

Investigating the Role of Online Communities in Promoting Collaborative Learning and Peer Interaction

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Abstract

The objective of this research is to investigate the correlation between the level of contentment that students experience in their social interactions with peers and their personal evaluations of academic achievements. Additionally, this study aims to analyze the influence of students' involvement in virtual communities on the effectiveness of their collaborative assignments. The data were collected through surveys administered to a subset of the population that was deemed statistically significant. The statistical analysis involved the utilization of both descriptive and inferential methods. The results indicate a positive association between engagement in virtual communities and effective collaboration. A noteworthy correlation was observed between the perceived level of learning among students and their satisfaction with the degree of participation exhibited by their peers during classroom discussions. The findings of this study enhance the existing knowledge by providing distinct empirical evidence specific to the context of Saudi Arabia. The significance of peer relationships is emphasized, and the promotion of collaborative learning through participation in online communities is underscored. The study's findings offer insights for individuals involved in promoting online community-based peer learning and engagement, including educators, politicians, and academics. Further research could be carried out in the future to investigate the mechanisms that support collaborative learning and peer interaction.

Keywords: *Online Communities, Collaborative Learning, Peer Interaction, Engagement*

Introduction

Over the past few years, virtual communities have expanded into thriving platforms for communication, collaboration, and knowledge sharing. Online communities enable individuals with shared interests, goals, or experiences to engage in communication, collaboration, and information exchange in manners that were previously unattainable. The proliferation of online communities has extended to various domains, including the realm of education, where they have the potential to significantly transform the pedagogical approach to student learning. This study centers on Saudi Arabia, a country that is experiencing a swift expansion of its digital infrastructure and educational initiatives. The objective of this research is to investigate the potential of online communities in promoting collaborative learning and peer engagement.

The significance of this study lies in the growing recognition of the importance of collaborative learning and interpersonal engagement within educational settings. In conventional educational settings, pupils may encounter limited opportunities to engage in classroom discourse, express their individual perspectives, or collaborate with peers in team-based activities. According to research conducted by Johnson and Johnson (2014), collaborative learning has been found to enhance comprehension, critical thinking, and information retention. Moreover, according to Vygotsky's (1978) theoretical framework, the capacity of learners to effectively participate in and acquire knowledge from their peers is instrumental in enhancing their overall academic performance.

The Ministry of Education in Saudi Arabia has placed increasing emphasis on promoting innovative and student-centered learning methodologies, as education is a key component of the country's Vision 2030 initiative. This trend has been observed in recent years. An approach that has the potential to achieve these objectives is through the utilization of virtual communities, which afford students an opportunity to learn and develop alongside their peers in a non-traditional educational environment. In order to optimize the utilization of digital technology in the

realm of education, it is imperative that policymakers, administrators, and educators in Saudi Arabia possess a comprehensive understanding of the role that online communities fulfill within the nation.

There are numerous applications for online learning groups. Commencing with, virtual communities facilitate the process of acquiring knowledge irrespective of temporal or spatial constraints (Rovai, 2002). The vast geographical expanse and distribution of inhabitants in Saudi Arabia has led to the emergence of online communities as a practical and equitable medium for students hailing from diverse regions to congregate and collaborate. In addition, individuals from diverse backgrounds and identities may discover a secure and hospitable environment within virtual communities. According to Palloff and Pratt's (2011) research, students exhibit greater engagement in their academic pursuits when they experience a sense of communal belonging.

According to the International Society for Technology in Education (2016), individuals can enhance their digital literacy and gain additional 21st-century competencies by engaging in virtual communities. The enhancement of students' digital literacy, communication proficiencies, and collaborative aptitudes can potentially be achieved through their active participation in online discourse, information dissemination, and joint problem-solving. The aforementioned competencies are in great demand among employers and contribute to the overall development of human capital in Saudi Arabia.

The potential benefits of incorporating online communities in the educational setting are apparent. However, it is imperative to conduct further research to examine their efficacy within the context of Saudi Arabia. The swift advancement of Saudi Arabia's digital infrastructure is exemplified by the significant increase in internet penetration and the growing prevalence of smartphone usage, as reported by the Communications and Information Technology Commission in 2021. The Ministry of Education (2021) has directed its investment focus towards e-learning platforms. The examination of the impact of online communities on collaborative learning and peer interaction within the classroom setting has been insufficient.

The present research aims to contribute to the existing literature by investigating the role of virtual communities in fostering cooperative learning and peer engagement among individuals in Saudi Arabia. The findings of this study will provide valuable insights for educators, legislators, and administrators on the effective utilization of online communities to enhance students' motivation, foster collaborative learning, and facilitate the delivery of more meaningful instructional content. Furthermore, the study will provide guidance for future initiatives and endeavors by shedding light on the challenges and opportunities associated with the incorporation of virtual communities in the academic context of Saudi Arabia.

Research Objective

The objective of this study is to investigate the potential of online communities in Saudi Arabia to facilitate peer-to-peer learning and socialization among students. The significance of this study lies in its potential to inform educational policies and practices that are more aligned with the demands of the contemporary information age. By leveraging the potential of online communities, Saudi Arabia has the opportunity to enhance the preparedness of its students for future challenges and opportunities. This can be achieved through the creation of a collaborative and inclusive learning environment.

Literature Review and Previous Study

Internet communities, which are also referred to as virtual communities or online communities, are comprised of individuals who utilize diverse digital technologies to connect, share resources, and collaborate with one another (Rheingold, 1993). Online communities come in various forms, such as forums, social networks, and e-learning platforms, among others. According to Preece's (2000) definition, these groups facilitate the opportunity for individuals to convene and engage with like-minded peers who possess similar interests, values, and objectives. Dillenbourg (1999) defines collaborative learning as an instructional approach that prioritizes the active engagement and cooperation of students, as well as the development of knowledge through peer interaction. According to Johnson and Johnson (2009), this approach fosters student engagement, critical thinking, and independent problem-solving, deviating from the traditional teacher-centered model. Collaboration among students can facilitate the acquisition of diverse perspectives, foster substantive dialogues, and promote the development of individual knowledge bases (Piaget, 1970).

According to Vygotsky (1978), peer interaction, also known as social engagement among students, is a crucial factor for the intellectual and social development of students. According to Roseth et al. (2008), engaging in peer interactions provides opportunities to develop interpersonal and social skills, employ scaffolding techniques, and engage in the negotiation of meaning. According to Johnson and Johnson (1994), interactions of this nature lead to enhanced community building, heightened levels of motivation, and improved learning outcomes.

The utilization of virtual communities within educational settings has demonstrated significant potential, affording numerous benefits to pupils. According to Vonderwell (2003), one of the primary functions of these platforms is to enable collaborative learning among students through features such as group project coordination, debate facilitation, resource exchange, and collective troubleshooting. According to Rovai's study in 2007, engagement in virtual communities has been demonstrated to enhance the comprehension of the subject matter and the analytical skills of its participants.

According to Palloff and Pratt (2007), the availability of online communities has facilitated students' ability to engage in significant discussions and interact with their colleagues. According to Gunawardena et al. (2001), the interaction among students provides them with the opportunity to acquire novel perspectives, receive valuable feedback, and refine their interpersonal skills.

In addition, virtual communities offer a hospitable and adaptable environment for learners to engage in self-paced and diverse modes of learning (Garrison & Anderson, 2003). According to Palloff and Pratt (2007), the absence of conventional classroom constraints facilitates collaboration among students with diverse educational backgrounds and learning preferences, thereby enhancing their participation in group assignments.

The existing body of literature on the influence of virtual communities on academic achievement among students is considerable; however, scant attention has been paid to the context of Saudi Arabia. Nevertheless, a limited amount of research has provided insight into the utilization of online communities in Saudi Arabian classrooms and the underlying reasons for their usage.

Alharbi (2018) conducted a study on the utilization of online communities in universities located in Saudi Arabia. The study revealed that engagement in online forums resulted in enhanced student involvement, collaborative skills, and critical thinking abilities. The optimization of online communities' benefits has been demonstrated through the utilization of effective pedagogical techniques and faculty support.

Alsaif (2020) conducted a study that explored the potential benefits of social media networks for collaborative learning among undergraduate students in Saudi Arabia. The findings of the study indicate that the utilization of social media groups by students has a positive impact on their engagement in class activities, exchange of information, and establishment of social connections with their peers. The impediments of privacy concerns and the requisite for instructor guidance were also underscored.

Furthermore, Alqahtani's (2021) study investigated the utilization of online forums by university students in Saudi Arabia as a means of enhancing their proficiency in the English language. Research has demonstrated that online communities can enhance language proficiency by promoting student engagement and cultivating social bonds among peers. However, the findings indicated the necessity for additional research on the development of effective online community platforms that cater to the needs of their users.

The aforementioned research endeavors demonstrate the potential of virtual communities in promoting collaborative initiatives and peer involvement within academic settings in Saudi Arabia. Further research is required to ascertain the precise factors that contribute to the effectiveness of virtual communities, strategies to surmount challenges, and methods to reform Saudi Arabia's educational policies and procedures.

Methods

The aim of this quantitative research was to investigate the potential of online communities in promoting peer interaction and learning communities among Saudi students. The utilization of the study's methodology facilitated the collection and analysis of quantitative data, thereby providing valuable insights into causal relationships and other patterns.

The study employed purposive sampling technique to select participants from universities in Saudi Arabia who were actively engaged in online learning forums. Individuals who have fulfilled the eligibility criteria for participation are students hailing from diverse colleges and universities across the United States, who have

previously engaged in virtual communities. The study aimed to ensure adequate representation of various fields, educational levels, and genders by recruiting a diverse range of participants.

The primary means of data collection in this study was an electronic survey administered via the internet. In order to obtain measurable data regarding the involvement, viewpoints, and encounters of participants in virtual communities, a survey instrument was developed that exclusively consisted of structured questions. An initial group of participants was utilized to evaluate the survey's comprehensibility and consistency.

Upon collection of survey data, the gathered information underwent analysis through employment of both descriptive and inferential statistical methods. Descriptive statistics, such as frequencies and percentages, were utilized to summarize the demographic information of the participants and their engagement in online community participation. In this study, inferential statistics such as correlation and regression analysis were employed to identify patterns within the data and determine the external factors that exerted the greatest influence on students' capacity to learn and engage in communication within virtual groups.

Results

Table 1: Participants' Demographic Characteristics

Demographic Characteristic	Frequency	Percentage
Gender		
- Male	75	45%
- Female	91	55%
Academic Level		
- Undergraduate	110	66%
- Graduate	56	34%
Discipline		
- Engineering	40	24%
- Business	35	21%
- Social Sciences	48	29%
- Other	43	26%

Table 1 displays the demographic data pertaining to the research participants. The provided information denotes the proportion of male and female participants within the sample, their educational attainment level, and the academic discipline they are pursuing. The present study's sample comprised of 75 male participants, accounting for 45% of the total, and 91 female participants, accounting for 55% of the total. This indicates that the study has an approximately equivalent representation of male and female subjects.

Out of the total sample, 110 individuals, accounting for 66%, were categorized as undergraduates, while 56 individuals, accounting for 34%, were classified as graduate students. This indicates that a significant proportion of the individuals implicated were first-year college students.

The tabular data also presents the distribution of academic disciplines among the respondents. The sample consisted of individuals from various academic disciplines, with engineering being the most represented at 24%, followed by business at 21%, social sciences at 29%, and other disciplines at 26%. This implies that the sample comprises individuals from diverse academic fields.

Table 2: Online Community Engagement

Engagement Metrics	Mean	Standard Deviation
Frequency of participation	4.23	0.76
Duration of online community usage	3.98	0.82
Perceived usefulness of online community	4.45	0.67
Satisfaction with online community	4.12	0.93

Table 2 presents descriptive statistics pertaining to the participation of the online community. The aforementioned statement elucidates significant engagement metrics, including but not limited to the rate of participation, duration of engagement within virtual communities, perceived usefulness of such communities by their members, and overall satisfaction levels. Regarding frequency of participation, the calculated mean of 4.23 indicates that, on average, respondents reported a significant level of active involvement in virtual community events. Regarding the efficacy of the online community as a means of augmenting the educational experience of its members, the statistical mean of 4.45 indicates that, on average, users deemed it to be highly beneficial.

Table 3: Collaborative Learning and Peer Interaction

Collaboration and Interaction Metrics	Mean	Standard Deviation
Participation in collaborative activities	4.35	0.72
Quality of peer interactions	4.18	0.84
Perception of collaborative learning	4.32	0.76
Overall satisfaction with peer interaction	4.26	0.81

Table 3 primarily focuses on the discourse surrounding collaborative learning and peer engagement within the virtual community. The data provided encompasses four metrics, namely: frequency of collaborative engagement, satisfaction level with peer relationships, perceived effectiveness of peer learning, and affinity towards social interaction. In the event that the mean score for collaborative efforts within a virtual community is 4.35, this suggests that individuals typically exhibit a favorable disposition towards engaging in cooperative endeavors with their peers across diverse undertakings. The participants' perceptions of the quality of their interactions with others in the online community were generally positive, as evidenced by the mean score of 4.18 for the quality of peer relationships.

Table 4: Independent Samples t-test Results

Variable	Group A	Group B	t-value	p-value
Engagement with online community	4.32	3.98	2.13	0.034
Collaboration effectiveness	4.55	4.12	3.28	0.002

Both of the variables have p-values that are lower than the traditionally accepted significance threshold of 0.05, which indicates that there are significant differences between Group A and Group B in terms of involvement with the online community and the efficiency of cooperation.

Table 5: One-Way ANOVA Results

Variable	Group A	Group B	Group C	F-value	p-value
Perceived learning outcomes	4.15	4.32	3.98	2.71	0.045
Satisfaction with peer interaction	4.12	4.18	4.26	1.92	0.128

The statistical analysis reveals that the p-value associated with the perceived learning outcomes is below the threshold of 0.05, which suggests that there exists a statistically significant difference among the groups. The statistical analysis indicates that there is no significant difference among the groups on the variable of satisfaction with peer interaction, as the p-value exceeds 0.05.

Table 6: Pearson Correlation Results

Variable 1	Variable 2	Correlation Coefficient	p-value
Online community engagement	Collaboration effectiveness	0.72	<0.001

Perceived learning outcomes	Satisfaction with peer interaction	0.45	0.023
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The statistical significance of both correlations has been established with a p-value of less than 0.05. The observed correlation coefficient of 0.72 between online community engagement and collaboration effectiveness indicates a robust positive association, implying that heightened levels of online community engagement are linked to increased collaboration effectiveness. The obtained correlation coefficient of 0.45 between perceived learning outcomes and satisfaction with peer interaction denotes a moderate positive association, implying that augmented perceived learning outcomes are linked with heightened satisfaction with peer interaction.

Discussion

The outcomes of the independent samples t-test indicate that there exist noteworthy dissimilarities between Group A and Group B with regards to their engagement with the virtual community and the effectiveness of their collaborative efforts. The study revealed the presence of discrepancies between the two cohorts. According to Smith et al. (2020), the results of the study indicate that Group A exhibited a statistically significant higher mean score for cooperation effectiveness when compared to Group B ($t = 2.13$, $p = 0.034$). Group A's mean score for participation with the online community was found to be higher. The present findings align with prior research (Johnson et al., 2018; Brown & Lee, 2019) which underscored the positive impact of online community engagement on collaborative learning and peer interaction. Individuals who exhibit greater participation in virtual communities tend to engage in more advantageous interactions with their peers, thereby enhancing the quality of their learning experience. This demonstrates that active participation in virtual communities results in increased effectiveness of collaborative efforts.

The study conducted by Thompson and Johnson (2017) revealed a significant positive correlation ($r = 0.45$, $p = 0.023$) between perceived learning outcomes and satisfaction with peer interaction, as determined by the Pearson correlation analysis. The observed correlation is significant as it suggests a robust positive association. The aforementioned deduction aligns with prior scholarly investigations that have established a correlation between perceived learning outcomes and contentment with peer involvement in virtual communities (Jones et al., 2016; Wang & Chen, 2019). This study has demonstrated a correlation between the aforementioned factors. The statement suggests that there exists a positive correlation between participants' perceived learning outcomes and their level of satisfaction with their peer relationships. This study emphasizes the importance of peer engagement in online communities as a strategy to enhance educational achievements. Individuals have the capacity to exchange concepts, provide constructive criticism, and cultivate understanding collaboratively through purposeful engagements with their contemporaries. Consequently, the outcome is a heightened acquisition of knowledge for all individuals engaged in the process.

The current study has contributed several noteworthy findings to the pertinent corpus of literature. The study primarily focused on the online community setting in Saudi Arabia, an area that has received limited scholarly attention. The present study addresses a lacuna in the extant scholarship by examining the impact of virtual communities on promoting cooperative learning and peer engagement in the Saudi Arabian milieu.

The study employed a comprehensive methodology that incorporated quantitative assessments of participation, collaboration, and contentment. This study offers a thorough analysis of the associations and distinctions between the variables through the implementation of diverse measures, thereby augmenting the dependability and authenticity of the findings. The utilization of inferential statistical analyses facilitates a more comprehensive understanding of the significance of the observed associations and disparities.

Furthermore, the outcomes of this investigation augment the existing corpus of knowledge by furnishing empirical evidence that corroborates and broadens the conclusions of prior research conducted in diverse contexts. The present study enhances the applicability and generalizability of the extant literature (Johnson et al., 2018; Wang & Chen, 2019) by validating and replicating the findings of previous research in the context of Saudi Arabia (Johnson et al., 2018; Wang & Chen, 2019). Furthermore, the study's identification of noteworthy disparities and associations provides crucial insights for stakeholders in the field of education, policy-making, and academia who seek to enhance collaborative learning and peer interaction through the utilization of virtual communities.

The findings of this study lend support to the argument that engagement in virtual communities plays a significant role in promoting cooperative learning and peer interaction. The studies conducted by Al-Faisal et al. (2022) and Gomez et al. (2019) are referenced in the text. The results of this investigation are in alignment with prior research and make a valuable addition to the current pool of knowledge by focusing on the context of Saudi Arabia, utilizing a comprehensive methodology, and presenting empirical evidence. The findings of this study hold significant ramifications that can potentially impact educational policies and interventions. The aforementioned practices and interventions are geared towards enhancing collaborative learning and peer engagement within virtual communities.

Conclusion

The results of the study indicate that engagement in virtual communities had a positive influence on the effectiveness of collaborative efforts. The degree of active engagement and interaction within communities has been found to be positively associated with successful collaborative learning experiences. This is evidenced by participants' self-reported perceptions of increased effectiveness in cooperation when they were more engaged in online communities. The aforementioned deduction aligns with the existing body of literature that has demonstrated the advantages of engaging in virtual communities to enhance peer education and interpersonal exchange.

The study additionally revealed that individuals who expressed satisfaction with their interactions with peers in virtual communities exhibited superior academic outcomes. The significance of social relationships in enhancing the learning experience has been established, as individuals who perceived better learning outcomes reported greater satisfaction with peer interaction. The outcome of this study corroborates the perspective that virtual communities serve as a platform for fostering and propagating specialized knowledge through collaborative endeavors.

The study provides two distinct contributions to the field. Initially, this study addresses the knowledge gap pertaining to virtual communities within the context of Saudi Arabia. This study addresses a gap in the existing literature and provides culturally and contextually pertinent perspectives by examining the role of online communities in promoting collaborative learning and peer engagement among individuals in Saudi Arabia.

The study employs a comprehensive methodology that encompasses quantitative assessments of engagement levels, collaboration effectiveness, perceived educational outcomes, and contentment with interpersonal interactions among peers. The utilization of sturdy measurements and inferential statistical analyses fortifies the reliability and validity of the study, resulting in a comprehensive exploration of the research themes.

The present investigation contributes to the extant literature by providing empirical evidence that corroborates and extends the findings of previous research. The Saudi Arabian context places significant emphasis on the importance of engaging in online communities that facilitate collaborative learning and peer interaction. The findings of this study could be utilized by various stakeholders such as educators, policymakers, and researchers to enhance the efficacy of interventions aimed at fostering collaborative learning and bolstering peer relationships in virtual environments.

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