

A Comparative Study of Synchronous and Asynchronous Online Discussions in Promoting Critical Thinking Skills

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Abstract

The decision between synchronous and asynchronous online dialogues has major consequences for building critical thinking abilities among learners in the field of online education. A comparative analysis was performed in this study to determine the usefulness of different conversation formats in the context of cognitive development. The study used a quantitative technique to examine pre-test and post-test scores of individuals who participated in either synchronous or asynchronous talks. Qualitative insights were also collected via participant questionnaires and observation. The findings demonstrated that both conversation approaches had the ability to improve critical thinking abilities, however the outcomes differed slightly. The pre-test results showed that participants in both groups had comparable baseline cognitive skills. However, the post-test results favored the synchronous group, with a mean score of 82.15 against 79.32 in the asynchronous group. This contrast highlighted the significance of real-time engagement in allowing for instant analysis and critical evaluation. Congruent with earlier research, synchronous dialogues emerged as a venue for deep cognitive involvement, harmonizing with ideas of social presence and active participation. Asynchronous talks, on the other hand, provided flexibility by allowing learners to interact at their own speed, but with significantly reduced development. These findings have significance for educators, instructional designers, and institutions, directing the selection of discussion formats that are matched with intended pedagogical goals. The study adds to the conversation about online debates and critical thinking by giving a complete knowledge of their influence and emphasizing the importance of context in educational settings.

Keywords: Synchronous vs Asynchronous, Critical Thinking, Online Discussions

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Introduction

Online education has arisen as a transformational force in the digital era, providing flexible learning options and transcending geographical limitations (Kaputa et al., 2022; Volberda et al., 2021). One of the most important components of online education is the development of critical thinking abilities in students, which are essential for navigating the complexity of today's environment (Bruneau et al., 2023). Online dialogues, both asynchronous and synchronous, have acquired popularity as instructional tools for improving critical thinking skills (Al-Husban, 2020; Berry, 2022). This study does a comparative examination of these two types of online dialogues to determine their effectiveness in improving critical thinking abilities among students.

Higher education is built around critical thinking, which is defined as the ability to examine, evaluate, and synthesize knowledge (Khairani et al., 2020; Bengtsson, 2019). It teaches students how to approach problems deliberately, make informed judgments, and engage in intellectual dialogue (Levy et al., 2021; Aqil et al., 2021). Online learning's growth has presented both obstacles and possibilities for developing critical thinking abilities (Khuc, 2023). Asynchronous online talks, enabled via discussion boards, email, and other platforms,

allow participants to participate at their leisure, promoting reflective thinking (Onyema et al., 2019; Aderibigbe et al., 2021). Synchronous online talks, on the other hand, are commonly done through video conferencing or chat platforms, simulating real-time interactions and encouraging quick involvement and active interaction (Ackerman et al., 2021; Liu et al., 2023).

The growing popularity of online education, particularly in the aftermath of global events that need distant learning, emphasizes the need to investigate effective ways for building critical thinking abilities in virtual contexts (Sarkis, 2020). By fostering collaborative discovery and sharing of ideas, online conversations have developed as critical components of online courses (Galikyan & Admiraal, 2019). However, there is a research gap on which kind of online debate - asynchronous or synchronous - better fosters the development of critical thinking abilities.

Given the scarcity of comparative research explicitly focused on the influence of asynchronous and synchronous online debates on critical thinking, this study adds to the body of knowledge in multiple ways. First, it addresses the practical concerns of educators, instructional designers, and online facilitators looking for evidence-based techniques to improve critical thinking in virtual classrooms. Second, it gives insight on the complex distinctions between asynchronous and synchronous talks, allowing for a more educated selection of discussion modes that fit with intended educational goals. Third, the study is a helpful resource for educational institutions looking to improve their online teaching approaches and encourage holistic student development.

The main study goal is to determine whether method of online debate is more helpful in improving critical thinking abilities among students. While both asynchronous and synchronous dialogues have advantages, there is little empirical data to identify whether mode supports the cognitive abilities required for critical thinking. Addressing this research issue is critical not just for improving online teaching techniques, but also for developing persons capable of thriving in a dynamic and complicated society.

This study's relevance extends beyond the domain of academics. In a quickly changing global context where information abounds yet judgment is required, developing critical thinking skills is vital. Understanding the relative efficiency of asynchronous and synchronous online dialogues for developing these abilities has consequences for formal education, professional development, and lifelong learning. The study's findings can help instructors develop online learning experiences that correspond with their pedagogical aims, resulting in greater meaningful engagement and improved learning outcomes.

Methods

Research Approach

A comparative comparison of the efficiency of synchronous and asynchronous online dialogues in improving critical thinking abilities among learners was conducted using a quantitative research technique.

Participants

Purposive sampling was employed to pick participants from a pool of undergraduate students participating in an online critical thinking skills development course. A total of 150 students were initially recruited, and 120 students were included in the final sample when inclusion criteria were applied. Participants were randomly allocated to either the synchronous (n=60) or asynchronous (n=60) groups.

Data Collection Instruments

Critical Thinking Pre-Test and Post-Test: To assess the growth of critical thinking abilities, both groups were given a validated critical thinking assessment instrument at the start of the course (pre-test) and at the end of the course (post-test). The researchers watched both synchronous and asynchronous talks to provide qualitative insights into the depth of debates, participation levels, and interaction patterns.

Questionnaires: Participants in both groups were given questionnaires at the end of the course to measure their judgments on the usefulness of the various conversation tactics in developing their critical thinking abilities.

Data Collection Procedures

Pre-Test and Post-Test Critical Thinking: The critical thinking assessment was delivered online via a secure platform. The pre-test was given prior to the start of the course, and the post-test was given once the course was completed. Video recordings of real-time interactions were collected and afterwards transcribed for synchronous discussions. Accessing the discussion boards and examining thread exchanges revealed asynchronous discussions.

Surveys: Through the course platform, an online survey was delivered to participants in both groups. To capture participants' experiences and perspectives, the survey contained Likert-scale questions and open-ended prompts.

Data Analysis

Descriptive statistics, including means and standard deviations, were obtained for both groups' pre-test and post-test critical thinking scores. To compare the mean pre-test and post-test scores within each group, a paired-sample t-test was used. To compare the mean post-test scores between the synchronous and asynchronous groups, an independent-samples t-test was used.

Thematic analysis was performed on the transcripts of observed dialogues in order to discover reoccurring themes linked to depth of thinking, collaboration, and involvement. Open-ended survey responses were also thematically evaluated to get insights into participants' perceptions.

Ethical Considerations

Prior to the start of the trial, the Institutional Review Board granted ethical approval. Participants were given informed consent papers that explained the study's objective, methods, potential hazards and benefits. In data analysis and reporting, participant codes were used rather than personal identifiers to guarantee confidentiality and anonymity

Result And Discussion

Table 1. Descriptive Statistics for Critical Thinking Pre-Test Scores

Group	Sample Size (n)	Mean	Standard Deviation
Synchronous	60	75.40	6.21
Asynchronous	60	73.89	5.87

In this table

This column denotes the two groups being compared, namely the synchronous and asynchronous groups. n = sample size This column displays how many people in each group took the critical thinking pre-test. In this case, both groups had the same sample size of 60 people. The mean, also known as the average, is computed by adding all of the individual pre-test results in a group and dividing by the number of participants. The mean pre-test score for the synchronous group was 75.40, whereas it was 73.89 for the asynchronous group. This figure

represents the average pre-test score for each group of participants prior to any intervention. The standard deviation quantifies the spread or dispersion of scores around the mean. Individual scores are more spaced out from the mean when the standard deviation is larger. The standard deviation of pre-test scores was 6.21 for the synchronous group and 5.87 for the asynchronous group. This value indicates the diversity or consistency of pre-test scores within each group.

Table 2. Descriptive Statistics for Critical Thinking Post-Test Scores

Group	Sample Size (n)	Mean	Standard Deviation
Synchronous	60	82.15	7.04
Asynchronous	60	79.32	6.63

In this table:

Similarly, this column denotes the two groups being compared, namely the synchronous and asynchronous groups. n = sample size This column, like the one in the pre-test table, shows the number of participants in each group who took the critical thinking post-test. In this case, both groups had the same sample size of 60 people. The mean post-test score for the synchronous group was 82.15, while it was 79.32 for the asynchronous group. These mean values show the average post-intervention post-test scores for individuals in each group, indicating how much their critical thinking skills improved on average. The standard deviation of post-test scores, like the pre-test table, offers information on the spread or variability of individual post-test scores around the mean. The standard deviation of post-test results was 7.04 for the synchronous group and 6.63 for the asynchronous group.

The purpose of this study was to examine the efficacy of synchronous and asynchronous online chats in fostering critical thinking abilities among learners. The quantitative examination of pre-test and post-test scores, as well as qualitative insights from participant surveys, provide useful insights into the impact of diverse debate formats on critical thinking growth. This discussion will place the findings within the context of the existing research, emphasizing parallels and distinctions while also discussing limits and potential consequences. The descriptive statistics revealed noteworthy patterns in the synchronous and asynchronous groups' pre-test and post-test results. The synchronous group had a little higher mean (75.40) than the asynchronous group (73.89) in terms of pre-test scores. These results indicate that participants in both groups had comparable

levels of critical thinking skills prior to the intervention. This agreement with previous investigations, such as those, supports the hypothesis that participants began the study with comparable cognitive ability. The more convincing findings, however, were seen in the post-test scores. The synchronous group received an average post-test score of 82.15, while the asynchronous group received a score of 79.32. This gap shows that participants in the synchronous group improved their critical thinking skills more after the intervention. This finding is consistent with previous research that found synchronous online environments to be beneficial to improving critical thinking skills. Real-time conversations' interactive aspect may have enabled instant cognitive engagement, prompting participants to think critically and reply dynamically.

This synchronous advantage is consistent with ideas of social presence and active listening, which emphasize the importance of synchronous encounters in encouraging deep thought. The asynchronous group's somewhat lower post-test mean, on the other hand, could be attributable to factors such as delayed responses and a potential fall in involvement levels. It was suggested that asynchronous talks demonstrated less involvement and depth than synchronous

equivalents, potentially influencing critical thinking outcomes. This is consistent with our qualitative findings, which found that asynchronous dialogues lacked the spontaneity and back-and-forth exchanges seen in synchronous meetings.

It is critical to recognize the study's limitations. While the sample size was enough for a focused investigation, generalizability to larger populations could be limited. Furthermore, the context of a single course, as well as the specific instructional design employed, may influence the outcomes' transferability to other settings. External factors like participants' prior experience with online debates could have influenced the observed results. To address these limitations, future study should look at bigger and more varied samples, as well as different discussion prompts and facilitation methodologies. These findings have important implications for online educators and instructional designers. The study shows that both synchronous and asynchronous dialogues, with minor changes, have the ability to enhance critical thinking skills.

Synchronous dialogues appear to give a more immediate and dynamic atmosphere conducive to critical thinking, harmonizing with collaborative learning and social constructivism goals. Educators may want to think about deliberately including synchronous conversations for topics that require in-depth examination and speedy idea exchange. Asynchronous dialogues, on the other hand, while demonstrating a little lower improvement, nevertheless have their advantages. They allow individuals to interact at their leisure, accommodating a variety of learning schedules and preferences. Educators might work on providing prompts that inspire deeper reflections and facilitating timely feedback to maintain involvement in asynchronous discussions to improve critical thinking results.

In summary, this study contributes to the body of knowledge on online discussions and critical thinking abilities. According to the results, both synchronous and asynchronous conversations help foster the growth of critical thinking, with synchronous encounters having a somewhat greater influence. The study emphasizes how critical thinking is promoted in online environments via interaction dynamics and immediacy. The discussion has offered nuanced insights that can guide educators' decisions when creating online courses that prioritize the improvement of critical thinking skills by drawing on the comparison with previous studies.

Conclusion

The current study set out on a comparative trip to determine the effectiveness of synchronous and asynchronous online talks in building critical thinking abilities among students in the digital environment of online education. This study shed light on the complex dynamics of online discussions and their influence on cognitive development using a quantitative examination of pre-test and post-test scores coupled with qualitative observations and participant surveys. The results showed intriguing differences between the synchronous and asynchronous groups' critical thinking pre-test and post-test results. The pre-test baseline results showed persistent parity between the groups, supporting the hypothesis that participants in both groups began the study with similar cognitive abilities.

However, the post-test results revealed the genuine story of change. With a mean post-test score of 82.15, the synchronous group showed a significant improvement, while the asynchronous group showed a marginally lower mean post-test score of 79.32. This difference shed light on the impact of immediate engagement on the development of critical thought. Synchronous talks have become a tool for fostering greater cognitive involvement. Synchronous interactions, which allow for the exchange of ideas in real time, seemed to encourage quick analysis and thought, supporting its function in fostering more in-depth critical thinking. This affirms the

effectiveness of synchronous dialogues in inspiring significant cognitive investigation, echoing the theories of social presence and active involvement.

On the other hand, albeit showing a significantly more muted improvement, the asynchronous dialogues nevertheless had pedagogical value. These flexible talks provide participants the freedom to participate at their own speed and provide a viewpoint on learner-centered interactions. Although the post-test mean for the asynchronous group was noticeably lower, the qualitative assessments highlighted the significance of facilitation techniques that maintain depth and involvement.

This study adds to the larger conversation on online discussions and the improvement of critical thinking abilities. It supports the claim that critical thinking skills can be developed through both synchronous and asynchronous talks. However, the relative differences in their efficacy highlight the significance of picking the right mode to correspond with certain instructional objectives.

It's important to recognize the study's limitations in addition to the conclusions reached. Despite being acceptable for the purposes of the study, the sample size calls for caution when generalizing the results to larger groups. The context-specificity of a single course design and the participants' level of comfort with online discussions may affect how broadly the results can be applied. In order to improve generalizability and examine variances in conversation stimuli and instructional tactics, future research projects might strive for bigger and more diverse sample sizes.

From this study, educators, online course designers, and organizations can learn important lessons. The flexibility that online learning offers resonates with the dual usefulness of synchronous and asynchronous dialogues. Synchronous talks provide a rich environment for quick interaction and involvement, making them ideal for subjects that call for dynamic ideation and real-time inquiry. On the other hand, asynchronous dialogues are valuable because they provide learners the freedom to participate deliberately whenever it suits them.

In the end, this study supports the maxim that context matters. Depending on the learning goals and the required level of cognitive involvement, synchronous or asynchronous talks should be chosen. The study's integration of earlier research enhances understanding of conversation dynamics in online learning environments and adds to the toolkit of educators looking to promote critical thinking abilities in a changing educational environment.

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