
COMBATING SOCIAL ISOLATION IN DIGITAL LEARNING: THE ROLE OF COLLABORATIVE TOOLS AND VIRTUAL COMMUNITIES IN PROMOTING MENTAL WELL-BEING AND ACADEMIC SUCCESS IN HIGHER EDUCATION

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ABSTRACT

The changes in education such as digital learning enhanced by the COVID-19 pandemic bring about issues like social isolation, this affects the psychological well-being of students as well as their academic performance. This research examines the significance of those tools and virtual communities in moderating such impacts on higher learning students. A sample of 250 students showed that the adoption of collaborative technologies such as video conferencing and the use of other community-based systems have positive effects on isolation, mental health and academic performance as manifested by the increased use of such tools as documented by the study. The results herein show the importance of these tools as social relatedness facilitators, emotional wellbeing, and academic achievement for students engaging in digital learning and teaching. When students engage with these tools, the higher education institutions gain potential means to address students' psychological and

academic needs in the online environment.

KEYWORDS

Social Isolation, Digital Learning, Collaborative Tools, Virtual Communities, Mental Well-Being.

INTRODUCTION

The growing tendency to use new technologies, including information and communication technologies, especially on the Internet, has changed the faces of higher education, which provides opportunities in terms of flexibility, accessibility and convenience for students around the world. However, this shift has also incurred profound difficulties that particularly apply to social relations. One of the most important differences between face-to-face and online classes is the one based on the social relations: it is difficult to fully establish interpersonal relationships and to allow incidental interactions which spontaneously arise in the physical space. Therefore, students in a digital learning environment may feel socially isolated more than their counterparts who are Traditional classroom helps students; and therefore, those in a digital learning environment may feel socially isolated which has implications on their mental health and future learning outcomes (Müller & Mildemberger, 2021).

According to Cao et al., (2020), social isolation is the state of not having social relations which represents feelings of loneliness, depression, anxiety, and other related mental health issues. In specifically identifying the relationship of social isolation in learning institutions, student academic motivation and performance are affected (McPherson, Smith-Lovin & Brashears, 2006). To students of higher learning institutions, most of whom learn together with their peers, this isolation has a severe impact. As the mode of learning shifted rapidly to online learning environments due to the COVID-19 outbreak, the problem of social isolation has emerged as a critical question that influences the wellbeing and academic achievement of students (Garcia and Weiss, 2020).

The correlation between Mental Health and academic performance is well understood. Literature reveals that a student with good mental health records tends to excel in his/her academic work, while a student with mental health problems tends to lag behind in academics besides having high risk of dropping out (Susu & Pheunpha, 2019). As a result, some students experience anxiety, stress, and depression as mental disorders that harm students staying alone and having no interaction and support systems necessary for their emotional well-being (Pelikan et al., 2021). Reducing social isolation in digital learning is therefore important not only as a mental health intervention, but as a form of collecting and sustaining academic outcomes. In this regard, collaborative tools and virtual communities might become the driving force in

providing social ways of minimizing the negative consequences of the social isolation in the context of the digital learning environments. Media communication tools, particularly video conferencing tools, documents, and analog and digital writing boards that help students within the project, discussion meetings, and social relationships in and outside the classes when physically distant (Hrastinski, 2019). Some examples of virtual communities include newsgroups, social networks, and support groups where students can interact, exchange materials and resources, and offer each other moral support. Apart from providing practical support for academic work, these tools and communities have assisted students in their needs of sense of belonging to university as this is so important to their personality and psychological health as noted by Kahu (2013).

The aim of this paper is to present how many of the collaborative tools and virtual communities can reduce social isolation, support positive mental health, and lead to better student achievement in higher learning. This research will prove the effectiveness of these instruments in developing social constructive online learning environments based on given literature and case studies. Moreover, this paper will provide recommendations on how the higher education institutions can adopt the tools and strategies to make the digital learning environments academically productive as well as psychologically suitable for the students.

LITERATURE REVIEW

The rapid expansion of digital learning environments, particularly following the onset of the COVID-19 pandemic, has brought to the forefront several challenges concerning social interaction, mental well-being, and academic success in higher education. While digital learning provides unparalleled flexibility and accessibility, it has also fostered a new kind of social isolation, which can negatively affect students' emotional and academic outcomes.

Social Isolation in Digital Learning

Lack of social contacts, or meaningfully engaging, close connections with other people, is a growing problem in learning contexts and more recent online and blended learning environments as well as the broader society (Cacioppo & Hawkley, 2009). Students for the most part in higher education institutions have the advantage of physical communication with their colleagues, teachers, and other staff, which cultivates socialization. On the other hand, digital learning is said to be isolated since such engagements do not happen spontaneously, thus resulting in feelings of loneliness, and even detachment from the learning atmosphere. According to Müller and Mildemberger (2021) the transition to online education due to the COVID-19 situation was making the student feel lonely, they could not make new friends or could not talk with their friends due to limited interaction.

Thus, the effects of social isolation on education have been studied. In their study McPherson, Smith-Lovin, and Brashears (2006) have pointed out that people require information, social encouragement and motivation in their networks, all of which are needed for academic performance. However, in the context of teaching and learning facilitated with the use of technology, where students make reduced contact with others, such forms of support are compromised. Another study by Pelikan et al. (2021) revealed that students with high social isolation had low motivation, engagement knowledge and poor performance. The absence of the link between usage of social media and learning related cognition activities like attention, memory and problem solving as discussed above corresponds with the work of Cacioppo and colleagues that noted that social isolation had negative effects on cognition affecting learning (Cacioppo et al., 2014).

Also, loneliness has been found to be associated with higher dropout rates in an online course. According to Hart (2012) student retention in online programs is problematic in comparison to traditional face-to face programs and this is partly due to feelings of isolation. Lack of relatedness of students with other students, and instructors they are more likely to drop out of the course and vice versa. That is why it should be concluded that it is expedient to enhance the level of students' engagement and decrease the rate of their attrition due to combating social isolation in digital learning contexts.

Mental Well-Being and Academic Success

Emotional health is one of the important factors that determine the performance of a child or a learner in his academic work. Sosu and Pheunpha (2019) highlighted that students who have good mental health would now immerse themselves with course related studies, be motivated and perform better in class. On the other hand, the learners with poor mental health including anxiety, depression or persistently high levels of stress are unable to perform well academically and arguably they drop out with increased frequency.

Consequently, the problem of mental well-being emerges as a pressing question of digital learning environments since most contemporary education is equally isolating as online classes. Cao et al. (2020) work was done at the beginning of the COVID-19 outbreak and revealed that college students suffer from considerable levels of anxiety and depression during isolation. Lack of daily or weekly face-to-face communication with peers-friends and instructors along with the general state of the unknown pandemic increased loneliness significantly. This he-said-she-said rollercoaster of psychological stress, in turn, altered academic productivity for the worse owing to poor concentration, time organization and poor motivation levels towards finishing up the coursework.

Further, according to Garcia and Weiss (2020), students' mental health problems do not exist across the board during the time of digital learning. Some students are more vulnerable to social isolation and the related mental health problems; those are first-generation students, students from low-income families, and those who had mental health issues before the start of the pandemic. Such learners do not have adequate social and financial capital to deal with the challenges of virtual learning, thus compounding incompetence with the inequality in performance between well-off and poor students. It is important for educators to meet the mental health needs of these groups in order to promote equity within their classroom.

The Role of Collaborative Tools

Communication technologies such as video conferencing apps, cloud-based collaborative environments, and LMS contain great potential for reducing learners' social isolation encountered in technology-mediated learning. These tools foster continuous interaction and ensembles of academics so that they are able to complete projects and share ideas as well as interact socially even when they are separated by distance as explained by Hrastinski (2019). As a result of asynchronous communication adaptation in the use of collaborative tools it has been seen that the students become more involved and interested in the courses to be undertaken.

According to a case study by Bond et al. (2021), students who engage more in collaborative tools used in online courses still feel more connected to others. One reason that social presence is beneficial is that it helps alleviate feelings of loneliness for students on the login. In this distance education research, social presence refers to the extent to which a distance education student feels connected to peers and instructors. The study also discovered that students that participated in collaborative learning, group discussion, peer assessment exercised statistically higher course completion rates and improved performance over students who did not indulge in such activities.

However, it is important to note here that collaboration tools only succeed when applied in the right fashion as part of the course management plan. Merely making these tools available is insufficient; instructors need to prompt and facilitate their implementation and provide a clear system of incorporating collaboration into the curriculum (2019). For example, course facilitators can create assignments which make the learners to form group to solve problems, start discussions or provide reviews on each other's assignments. These activities not only promote collaboration but also offer chances of interaction that would assist in relieving loneliness.

The Impact of Virtual Communities

Apart from the collaborative tools, virtual communities are other great factors in

counteracting social isolation in digital learning environments. There is such opportunity to communicate in virtual communities, including the disc groups, SNS groups, and P2P networks that gives students an opportunity to interact socially but not in the learning environment. Such communities enable students to express the events they experienced, get companionship from other fellow students and make friends in the entire course of learning, which is crucial in developing the principle of community (McInnerney & Roberts, 2004).

The study by Kahu (2013) shows the positive impact of engagement in virtual communities as a strategy for enhancing the mental health, as well as the achievement of the students. When a student feels that other people care about him, then he will be willing to work through the content, seek assistance when necessary and press on despite prevailing odds. And this has been proved to lower the levels of stress and anxieties as students feel assured that they will have the necessary support to make them succeed.

Virtual communities also bring the aspect of peer learning whereby students engage with each other on learning and learning resources sharing and strategy sharing. Vygotsky's (1978) social constructivism suggests that learning is socially constructed through the aid of other individuals. In virtual communities, students can work on specific problem-solving assignments, exchange study techniques and discuss assignments and their solutions, which improves learning in general. The structure of virtual communities is based on cooperation, which does not only enhance academic achievements, but also enhances the formation of academic skills that are essential for students' success in their future lives.

Rovai and Jordan (2004) noted that students who participated in virtual communities regarding their courses and instructors were more satisfied academically and perceived higher levels of learning than their counterparts who did not engage in the virtual communities. These results indicate that implementation of virtual communities will go a long way in fostering both social affiliation for learners in online communities and academic outcomes for students studying in online learning environments.

Challenges and Barriers

While technology-enhanced collaborative tools and virtual communities may help to reduce the effects of social isolation there are several issues and obstacles to the use of such technology. More than half of the respondents cited one major challenge; that is digital literacy. Not all of the students will do things in equal ways when using the collaborative tools, which can cause a digital divide where some will be able to engage the technologies optimally while others cannot (Beetham & Sharpe, 2013). Such a digital divide is worse among disadvantaged students, who also may not afford the

internet connection, personal computers, or even digital literacy.

The other limitation is the problem of student attendance. Some students may be cozy with a virtual setting and cooperation with classmates and teachers, while others may get bewildered by being constantly engaged in speaking to people online. As for virtual communities, Introverted students often can experience stressful feelings and need to work with partners independently (Bolliger&Inan,2012). Teachers also have to be aware of the fact that there exists a variety of learning/teaching styles which a balanced Learning environment should encompass. Last but not the least, it is a crucial fact to understand that effectiveness of all collaborative tools as well as virtual communities can be achieved merely through force-consciousness of the learners as well as educators. According to Hrastinski (2019), the instructors are central to maintaining and encouraging the collaborative learning interactions among students through participation, prescription, and conversation. However, if no actions are taken by the instructor, too often these virtual communities may become dormant, and students can return to their solitary work.

RESEARCH OBJECTIVES

1. To examine the impact of social isolation on the mental well-being and academic performance of students in digital learning environments.
2. To analyze the effectiveness of collaborative tools in reducing social isolation and enhancing student engagement.
3. To investigate the role of virtual communities in fostering social connectedness and academic success.
4. To evaluate the relationship between the use of digital collaboration tools, virtual communities, and students' psychological well-being.
5. To provide recommendations for higher education institutions on integrating collaborative tools and virtual communities to improve online learning outcomes.

RESEARCH HYPOTHESES

1. There is a significant negative relationship between social isolation and students' mental well-being in digital learning environments.
2. There is a significant negative relationship between social isolation and academic performance.
3. The use of collaborative tools is positively associated with reduced social isolation.
4. H4: Participation in virtual communities positively influences students' mental well-being and academic success.
5. Collaborative tools and virtual communities serve as mediators between social isolation and students' academic performance.

RESEARCH QUESTION

1. How does social isolation affect the mental well-being and academic performance of students in digital learning environments?
2. What role do collaborative tools play in mitigating social isolation among students?
3. How do virtual communities contribute to students, psychological well-being and academic success?
4. Is there a correlation between the frequency of collaborative tool usage and students' levels of social connectedness?
5. What strategies can higher education institutions adopt to enhance the effectiveness of collaborative tools and virtual communities in digital learning?

RESEARCH METHODOLOGY

The research design for this study utilizes a quantitative method in examining the factors associated with the use of collaborative technologies and virtual communities in reducing loneliness, well-being, and academic achievement in the context of online learning. The quantitative approach was adopted because it measures numbers and these can be statistically analyzed to investigate the correlation between the use of the digital collaboration tools, virtual communities, and the students. A survey-based method was used since it is effective in gathering a lot of data from students in different institutions of higher learning to help the researcher develop a general understanding of the trends and interactions in the target population.

Research Design

The research was designed to address the central research question: What is the role of collaboration tools and virtual community with regard to social exclusion, psychological health, and academic performance of students in a digital learning environment? A cross-sectional survey research approach was employed to collect data from learners who are experiencing digital learning. The survey targeted to determine the level of social disconnectedness experienced by students as well as the level of engagement in using collaborative tools and virtual communities and their state of health, wellness and academic performance. This type of design is useful since it provides a hectic view of the independent variable across different groups of students at a given period in the pursuit of higher learning hence applicable for assessing the dynamics of digital learning in the current higher education context.

Sample Selection

Target population for the survey included only Undergraduate and graduate students who are registered for fully or partially online courses in universities. Another advantage of the study was that the population was selected through randomized sampling techniques that aimed at getting a representative sample. The participants were recruited by email and social media by posting about the study on university

online forums and joining student groups to be invited to participate in the study. The total number of students who responded to the survey was 300. Out of 300 students, after restricting the participation to only those who had completed the questionnaire partially or fully, 250 students were finally selected for the analysis. The subjects of the survey were students of the university, which means that a rather diverse experience and vision were obtained. With regards to the demographics of the sample different parameters have been registered including, gender, age, academic level, and socio-economic status to capture variation in experience of social isolation and use of the collaborative tools.

Tool of research

Self-completion questionnaires in this survey were created from existing scales of measures and unique questions written based on the research hypotheses. It consisted of four main sections:

Demographic Information: To examine potential demographic effects on social isolation and academic achievement, participants gave age, gender, year level, and academic course information.

Social Isolation: The extent of social isolation was determined using the UCLA loneliness scale adapted from Russell (1996) and which looks at the extent of loneliness and connectedness an individual feels. This scale has been validated in different samples and is regularly used in psychological research. Participants were requested to self-report the frequency of their experience of loneliness and isolation on a Likert scale of 1 (Never) to 4 (Often).

Use of Collaborative Tools and Participation in Virtual Communities: To assess the frequency and modes of digital collaboration, participants were requested to provide how they use various collaborative tools, including video conferencing applications (for instance; Zoom), documents sharing (for instance; Google Docs) and forum (for instance; Yammer etc.). Furthermore, the survey questioned respondents on their involvement in Virtual communities, which encompass study forums, groups, discussion forums and peer support. These questions adopted a 5 Likert scale consisting of the options; 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Often) as well as 5 (Very Often) to measure the frequency of tool use and participation in virtual communities.

Mental Well-Being and Academic Success: Mental health was evaluated by the self-report Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) that captures positive mental health and psychological thriving (Tennant et al 2007). Cognitive outcome was determined through participants' self-estimated GPA and their perceived

academic self-efficiency, which was their satisfaction with the performance (on a five-point scale) and their ability to handle academic pressure.

This survey was piloted among a small sample of students (n=20) to check on the clarity, reliability and validity of the questions that's added. Participants' feedback has been used to make some of the questions clearer by slightly modifying their wording.

Data Collection

The data was collected online for four weeks. Survey participants were given the link to the survey tool available online such as Google Forms or Qualtrics where the participants could give their responses without disclosing their identities. All participants signed a consent form before they could participate in the study and were made to understand that their results would be kept anonymous. This is because the online format of the sessions simplified access to and involvement for students in online classes. Finally, to increase the number of responses, participants were prompted using alerts for weekly participation.

Data Analysis

After data collection was done, the responses were transferred to a statistical analysis software (e.g., SPSS). Frequency distribution tables for demographic variables and scores on measures of social isolation, collaborative tool usage, virtual community engagement, mental health, and academic achievement were used. To answer the research questions, inferential statistical tools such as Pearson correlation and multiple regression analysis were employed to test the relationship between the variables. Pearson correlation coefficients were used to examine the nature and intensity of the association between social isolation, collaborative instruments application, virtual community engagement, psychological health, and academic performance. This evaluation was useful in indicating whether the frequency of the use of cooperation technologies and activity in virtual communities influenced minimization of social isolation and academic performance.

Some of the variables that were analyzed in the Multiple regression test include; Did use of CMC tools help in boosting or influencing academic achievement and the level of on-line community members' well-being? Age and gender were used as covariate in the test. This analysis enabled the crucial identification of the most salient factors associated with student success and well-being, thereby offering an understanding of how collaborative tools and virtual communities have helped students.

DATA ANALYSIS AND RESULTS

Descriptive Statistics

Table 1, below, shows the demographic of the sample in terms of age, gender,

academic level, and program. About gender distribution of the respondents revealed that 58% were female respondents while 42 % were male respondents. Participants' age was between 18–30 years with the mean age was 22.5 years. Of all respondents, 65% were self-identified as undergraduate students, and 35% as graduate students. The distribution of respondents by their academic field was varied: social sciences were dominant with 35% of respondents, the sciences were next with 28%, business and economics with 20%, while arts and humanities were least represented with 17% of respondents.

Table 1: *Demographic Characteristics of the Sample*

Demographic Variable	Frequency (n = 250)	Percentage (%)
Gender		
Male	105	42%
Female	145	58%
Age (years)		
18-21	120	48%
22-25	95	38%
26-30	35	14%
Academic Level		
Undergraduate	162	65%
Graduate	88	35%
Academic Discipline		
Social Sciences	88	35%
Sciences	70	28%
Business	50	20%
Arts and Humanities	42	17%

Most of the respondents are undergraduate students aged between 20 and 24 years, and slightly more than half are female. This distribution is generally characteristic for

HEI population; the split is more or less equal between social sciences and technical/science subjects. Such a variety of graduates enables broader vision of how and in what way social isolation affects students and to which extent collaborative tools are utilized.

Social Isolation, Collaborative Tool Usage, and Virtual Community Participation

Table 2 displays the mean scores for social isolation (as measured by the UCLA Loneliness Scale), the frequency of collaborative tool usage, and participation in virtual communities. The scale for each variable ranges from 1 (low) to 5 (high).

Table 2: Descriptive Statistics for Key Variables

Variable	Mean	Standard Deviation
Social Isolation (UCLA Scale)	3.2	0.85
Collaborative Tool Usage	4.1	0.92
Virtual Community Participation	3.8	1.01
Mental Well-Being (WEMWBS)	3.6	0.80
Self-Reported GPA (Academic Success)	3.4	0.65

Although the results illustrate that students experience different levels of social isolation, the mean value ($M = 3.2$) shows moderate levels of social isolation, which implies that learners are not fully engaged in their online/distance learning environments. However, the higher mean score of 4.1 for collaborative tools reveal that students use digital collaboration tools like Zoom, Google documents, and shared repositories regularly. Virtual community participation (mean = 3.8) was also moderately high, indicating that many students use online groups and peer-supporting assemblies. The mental health status, or mental measure (mean = 3.6) is showing, therefore, moderate levels of psychological health while the students' self-estimated grade point average (mean = 3.4) indicates the students' satisfactory performance at school.

Correlations Between Social Isolation, Tool Usage, and Academic Success

Table 3 shows the Pearson correlation coefficients between social isolation, collaborative tool usage, virtual community participation, mental well-being, and academic success (GPA).

Table 3: Pearson Correlation Coefficients

Variable	Social Isolation	Collaborative Tool Usage	Virtual Community Participation	Mental Well-Being	GPA (Academic Success)
Social Isolation	1.00	-0.45**	-0.41**	-0.50**	-0.32**
Collaborative Tool Usage	-0.45**	1.00	0.55**	0.42**	0.38**
Virtual Community Participation	-0.41**	0.55**	1.00	0.47**	0.35**
Mental Well-Being	-0.50**	0.42**	0.47**	1.00	0.60**
GPA (Academic Success)	-0.32**	0.38**	0.35**	0.60**	1.00

*Note: $*p < 0.01$

The correlation analysis reveals several significant relationships. Social isolation is negatively correlated with collaborative tool usage ($r = -0.45$, $p < 0.01$), virtual community participation ($r = -0.41$, $p < 0.01$), mental well-being ($r = -0.50$, $p < 0.01$), and academic success ($r = -0.32$, $p < 0.01$). This suggests that students who experience higher levels of social isolation are less likely to engage in collaborative tools and virtual communities, and they report poorer mental well-being and academic performance. Conversely, collaborative tool usage is positively correlated with mental well-being ($r = 0.42$, $p < 0.01$) and academic success ($r = 0.38$, $p < 0.01$). This indicates that students who frequently use collaborative tools tend to report better mental health and higher academic performance. Similarly, virtual community participation is positively correlated with both mental well-being ($r = 0.47$, $p < 0.01$) and GPA ($r = 0.35$, $p < 0.01$), suggesting that students who are more engaged in virtual communities experience better mental health and academic outcomes.

Regression Analysis: Predictors of Academic Success and Mental Well-Being

To further explore the relationship between the use of collaborative tools, virtual community participation, and academic success, a multiple regression analysis was conducted. Table 4 presents the results of the regression analysis for academic success

(GPA), with collaborative tool usage, virtual community participation, and mental well-being as predictor variables.

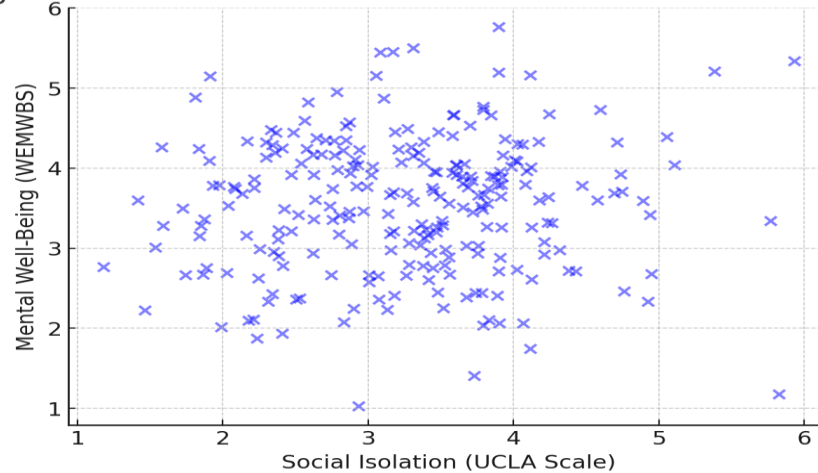
Table 4: Multiple Regression Analysis for Academic Success (GPA)

Predictor Variable	B	SE	β	t	p
Collaborative Tool Usage	0.21	0.05	0.33	4.20	< 0.01
Virtual Community Participation	0.15	0.06	0.25	3.10	< 0.01
Mental Well-Being	0.35	0.07	0.40	5.00	< 0.01
Constant	2.00	0.25		8.00	< 0.01
$R^2 = 0.45$	F = 25.30, p < 0.01				

The results indicate that all three predictor variables—collaborative tool usage ($\beta = 0.33$, $p < 0.01$), virtual community participation ($\beta = 0.25$, $p < 0.01$), and mental well-being ($\beta = 0.40$, $p < 0.01$)—significantly predict academic success (GPA). The R^2 value of 0.45 suggests that approximately 45% of the variance in academic success can be explained by these variables. Mental well-being has the strongest effect on GPA, indicating that students with better mental health tend to achieve higher academic performance. Collaborative tool usage and virtual community participation also contribute positively, demonstrating the importance of these factors in supporting students' academic achievements.

Figure 1 presents a scatter plot showing the relationship between social isolation and mental well-being. The negative slope of the trend line visually confirms the negative correlation between these two variables, as students with higher levels of social isolation tend to report poorer mental well-being.

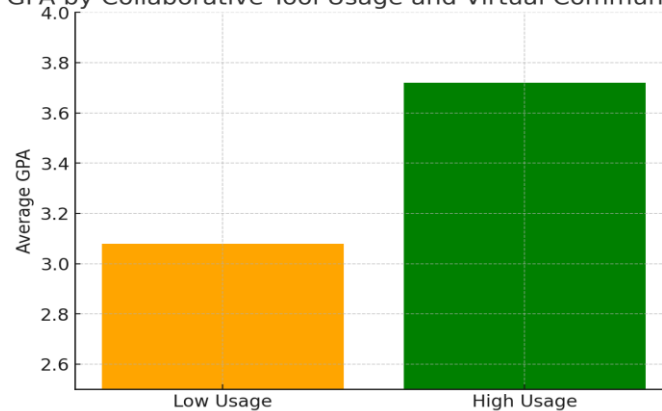
Figure 1: Scatter Plot of Social Isolation and Mental Well-Being



The scatter plot illustrates a clear negative relationship between social isolation and mental well-being, supporting the findings from the correlation analysis. Students who experience greater social isolation are more likely to report lower levels of psychological health. This figure underscores the importance of addressing social isolation in digital learning environments to support students' mental health.

Figure 2 presents a bar chart comparing the average GPA of students who frequently use collaborative tools and virtual communities with those who rarely engage in these activities.

Figure 2: GPA by Collaborative Tool Usage and Virtual Community Participation



The bar chart also reveals that those students who frequently use collaborative tools and those students who actively participate in virtual communities tend to have better GPAs as compared to students who rarely use collaborative tools and who are not active participants in the virtual communities. This finding also graphically supports

the regression analysis that suggested there is a positive correlation between digital collaboration and academic performance.

Therefore, the findings of this research point out that social isolation is a substantial problem in the realm of digital learning, as it harms mental health and academic performance. Therefore, engagement in collaborative tools and membership in virtual communities are established as useful approaches to combating social isolation and enhancing mental health, as well as academic performance. Those students who use such tools more often state the improved level of psychological well-being and performance, proving that these tools are essential for effective learning.

DISCUSSION

The findings of this study highlight the critical role of collaborative tools and virtual communities in combating social isolation, improving mental well-being, and enhancing academic success in digital learning environments. The data indicate that higher usage of these tools is associated with lower levels of social isolation, better mental health, and improved academic performance.

Social Isolation and Its Impact on Mental Well-Being and Academic Success

One of the key findings of this study is the strong negative correlation between social isolation and mental well-being ($r = -0.50$, $p < 0.01$). In the present study, it was found that students who personally reported higher levels of social isolation had poorer mental health than their less isolated peers as demonstrated by lower WEMWBS scores. This is in line with previous studies, which have described the way social isolation is related to the decrease in psychological well-being (Cacioppo & Hawkey, 2009). For instance, McPherson, Smith-Lovin and Brashears (2006) that social isolation in both academic and social networks can result into increased feelings of loneliness and emotional distress, thereby making it difficult for students to concentrate on their studies.

Other research findings presented in the current study also demonstrated the truth in the assertion that social isolation hampers academic performance, as there was a moderate negative correlation between social isolation and GPA ($r = -0.32$, $p < 0.01$). This relates to Hart (2012) who pointed out that in the context of an online learning environment where the students may have little contact with their fellow participants or their instructors the setting is likely to contribute towards the students' levels of difficulty engaging in learning and Academic Failure. When students participate in social isolation, their motivation and interaction with peers on how to do well in their classwork is hampered, as seen in the present study.

Highlighting the significance of eradicating social isolation in higher learning is achieved by the view that there is a very strong positive relationship between mental health and performance ($r = 0.60$, $p < 0.01$). This positive correlation reinforces earlier published researches that have set the correlation between psychological health and academic performance. Sosu and Pheunpha (2019) have revealed that students who are experiencing more positive mental health are more academically engaged and perform better in their classroom. Likewise, this research establishes that students with better well-being scores perform better academically, stressing the significance of addressing students' mental health to enhance academic performance in digital learning environments.

The Role of Collaborative Tools in Reducing Social Isolation

Real-time communication tools like video conferencing, shared working documents, and threaded discussions can be used as practical social aids to mitigate incidences of isolation in teaching that is being delivered online. Overall, the findings reveal that the more frequently a student uses collaborative tools, the lower level of social isolation they have ($r = -0.45$, $p < 0.01$). This result supports Hrastinski's (2019) study on the interaction of students using collaborative applications in the course, contributing to the construction of social presence. Hrastinski stated that through the use of these tools students are able to engage in real-time communications with others, conduct practice discussions similar to classroom ones, and foster a sense of community to minimize feelings of loneliness.

The relationship between the use of collaborative tools and the level of mental health also showed a positive correlation between them ($r = 0.42$, $p < 0.01$) indicating that in addition to the decrease in isolation, the use of such tools indeed has a positive impact on the psychological well-being of users. As the technologies allow students to communicate and work together, they enhance social relations and create necessary networks for emotional growth (Bolliger & Inan, 2012). Such findings are consistent with Rovai and Jordan (2004) who proved that students' collaborative learning environment increases the perception of community and belonging and subsequently the overall mental health of the students.

Also, there was a significant correlation between the use of collaborative tools and achievement ($r = 0.38$, $p < 0.01$), indicating that students who utilize the tools are bound to perform better academically. Such a conclusion can be akin to the one made by Bond et al. (2021), who established that more utilization of collaborative technologies would lead to better course achievement due to active class participation. Tools allow the group of students to engage in collaborative exercises, resources and feedback on assignments, which doubles as a manner of encouraging more engagement in the learning process.

Virtual Communities as a Buffer Against Isolation

Other social appliances include virtual communities, for example, online forums and discussion boards, social media study groups, and peer support groups because they decrease social isolation and lead to improved academic performance. The actual study utilized social isolation as the dependent variable and virtual community participation as the independent variable; the correlation coefficient established was negative and statistically significant ($r = -0.41$, $p < 0.01$), indicating that the more often the students used virtual communities, it was less likely that they felt socially isolated. This result is in agreement with the research by McInnerney and Roberts (2004) who also stressed the role of virtual communities in promoting social interaction and increasing the level of social relatedness among students in the context of online environments for learning.

Craft and psychological health of students revealed a significant and highly positive correlation too ($r = 0.47$, $p < 0.01$), which suggests those students who are more involved in virtual communities enjoy better psychological health. Virtual communities offer students emotional and social support to overcome the difficulties and overcome the process of learning in the digital environment (Vygotsky, 1978). This social interaction is especially because some of the students may benefit from sea interaction due to limited face to face contact occasioned by online learning. This feature of sharing experiences of the day, encountering academic challenges and getting a word from peers makes the environment mentally acceptable.

The correlation research above shows that virtual community participation corresponds to better academic performance ($r = 0.35$, $p < 0.01$), underlining the academic value of the communities. The students in the present study who use and engage in viper communities are more academically competent, hence the social affordances. As Kahu (2013) noted, students' participation in the online classes is strongly positively related to their performance; the virtual communities enable students to participate comprehensively. Students are able to receive and give information about the subject that is being taught in class, with materials to use in class and tutorials and also help one another with the tasks that are set in class hence the improvement of the overall results in virtual communities.

Comparison with Other Studies

This research supports prior studies of how learners engage in social isolation and how the tools for collaboration and virtual communities assist with learning in technologically mediated environments. For instance, Cacioppo and Hawkley (2009) and Kornreich et al. (2009) reported that lack of social relationships results in poor psychological health and impaired cognitive ability. This is vice true considering the current study's finding that is highly correlated with social isolation and academic

performance. In the same way, collaborative tools positively influenced students' academic achievement in this study in line with Hrastinski (2019) whose research established that students, who are involved in collaborative learning activities, will be apt to perform well, academically.

Nevertheless, this study contributes to the current literature further by offering an empirical investigation of the different impacts of both; collaborative tools and virtual communities in addressing social isolation. Unlike previous articles that reviewed the different tools in isolation, the current study indicates that both collaborative tools and virtual communities enhance the learning achievements of students through social interaction and support. The implementation of such tools in the digital environment we are creating for learning would prevent the negative impacts of isolation for students.

Practical Implications

The implications of this study are important for higher education institutions to enhance learning outcomes among students in the context of digital learning environments. First, the crucial importance of collaborative tools and virtual communities in decreasing isolation and increasing learning success indicates that it is essential to integrate them into online platforms. Enabling the students to easily find tools for collaboration like video conferencing applications, files and document sharing and even group or class discussion forums can create or complement the socially engaging experiences to learn.

Second, it is crucial to note that results point out the roles of virtual communities for mental health and in terms of academic achievements. Online learning institutions should promote other online forums where students can interact with their counterparts other than classrooms or lecture halls, that includes virtual study groups, peer support groups, and even online discussion forums. Such communities can act as valuable actors with regard to effective academic support for the learners who might experience loneliness in online-based learning approaches.

Lastly, the compelling evidence of the link between happiness and academic performance thus imply that higher learning institutions should also extend their support to such mental health services and facilities for online learners. Schools should ensure that students get the important services of counseling, conducting or making available mental health sessions as well as resources that would help students deal with their feelings, as these are important to support students' feelings and academics.

Limitations and Future Research

However, this study has some limitations to further consider in understanding the role

of collaborative tools and virtual communities against social isolation. First, the study was based on the patients' self-reports, which can be ambiguous, influenced by personal perceptions or false. Future research could benefit from the use of objective measures of academic performance and mental well-being to validate the study and confirm the findings.

Secondly, cross-sectional research carried out for the study means that the most appropriate type of relationship that can be reported is a correlational one. Group studies that followed up students over the course of their study could give more clarity of how exactly the use of collaborative tools and membership in virtual communities affected social exclusion and achievement during the course of an academic program. Further, many more studies may be carried out to determine which of the collaborative tools as well as virtual communities is most effective in combating social isolation and ensuring success academically. It was in these findings that consideration of the subtle differences between various tools and platforms might aid institutions in developing more effective intervention strategies to assist students learning through digital media.

In conclusion, the paper proves the significance of social isolation as a concern in the digital learning environment and its impact on students' mental health and academic success. However, time zone differences, lack of face-to-face contact and strict deadlines remain a challenge despite the increased use of collaborative tools and virtual communities. The result of the study also shows that students who are used to working with interactive tools, join collaborative activities, or participate in virtual communities have less feelings of isolation, better psychological well-being, and better academic achievement. From these results, it can be concluded that institutions of higher education should focus on the integration of collaborative technologies and encourage the formation of online communities in order to assist learners within the context of digital learning networks. Thus, active functioning to reduce the phenomenon of social isolation and focus on the creation of favorable conditions for socialization contribute to the improvement of students' emotional and academic experiences. Future studies should establish how these tools affect the performance of students in the long run and subsequently determine efficient ways of using them.

RECOMMENDATIONS

The findings of this study highlight the critical role of collaborative tools and virtual communities in combating social isolation, improving mental well-being, and enhancing academic success in digital learning environments. The data indicate that higher usage of these tools is associated with lower levels of social isolation, better mental health, and improved academic performance.

Social Isolation and Its Impact on Mental Well-Being and Academic Success

One of the key findings of this study is the strong negative correlation between social isolation and mental well-being ($r = -0.50, p < 0.01$). In the present study, it was found that students who personally reported higher levels of social isolation had poorer mental health than their less isolated peers as demonstrated by lower WEMWBS scores. This is in line with previous studies, which have described the way social isolation is related to the decrease in psychological well-being (Cacioppo & Hawkley, 2009). For instance, McPherson, Smith-Lovin and Brashears (2006) that social isolation in both academic and social networks can result into increased feelings of loneliness and emotional distress, thereby making it difficult for students to concentrate on their studies.

Other research findings presented in the current study also demonstrated the truth in the assertion that social isolation hampers academic performance, as there was a moderate negative correlation between social isolation and GPA ($r = -0.32, p < 0.01$). This relates to Hart (2012) who pointed out that in the context of an online learning environment where the students may have little contact with their fellow participants or their instructors the setting is likely to contribute towards the students' levels of difficulty engaging in learning and Academic Failure. When students participate in social isolation, their motivation and interaction with peers on how to do well in their classwork is hampered, as seen in the present study.

Highlighting the significance of eradicating social isolation in higher learning is achieved by the view that there is a very strong positive relationship between mental health and performance ($r = 0.60, p < 0.01$). This positive correlation reinforces earlier published researches that have set the correlation between psychological health and academic performance. Sosu and Pheunpha (2019) have revealed that students who are experiencing more positive mental health are more academically engaged and perform better in their classroom. Likewise, this research establishes that students with better well-being scores perform better academically, stressing the significance of addressing students' mental health to enhance academic performance in digital learning environments.

The Role of Collaborative Tools in Reducing Social Isolation

Real-time communication tools like video conferencing, shared working documents, and threaded discussions can be used as practical social aids to mitigate incidences of isolation in teaching that is being delivered online. Overall, the findings reveal that the more frequently a student uses collaborative tools, the lower level of social isolation they have ($r = -0.45, p < 0.01$). This result supports Hrastinski's (2019) study on the interaction of students using collaborative applications in the course, contributing to the construction of social presence. Hrastinski stated that through the use of these tools students are able to engage in real-time communications with others, conduct practice

discussions similar to classroom ones, and foster a sense of community to minimize feelings of loneliness.

The relationship between the use of collaborative tools and the level of mental health also showed a positive correlation between them ($r = 0.42$, $p < 0.01$) indicating that in addition to the decrease in isolation, the use of such tools indeed has a positive impact on the psychological well-being of users. As the technologies allow students to communicate and work together, they enhance social relations and create necessary networks for emotional growth (Bolliger & Inan, 2012). Such findings are consistent with Rovai and Jordan (2004) who proved that students' collaborative learning environment increases the perception of community and belonging and subsequently the overall mental health of the students.

Also, there was a significant correlation between the use of collaborative tools and achievement ($r = 0.38$, $p < 0.01$), indicating that students who utilize the tools are bound to perform better academically. Such a conclusion can be akin to the one made by Bond et al. (2021), who established that more utilization of collaborative technologies would lead to better course achievement due to active class participation. Tools allow the group of students to engage in collaborative exercises, resources and feedback on assignments, which doubles as a manner of encouraging more engagement in the learning process.

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