possible with exciting technologies. This study first clarified the contextual, theoretical framework based on Vygotsky's Cultural-historical theories and raised research questions within the context, and With the framework and research questions raised, data was generated from the context. Answers of students to the teacher's theme question, questions raised by the students to other students, and answers from students to other students were collected. Data were analyzed and reduced by "selecting, simplifying, abstracting, and transforming" (Miles & Huberman, 1994, p. 10) and generate a transcript to "freeze the discourse" (Forman & McCormick, 1995, p. 152). Data was sorted, coded, and indexed to show the pattern of the discourse. Finally, data interpreted and discussed based on was analyzed for the discourse patterns based on Vygotsky's Cultural-historical theories that are more pragmatic than linguistics (Wertsch, 1990) and miss communication between students (Forman & McCormick, 1995); therefore, research questions can be answered for this study.

In the Cultural-historical discourse analysis, Gee et al. (1992) asserted that there are some assumptions for the study of educational processes:

1. Human discourse is rule-governed and internally structured.

2. It is produced by speakers situated in a sociohistorical matrix, whose cultural, political, economic, social, and personal realities shape the discourse.
3. Discourse itself constitutes or embodies essential aspects of that sociohistorical matrix. (p. 228)

The research was conducted through four phases for detecting students' interactions by using an online discussion board. The first phase is to clarify the theoretical foundations and beliefs within the context and denote research questions. The second phase is to generate data from the education context with a naturalistic approach. It is also to maintain contextualization as essential to qualitative research (Forman & McCormick, 1995). The third phase is to analyze data generated from the context and reduce data by "selecting, simplifying, abstracting, and transforming" (Miles & Huberman, 1994, p. 10) and generate a transcript to "freeze the discourse" (Forman & McCormick, 1995, p. 152) The last phase is to interpretative data based on the theoretical framework. Research questions answered for this study (Forman & McCormick, 1995).

The online discussion board is a platform for idea exchange based on a given theme from the instructor—students' responses to the theme question according to the time sequences.

Procedure
The study was based on a graduate-level online course of "Curriculum and Instruction," a whole English course. Students not only studied the content knowledge of curriculum and instruction design but also acquired specified English in the education field related to their major. In this study, the researcher focused on the online discussion board in certain ways that manifest the discourse of learning in their language acquisitions using the online discussion board in the learning management system.

The design of this particular online discussion that this study investigated was in the AQ2A sequence. That was one theme question from the teacher to all students, one question from a student to other students, and two answering from a student to any other two students. Because of the time sequence of a student's responding time, the discussions will be like a solitaire; thus, we used it to detect the Cultural-historical events within the discussion discourse. The procedures were as follows in detail.
1. *Answering the Theme Question*
   Before the instructor assigned the discussion, students received a reading material as pre-knowledge for discussion. This knowledge in large was introduced in Chinese in other classes but in English the first time. The reading material was two electronic journal articles regarding "connectivism" and "constructionism."
2. *The question to Other Students*
   Students were asked to make a question for other classmates to answer.
3. *Two other students' Questions to be Answered*
   Students had to answer two other classmates' questions posted on the discussion board before their posting.

Participants

   51 Graduate students of the School of Education Science of a University in Northern Jiangsu Province. Those graduate students are from two majors: curriculum and instruction and elementary education. The course was "Curriculum and Instruction (Learning Design and Technology), and the following technology was employed for the benefit of students.

1. Online synchronized communication by using ZOOM.
2. Online asynchronized discussion by using Rain Course, as shown in Figure one.
3. Online Social Chatting by using Tencent QQ.
4. Online Media sharing Tencent V.QQ.

In this study, data were generated from the asynchronized discussion by using Rain Course.
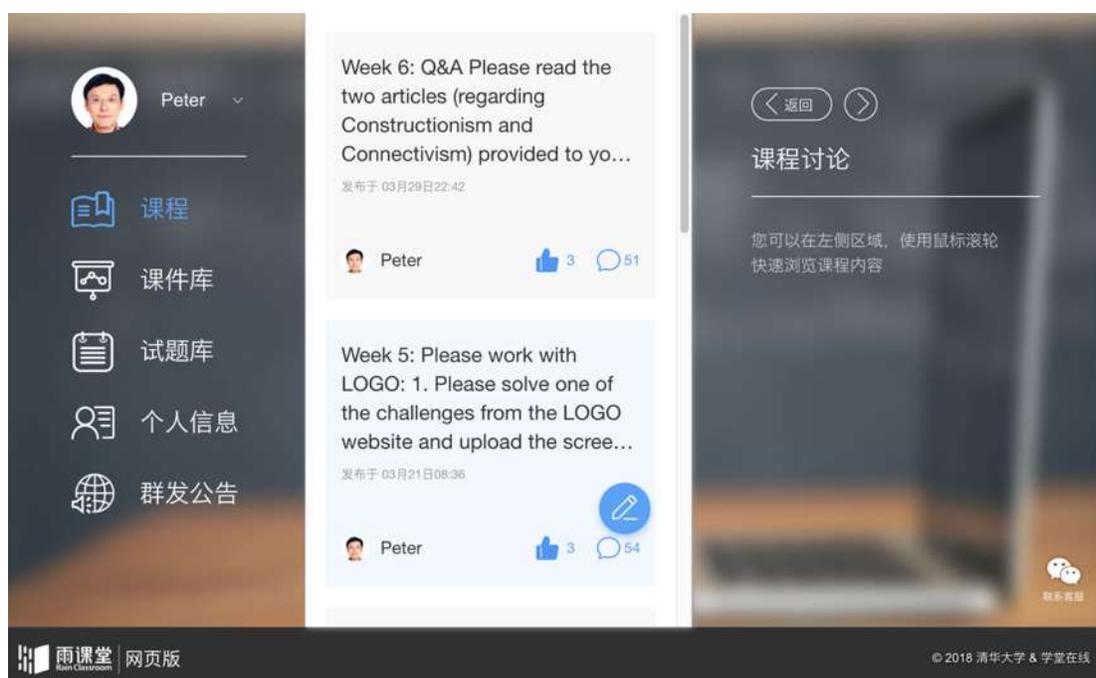

Figure 1 Interface of the discussion board of Rain Course

Results and Discussion

   This study generated data from the online discussion board and did discourse analysis based on Vygotsky's Cultural-historical theories. The discussion will be followed in two sections, "making connections of others" and "making meanings out of the discourse." The assigned discussion was posted on March 29, and students had time to finish this assignment from March 29 to April 9, 11 days in total. The assignment was stated as follows:

> Week 6: Q&A Please read the two articles (regarding Constructionism and Connectivism) provided to you. 1. Please provide one of your favorite quotes (one sentence) from the readings. 2. Ask ONE question regarding those two articles. 3. Answer TWO questions from other classmates. The assignment is due on 4/9. Please take your time. (discussion board T#1)

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First, students were required to read and quote their favorite sentences from those two articles. In this task, students were acquiring new knowledge against what they have learned from other classes. Another reason for this reading assignment was that "constructionism" and "connectivism" were not familiar terms if compared with classical education paradigms or theories, such as behaviorism, cognitivism, and constructivism. While those two were closely related to instructional design and technology, students need some background knowledge for further discussion in the process of this class.

Second, students had to generate one question for other classmates. After the readings, students were required to give out questions according to their readings. In generating questions, students' cognitive capacity was utilized for better presenting and enhancing "learners' meta-cognition to promote reading comprehension" (Khansir & Dashti, 2014, p. 39).

Last, students were asked and encouraged to answer two questions from others. Question-asking-answering has been one of the established strategies for students' self-evaluation. While self-questioning, we brought the idea of collaborative leering and interacting with the more knowledgeable other (MKO) from Vygotsky's Cultural-historical theories (Vygotsky, 1978). The evaluation process goes through three stages as self, peer, and teacher (Panahandeh & Asl, 2014, p. 1413). However, to investigate the discourse of learning on the discussion board, we utilized it as self-peer relation within an online course context.

Making Connections of Others
In Vygotsky's theories, the More Knowledge Other (MKO) is one of the most important components in the theory of the Zone of Proximal Development (ZPD). The discussion board was meant for production for students to make connections to the content knowledge as well as the use of English as a tool for communication on the platform. The frequency of responding among students was organized in Table one.

Table 1. *Frequency of responding among students*

time posted	responses	time posted	responses	time posted	responses
2020/3/30 12:24	7	2020/4/7 9:49	2	2020/4/9 10:13	2
2020/3/30 17:38	2	2020/4/7 12:53	2	2020/4/9 10:24	2
2020/3/30 22:37	0	2020/4/7 12:56	2	2020/4/9 15:33	1
2020/3/31 20:21	1	2020/4/7 14:04	2	2020/4/9 16:07	2
2020/4/3 12:43	5	2020/4/7 14:33	2	2020/4/9 16:37	5
2020/4/3 14:43	2	2020/4/7 15:45	2	2020/4/9 17:13	0
2020/4/3 17:20	2	2020/4/7 17:37	1	2020/4/9 17:17	0

Date	Count	Date	Count	Date	Count
2020/4/3 22:04	2	2020/4/7 18:43	5	2020/4/9 18:09	0
2020/4/3 22:11	2	2020/4/7 21:05	5	2020/4/9 18:12	1
2020/4/4 16:25	2	2020/4/7 21:48	2	2020/4/9 18:41	1
2020/4/4 16:31	2	2020/4/7 22:05	6	2020/4/10 23:12	0
2020/4/4 18:52	6	2020/4/8 9:00	2		
2020/4/5 11:33	2	2020/4/8 10:43	2		
2020/4/5 16:23	2	2020/4/8 11:09	5		
2020/4/5 16:26	2	2020/4/8 11:15	1		
2020/4/5 17:49	5	2020/4/8 13:46	1		
2020/4/6 11:49	5	2020/4/8 16:29	0		
2020/4/6 16:46	2	2020/4/8 19:31	1		
2020/4/6 17:57	1	2020/4/8 21:04	2		
2020/4/6 22:23	2	2020/4/8 22:18	0		

From Table one, responding to student's original posts was shown in chronological order. The frequency of responding was analyzed according to the posting dates. Students' responses were displayed in time sequence. Responding posts over five were highlighted in red while posts of one and zero were heightened in green and yellow.
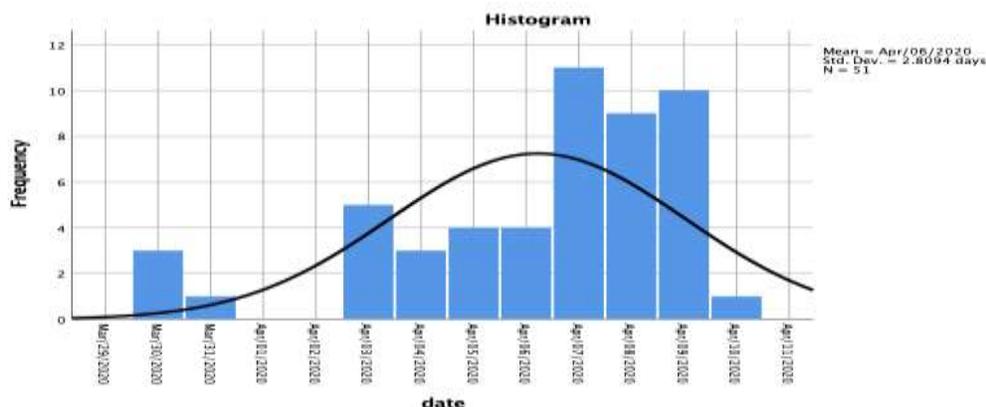

Figure 2 Histogram of postings distribution over time

The histogram's central tendency in Figure 2 shows the center is from April 7 to April 9. Most values in the dataset are close to those days with around ten posts each. The histogram is left skew, for most posts were done in the latter days. The histogram shows that most of the postings were posted during the last several days during the 11 days for students to complete their assignments. According to the cumulative percent, about 60% of the posts were done by the last three days from April 7 to April 9 and one overdue post on April 10. The frequency and cumulative percentages are shown in Table two below.

Table 2. *Frequency of postings according to dates*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30-MAR-20	3	5.9	5.9	5.9
	31-MAR-20	1	2.0	2.0	7.8
	03-APR-20	5	9.8	9.8	17.6
	04-APR-20	3	5.9	5.9	23.5
	05-APR-20	4	7.8	7.8	31.4
	06-APR-20	4	7.8	7.8	39.2
	07-APR-20	11	21.6	21.6	60.8
	08-APR-20	9	17.6	17.6	78.4
	09-APR-20	10	19.6	19.6	98.0
	10-APR-20	1	2.0	2.0	100.0
	Total	51	100.0	100.0	

Discourses in Questions with Most Responses

Within the context, discourse manifests its mediational nature for discussion from the past to the future. This study investigated the second level of students' posts who received more than five responses. Questions were asked were sorted in time sequence as follows:

1. What does Driscoll define learning? (discussion board ST#1)
2. What are the principles of connectionism, and what are their implications for you? (discussion board ST#5)
3. What are the principles of connectivism？ (discussion board ST#12)
4. How can we continue to stay current in a rapidly evolving information ecology? (discussion board ST#16)
5. What impressed you about the principles of connectivism, and why? (discussion board ST#17)
6. Gredler (2001) expresses behaviorism as being comprised of several theories that make three assumptions: what are the assumptions? (discussion board ST#28)
7. How can we better combine math learning and activities in math teaching? (discussion board ST#29)
8. According to Driscoll (2000), how can we explain "learning"? (discussion board ST#31)
9. What are the limitations of behaviorism, cognitivism, and constructivism? (discussion board ST#34)
10. Which do you think is more important, knowledge or ability? why? (discussion board ST#45)

While looking at those questions, the study found that factual questions were often asked with "what/which" type in student participants ST#1, 5, 12, 17, 28, 34, and 45. Even ST#8 used "how"

type of question, and it was asked for the definition of "learning." Definitions and principles were asked the most among those questions received most answers from other classmates. However, ST#17 and ST#45 asked "why" at the end for reasons of answering. Students ST#16 and ST#29 asked "how" regarding information ecology and teach models in math teaching.

For the pure factual type of questions, answers are based on the reading material with slightly additional information from postings before their answers. Participating student ST#1 asked for Driscoll's definition of learning. Answers are as follows:

> Driscoll defines learning as "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world" This definition encompasses many attributes related to behaviorism, cognitivism, and constructivism -- that is, learning is a state of lasting change (emotional, psychological, and physical (i.e., skill) that is the result of experience and interaction with content or others. (discussion board ST#24 to ST#1)

> A persisting change in human performance or performance potential must come about as a result of the learner's experience and interaction with the world. learning as a lasting changed state (emotional, mental, physiological (i.e., skills)) brought about as a result of experiences and interactions with the content or other people. (discussion board ST#23 to ST#1)

> Driscoll defines learning as "a persisting change in human performance or performance potential, which must come about as a result of the learner's experience and interaction with the world." learning as a lasting changed state (emotional, mental, physiological) brought about as a result of experiences and interactions with the content or other people. (discussion board ST#22 to ST#1)

> Continuous change in human behavior or behavioral potential must be a result of the interaction between the learners' experience and the world. (discussion board ST#15 to ST#1)

Learning as a lasting changed state (emotional, mental, physiological) brought about as a result of experiences and interactions with the content or other people. (discussion board ST#2 to ST#1)

As the study observed, the first posts to a question established a fully developed communication while the latter decreased their words for communication gradually. The content of the response is according to the original assigned text, while the additional secondary information was included selectively. The sentence, which mediates their ideas to the second level questions, became limited. A similar pattern of responses was found in others as well. Participating student ST#31 posted the following question: According to Driscoll (2000), how can we explain "learning"? (discussion board ST#31)

> a persisting change in human performance or performance potential...[which]must come about as a result of the learner's experience and interaction with the world (discussion board ST#44 to ST#31)

> "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world," according to Driscoll (2000). (discussion board ST#40 to ST#31)

> According to Driscoll, learning can be defined as" a persisting change in human performance or performance potential...[which]must come about as a result of the learner's experience and interaction with the world" (discussion board ST#37 to ST#31)

> Driscoll (2000) defines learning as "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world" (discussion board ST#32 to ST#31)

For the "how" type of questions, other classmates' answers were more opened with creativity in their discourses. For ST#16, the question was about ways to stay current with information ecology. Answers from other classmates used strategies of clear orders to the response.

> To develop in a rapidly developing contemporary society, we must first learn and master the necessary modern survival skills. Secondly, education is also very important for individuals' development, according to the individual situation as much as possible, to receive school education, job training, and so on. Thirdly, cultivate their own ability to adapt to social development, such as self-study ability, professional field skills, and try to be better than others. Finally, teamwork is also an important way to ensure that it is not eliminated by society, learning from each other in the team, helping each other, and improving the learning efficiency. (discussion board ST#18 to ST#16)

> In this quote from ST#18, the response was quite organized, with logic consisted of the whole response by using orders. Those ideas were not directly from the readying, but because of the question raised by ST#16, ST#18 generated the response accordingly. The mediational function of the level 2 self-questioning became crucial for further development of the English language use in a teaching professional ESP context. There were also answers short that may not bring very meaningful mediation.

> Establish a connectionist learning theory and apply it to practical education. (discussion board ST#14 to ST#16)

In this response, ST#14 did not depict how to make "stay current" feasible but just gave out a term for satisfying for homework grading purposes. To sum up, questions with open-ended style may bring some meaningful discussion through student's creativity, but there were still responses without mind.

Discourses in Questions Receive no Response.

While most students received answers from other classmates, few of them did not get any responses. Except for the one who posted the first level overdue, five out of six received no answer when they had their first level post on the last day on April 9. Questions asked of no response are as follows:

1. The paper mainly researches how to connect the constructivism to other useful theories in the applicable area like mathematics due to its characteristic of thinking, but how to enlarge its effects into the literary subject? (discussion board ST#3)
2. What do you think of connectivity and networking? (discussion board ST#37)
3. What assumptions did Gredler (2001) make about learning? (discussion board ST#40)
4. What do the three theories of behaviorism cognitivism and constructivism have in common? (discussion board ST#46)
5. How to combine learning and activity better in the process of mathematics teaching? (discussion board ST#47)
6. How can we better teach mathematic materials by constructionism theory? (discussion board ST#48)
7. How to apply educational concepts to practical teaching more effectively? (discussion board ST#51)

According to the responses, most of them were later ones; therefore, we can presume that those discussions threads would draw less attention from peers. Even the instructor began the discussion with vivid instructions of AQ2A, discourses between students were rather scanned through time sequences. Discussions through CMC without a moderator, as Kadir et al. depicted (2013), would bring some confusion, but the issues raised by students would be essential to the discussions to roll.

Conclusion

In conclusion, the online discussion board assignment of a college graduate course was analyzed for the discourse patterns based on Vygotsky's Cultural-historical theories that are more pragmatic than linguistics (Wertsch, 1990) and miss communication between students (Forman & McCormick, 1995). Data were generated based on a discourse analysis qualitative research and analyzed by using the histogram as well as qualitative discourse pattern analysis. Findings for the histogram showed a late assignment submission, while more than half of students submitted during the final three days while having 11 days to finish. Patterns of responding were discussed in "questions with most responses" and "questions with no response." The open-ended questions allow respondents to utilize knowledge previously acquired as mediation for further discussions, while close-ended questions received a pattern of the contribution of degrading. Questions with no responses were mostly posted during the final two days. The discourse pattern of online discussion board thus manifested itself a mediation tool for idea exchange not only online for peer evaluation but also self-evaluation.

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