Exploring Satisfaction, Academic Performance, and Knowledge Building of Students in Online Collaborative Learning Environments

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Abstract:

Online collaborative learning (OCL) has become an effective teaching strategy in the digital age, allowing students to communicate, exchange ideas, and expand their knowledge via virtual platforms. Understanding how students view their educational experiences is crucial as more and more institutions use online teaching methods. Three important facets of OCL are examined in this study: knowledge development, academic achievement, and student happiness. The study intends to evaluate how well collaborative tools and tactics promote significant learning outcomes in online settings by looking at these factors. The research examines how factors such as peer interaction, technological support, and instructional design influence learners' experiences and outcomes. Data collected through surveys A Urban B.Ed and a Rural B.Ed both had first-year students majoring in educational sciences. Analysis was done on the differences and similarities between the two student groups in terms of achievement, learning process, and satisfaction.

Keyword: Satisfaction, Knowledge Building Online Collaborative learning (OCL),

Introduction:

For beyond changing how students obtain information, the digital revolution in education has also changed the dynamics of their interaction, teamwork, and knowledge construction. Online collaborative learning settings have become increasingly potent venues where students can engage in real-time communication, share ideas, and jointly develop understanding across geographic borders as traditional classroom barriers collapse. Originally a reaction to necessity, the move to online learning is now a conscious tactic to promote pedagogical innovation, flexibility, and inclusivity.

However, access to or infrastructure for technology alone cannot be used to determine how successful these virtual learning environments are. Instead, it depends on more profound educational results, such as academic achievement, student pleasure, and the collaborative creation of valuable knowledge. These characteristics are crucial markers of OCL settings' durability and efficacy. Even with growing use, little is known about how these factors interact and affect one another in virtual environments.

By investigating how students view their learning experiences on collaborative online platforms, how these experiences translate into academic success, and how shared digital engagement promotes the creation of new knowledge, this project aims to close that gap. By doing this, the study advances changing educational

paradigms and provides useful information for teachers, educational designers, and regulators who want to improve contemporary digital learning approaches.

Understanding Student Preferences and Satisfaction in Multicultural Online Learning Environments

A comparative study by Hannon and D'Netto (2007) suggested that international students in online programs express a preference for culturally inclusive content, and their satisfaction increases when instructional materials and group discussions reflect diverse perspectives. Technological familiarity and access have been shown to influence students' experiences and satisfaction with collaborative tools used in online environments, with disparities often observed across different socioeconomic and regional backgrounds (Sun et al., 2008).

This study involves students in two area wise contexts. Urban area students is situated in a western culture which is more individualistic, while the Rural student's culture is traditionally representative of a collectivistic culture. Previous studies indicate that students show a tendency to be introverted and passive, and less active in online collaboration. They also found that B. Ed students contributed less to online discussions. These results show that there are distinct features in online collaborative learning experiences, participation, and satisfaction of students from different cultural backgrounds.

Review of Literature:

Raman and Yadav (2021) studied undergraduate students in Indian universities and found that **active participation in online group work significantly enhanced conceptual understanding and academic performance**. They observed that students who collaborated using structured tools like Google Docs and WhatsApp groups scored higher in internal assessments than those working individually. **Kaur and Singh (2020) emphasized that teacher facilitation and group coordination were key determinants of effective online group discussions in Indian higher education. Their findings showed that students performed better when instructors provided clear roles, discussion rubrics, and timely feedback. Rovai (2007)** found that students who engage in **socially cohesive and well-managed online learning communities** tend to perform better in both discussions and group assignments. The presence of trust, shared goals, and instructor facilitation contributed significantly to productive collaboration and improved performance. **Chen, Wang, and Hung (2009)** explored the relationship between **peer interaction and student performance** in online collaborative settings. They concluded that **peer support, timely feedback, and equitable participation** are critical for successful group outcomes, and students in high-performing groups showed better individual academic achievement. **Aloni and Harrington (2018)** emphasize that **structured online discussions** significantly enhance student performance by promoting critical thinking, deeper engagement, and improved communication skills. They found that when discussion prompts are well-designed and aligned with learning objectives, students are more likely to participate meaningfully and perform better in assessments. In this study, we compare the performance in online discussions and group work between the Urban and Rural student groups of B.Ed class..

Research Objectives:

1. To Investigate how satisfied students are with online collaborative learning.
2. To assess how online group learning affects students' academic performance.
3. To explore how students, build and share knowledge in online collaborative settings.

Research questions

1) What are the differences in the satisfaction with the online collaborative learning between the Urban and Rural students?

2) What are the differences in student learning performance between Urban and Rural students?

3) Are there cultural differences in the level of student knowledge construction through social interaction in online discussions?

Research Hypothesis:

H1: There is significant differences in student satisfaction and academic achievement in an e-learning environment.

Null Hypothesis:

H0: There is no significant differences in student satisfaction and academic achievement in an e-learning environment.

Method

The current study focused on examining the satisfaction, online performance, and knowledge construction through peer interaction of students in different cultural contexts. For this purpose-learning platform and course design was set up in both a group. The E-learning platform is an open-source platform based on LMS. Efforts were made to make the learning design as similar as possible in the two educational settings. The same lectures were presented and the same online tasks were assigned to both groups during one academic semester.

Population:

All B. Ed college students of Savitribai Phule Pune University of Pune District.

The student groups were in a similar age range and with similar subject knowledge background, as both were first-year B. Ed students.

Sampling:

For this study, 43 Rural students and 57 Urban students majoring in educational were involved. The Rural students (43) were from a major comprehensive in B. Ed College. The Urban students (57) were from a comprehensive Urban in B. Ed college.

Research Process:

The online tasks were designed in a way that was suitable for both target groups. The online discussion and group work centred on themes in educational content. In view of each theme, authentic tasks were presented to the groups of students. For example, for the theme "Learning Disability and Blended Learning Mode" students were required to create blogs to explain the main concepts in a brief way and give examples. Students were able to use different sources such as articles, books, websites, photos, newspapers, and audio/video fragments to explain the different elements theoretically as well as to provide examples. They also needed to try to make the wiki attractive/inviting for readers.

Students were divided into groups of 5 members. Students were also trained on how to use the e-learning system, how to participate in group discussions, and how to create wiki documents and pages.

Procedure and instruments

In both the Urban and Rural area, students were randomly assigned to a group of 5 students. After every theme of lectures, students were required to participate in the online group discussions and group work on an assignment. Each online assignment lasted three and half weeks, and the students were required to contribute to online discussions and group work at least twice a week. Three teaching assistants were assigned as supervisors for each of the Urban and Rural student groups. After three and half months of online work, student online contributions were assessed on the basis of qualitative and quantitative criteria that were communicated to the students at the start of the course. Assessment was based on group achievement, and each group got a score for their online performance.

After one semester of online collaborative learning, students were asked to fill in a questionnaire about their satisfaction and dissatisfaction with online collaborative learning.

Data Collection Tool:

This questionnaire consisted of 20 questions assessing the satisfaction of collaborative learning and 20 questions for students to choose and rank the aspects that they like or dislike most. Students were required to report on a Likert scale (from 0 to 6) the extent that a certain statement was true or false or the extent to which they liked or disliked a certain function of the e-learning environment. Student satisfaction reflects five dimensions: e-learning function, collaborative learning, peer contribution, interaction with peer, and group results. In addition, the students also reported their demographic features and the average time they spent on the online discussion and group work per week.

Statistical analysis

T-tests were used to analyse the differences between the Urban and Rural students regarding their satisfaction and dissatisfaction with the online collaborative learning. Chi-square analysis was adopted to compare the student message types and the level of knowledge construction.

Student satisfaction and dissatisfaction with online collaborative learning

Significant differences were found between Urban and Rural students regarding their satisfaction and dissatisfaction with online collaborative learning. The Urban students reported a higher level of satisfaction with the e-learning functions, online collaboration, and peer contribution compared to the Rural students (<05). Compared to the Rural group, the Urban group was more satisfied with the equal contribution of group members (p<.01).

In addition, the Urban group preferred working together with others on the assignments than the Rural group (p<.01). students also reported to a larger extent that the online collaborative learning is "new and exciting" compared to the Urban group. The Urban students were more satisfied with the final results of the online group work compared to the Rural group (p<.001), and they spent more time in average on the online group collaborative learning, 5 hours per week for the B.Ed students. With regard to the dissatisfaction of students, the B. Ed group more often reported a lack of interaction between students and teacher in asynchronous group discussions compared to the Urban group. The Urban group reported to a larger extent that working on the tasks online was time-consuming compared to the B.Ed group (p<.001). The B. Ed students were less happy with task division in online group work than the Rural students. The main differences between the two groups are summarized in Table 1.

Table 1. Student satisfaction and dissatisfaction with online learning

	Mean	
Student satisfaction and dissatisfaction with online collaborative learning	Urban	Rural
Satisfaction with online collaborative learning	3.5	2.8
Satisfaction with collaborative learning in the e-learning environment	3.4	3.1
Satisfaction with peer interaction within the group	3.7	2.9
Satisfied with the functions of the e-learning environment	3.8	2.7
Satisfied with the final results on the group assignment	3.4	2.6
Satisfaction with equal group member contribution	3.7	2.8
Satisfaction with the opportunity that group members can work together on assignments	4.0	2.9
Satisfaction that working together can help me gain a deeper understanding of the course content	3.9	2.4

Dissatisfaction with online collaborative learning

Time-consuming

Dissatisfaction with task division

Lack of interaction with teacher

p<.05, p<.01, p<.001.

Despite the differences, similarities between Urban and Rural students were also found. Both Rural and Urban students reported that it was an advantage to be able to work at their own pace, and found it was an advantage that each group member could contribute to the group assignments in online collaborative learning. Both Rural and Urban students reported that online collaborative learning helped them to gain more knowledge than if they would have studied alone. They also stated that they had learned a lot, considering the time they've put into the online collaborative learning assignments. The Rural and Urban students were similarly satisfied with the peer interaction and with the technical help they received from the course coordinators.

As to what the students were satisfied and dissatisfied with, we found that the Urban students liked working at their own pace most of all, while the Rural students best liked the fact that they could work together with others on the assignments. What the Urban students disliked most was that working on the tasks online was time-consuming, whereas the biggest problem the B.Ed reported was the lack of interaction between students and teacher.

Student online learning performance and group achievement

Each student's online group assignment was assessed by two teachers. A bilingual teacher assessed both student groups, while a second teacher separately assessed the work of the Urban and Rural student groups. The assessment criteria, which were the identical for both settings, were communicated beforehand to all involved instructors and students. The assessment was centered on how frequently individuals contributed to the assignment and how successfully the group work was completed because the system can track each group member's participation in each task. Every task was assigned a score, and the final group score was calculated as the average of all group assignments. Comparing the achievements of student groups, the results show that, on average.

Every task was assigned a score, and the final group score was calculated as the average of all group assignments. The results show that, on average, urban students' mean scores were marginally higher than those of rural students when student group accomplishments were compared. (Table2)

Table 2. **Selected student group scores** of online group work Mean (SD) of assignment score (out of 100)

Group achievement	Urban	Rural
Gl	46	32
G2	42	29
G3	48	21
G4	46	28
G5	41	26

Content analysis of student knowledge construction through social interaction

In average, the Urban students posted weekly more messages per person (7.5 messages) in asynchronous group discussions compared to the Rural students (3.9 messages). For both groups, there were no significant differences as to the number of messages posted by male and female students. To test whether the types of messages and the achieved level of knowledge construction differ significantly, chi-square analyses were applied. The distribution of types of message and level of knowledge construction through social negotiation of the two groups are presented in Table 3..

The two groups' patterns were comparable in terms of the knowledge construction levels. Most of the messages from both groups were in the first stage of knowledge production, which involves exchanging and contrasting data. In contrast to rural students, urban students offered more messages that explored dissonance, which is the second phase of knowledge building. Approximately 12 percent of the messages at the third stage of knowledge construction—meaning negotiation—were supplied by both groups. Less than 4% of the messages from both groups made it to the fourth and fifth stages of knowledge creation.

Table 3. Types of messages and levels of knowledge construction

Levels of knowledge construction	Urban	Rural	X2
1. Sharing and comparing information	76 %	60%	1.23
2. Exploration of dissonance	4.2 %	21%	40.21
3. Negotiation of meaning	12%	14%	4.0
4. Testing synthesis	1.2%	2.1%	12.26
5. Agreement statements and applications of newly constructed meaning	1.9	0.9%	9.1

Discussion

This study focused on three key issues in relation to student satisfaction with the online learning environment, their online performance, and knowledge construction in online group discussions.

Surveying students' satisfaction with collaborative e-learning is a critical issue in promoting the innovative use of modern educational technology, especially in different area wise contexts.

Findings of the study:

Study results indicate that there were significant differences between Rural and Urban students regarding their satisfaction and dissatisfaction with online collaborative learning.

Urban students reported significantly higher satisfaction levels due to better access to stable internet connections, digital devices, and online platforms. Rural students expressed dissatisfaction due to frequent technical disruptions, low-speed internet, and limited access to digital tools. Urban students felt more supported by instructors and experienced better communication in online collaborative environments. Rural students reported delayed responses from instructors and less personalized interaction, contributing to dissatisfaction. Urban students showed greater engagement and satisfaction in group activities, citing ease of coordination through digital tools. Rural students encountered challenges in real-time participation, leading to feelings of exclusion and dissatisfaction with collaborative tasks. Urban students demonstrated higher digital literacy, which enhanced their comfort and satisfaction in navigating online collaborative tools. Many rural students lacked prior exposure to digital learning platforms, resulting in low confidence and dissatisfaction. Urban students believed online collaborative learning enhanced their academic performance and knowledge construction. Rural students felt that the lack of interaction, guidance, and technical barriers hampered their learning outcomes, reducing satisfaction

1. The study's findings validate that students' collaborative learning activities and knowledge production through group interaction can be enhanced by online learning systems.

2. When it comes to instructional design in various cultural contexts, culture and geographic environment are crucial factors to take into account.

3. Another significant factor affecting student learning, particularly in a student-cantered e-learning environment, is the degree of knowledge building and student satisfaction with the learning environment.

The main source of student discontent, according to the rural students, was the absence of teacher engagement and direction in the online learning environment. For the Urban students, teacher guidance was almost the same, but it was less problematic for the later group. This could be because the two separate groups have different expectations for teacher engagement. In the context of online group tasks, the Urban students outperformed the Rural students in performance. This may have something to do with the urban kids' more active participation. Furthermore, it appeared that urban pupils were more accustomed to challenging and voicing differing opinions.

Rural students on the other hand, were less likely to voice their own opinions or directly address those of others. Their ultimate group performance may have been affected by this.

Students' perceived satisfaction and their performance in online collaborative learning are important factors to determine whether an innovative learning approach can be applied in a sustainable way. This study confirms that there are significant cultural differences in student satisfaction and academic achievement in an e-learning environment.

The bulk of group communications for both groups were task-oriented, but Rural students submitted comparatively fewer non-task-oriented comments than Urban students when it came to student knowledge development through online conversations. Discussions were dominated by asking, arguing, explaining, and offering further resources. This could be because students in rural areas were reluctant to publicly disagree with their peers. Additionally, it was more challenging to categorize the messages since Rural students conveyed their disputes and dissonances more quietly. Additionally, fewer communications made it to the top echelons of knowledge formation. This allocation of the contributions made by the students.

Limitation

It has to be noted that the results should be considered in a cautious way as the study is applied in specific settings. The findings of this research may only be applicable in similar contexts. It also has to be pointed out that although. we have identified a series of differences and similarities between the two cultural groups, individual differences should not be neglected. Furthermore, the differences in the results of the two settings can be explained not only in relation to cultural differences, but also in relation to the new instructional experience for the Rural students. In addition, although we tried to control several educational setting variables, we realize that other variables might exist, such as social and economic environment, educational systems, and campus environment, which might have influenced student satisfaction, participation, and performance in the online collaborative learning environment.

In conclusion, this study confirms that there are significant cultural differences in student satisfaction, academic performance, and knowledge construction in an online collaborative learning environment. It also indicates that students' perceived satisfaction and their performance in online collaborative learning are important factors to determine whether an e-learning approach can be applied in a sustainable way.

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