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Learning Mode Transitions: Effects On Student Stress And Social Dynamics

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ABSTRACT

The present study investigated how these shifting modes of learning-from a physical classroom to hybrid and completely online-influence the level of perceived stress and group dynamics among students at institutions of higher education. Educational institutions are shifting toward flexible models of learning, and it is imperative that the psychological and social repercussions of such a shift are recognized. The quantitative design was followed, in which data from 250 students spanning most areas of academic disciplines were collected through standardized instruments like PSS, along with structured social interaction surveys. The results pointed out statistically significant alterations in the level of stress and patterns of social interaction across different learning modes. The findings indicated that traditional learning environments had more frequency of interaction and perceived social support, hence less stress. On one hand, hybrid learning offers moderate amounts of support but shows inconsistencies at the same time, which may influence students' sense of stability. Fully online learning, while giving convenience and flexibility, shows high levels of perceived stress at the same time, with low levels of peer interaction and bonding among peers. From the results, one can gauge that reduced face-to-face communication, fewer collaborative opportunities, and technological fatigue together drive the academic experiences of the students. It points to the fact that, as the institutions progress with scaling online learning, they should do so simultaneously by bringing into alignment comprehensive supportive mechanisms, ensuring good mental health and positive social interactions. Such skills of virtual peer-to-peer collaboration can be developed, psychological support services provided, and the online learning environment designed in a manner that can assure its being socially lively so as to lessen the levels of stress while enhancing group cohesion. Being more inclusive toward holistic student support is the means whereby educators will ensure learning is effective, inclusive, and psychosocially sustainable across all formats.

Keywords: Student stress, social dynamics, traditional learning, hybrid learning, online learning, perceived stress scale, transitions within education, mental well-being, interaction frequency, and digital learning environments.

IINTRODUCTION

In just a couple of years, new technologies and increases in the need for adaptable learning methods have changed the educational environment. Traditional paradigms of face-to-face training in colleges and universities continue to give way to hybrid and completely online learning methods. Global tragedies, such as the COVID-19 pandemic, continue to accelerate such changes through enforcement by authorities of schools moving online. It is thus of paramount importance that academics, politicians, and teachers be informed about the way in which these changes in learning styles impact the mental health of students.

This study is informed by an awareness that the range of learning environments will impact the students differently. The traditional classroom allows for a structured environment, which is conducive to learning and group projects through fostering one-on-one interactions between students and their peers and instructors. Hybrid models allow flexibility and a sense of social connectedness in attempts to merge the best of both in-person and online features. On the extreme side, full immersion into an online setting presents a different set of issues, such as a heightened sense of isolation and heightened anxiety. According to the researchers, all these changes have the potential to considerably influence the emotional lives of students, academic performance, and relationships.

Since high levels of stress have been known to be an indicator of poor academic performance-which manifests in the form of less motivation, worse grades, and increased dropout rates, for instance-it is necessary to determine how changes in learning mode impact the levels of students' stress. Researchers in education commonly use the Perceived Stress Scale, or PSS, to measure the extent of various learning styles affecting students' levels of stress. Many students who transition into online classes report to feeling more stressed out than ever before due to the fact that they have more work, have nobody to lean on for help, and struggle to stay motivated or engaged.

Most importantly, social dynamics also play a great part in students' school experiences. Frequent interactions among and between students and instructors facilitate the latter in terms of academic performance and give them a sense of community in the classroom. Traditional classrooms allow children to further their social-emotional development through collaborative learning, discussion in groups, and even friendships. The opposite occurs when things move online, reducing face-to-face contact with colleagues and thus making people feel even more isolated. The fewer the chances for students to interact face-to-face with each other, the more the negative effects on mental health and academic performance will be multiplied.

The present paper attempts to study changes in learning modes and their influence on student stress and social dynamics by analyzing data from a wide sample of students. It focuses on the measurement of the effects that these changes have produced in their psychic state and interpersonal relations. Changes that will be analyzed involve those occurring on campus, online, and hybrid classrooms. The

variation in the frequency of social interactions and the level of stress is studied through questionnaires about social support and interaction frequency and via the Perceived Stress Scale.

The findings from this study will contribute to the literature base, which is just lately setting its eyes on the social and psychological implications of shifting modes of learning. Since education is a constantly changing process, it is an integral part of institutional functions to provide mechanisms that would facilitate the adjustment process. By focusing on students' well-being and fostering good social dynamics, the education establishment will be in a position to enhance the efficiency of learning among all students irrespective of the mode of learning.

Most importantly, implications for student stress and social dynamics should be found as educational institutions grapple with the complexities of changes in learning mode. The paper discusses urgent issues with the vision to contribute to informing educational policy and practice. Given consideration to a range of social and psychological factors that shape students' experiences across diverse classroom contexts, one may ensure that institutions work harder toward ensuring academic success with a more hospitable school climate. Far-reaching impacts that go beyond an improvement in people's lives alone can allow improvement in educational outcomes, advance equality, and develop resilient learning communities. This research has brought out the imperative necessity for addressing students' social and emotional needs in modern dynamic classrooms along with their academic needs.

From a psychosocial point of view, learning spaces are not only used for teaching and learning but also serve as important social systems that influence students' personal management of emotions, development of identity, and social interactions. Learning mode transitions affect these systems because they redefine the dynamics of communication, feedback, and social presence. If learning mode transitions result in less spontaneous communication and socialization, students are likely to experience increased levels of stress as well as decreased group cohesion. It is important to consider stress and social dynamics simultaneously because they offer a broader perspective on the impact of learning mode transitions on students' well-being, especially in higher education institutions where socialization and collaborative learning are important.

IILITERATURE REVIEW

Liu, Qingxia & Lin, Douxiu. (2024) Due to the global COVID-19 epidemic, research related to the impact of online self-learning on the social and emotional development of learners has been heatedly discussed in recent years. Based on whether the students work or not, and have a family or not, we compared their loneliness, social anxiety, social contact, and psychological health when COVID-19 started and when staying at home reached its climax. Methods 320 students were given UCLA Loneliness Scale-3, Social Anxiety Scale for E-Learning Environments, Social Interaction Scale, and Brief Adjustment Scale through an internet survey twice in 2020. The responses were compared by using Student's t-test in different stages of the online learning process. We use analysis of variance to find out how employed and jobless students with and without families were different. Final Product The severity of loneliness was the most serious among unemployed students without family members around them. Students with their family around them rated online social engagement higher.

Compared to students with jobs, students who didn't have jobs ranked higher in terms of psychological well-being at the start of the distance period and social anxiety at the end of the distance period.

Nath, Mousumi & Yadav, Dr. (2023) There is a phenomenal following of online education. For students, this means the ability to work when and where it's most convenient for them. The three broad categories of online classrooms are those that are fully web-based, those that are hybrid, and those that blend traditional classroom instruction with the use of web-based resources. That which we term "learning" herein utilizes the web for instructional purposes and for the distribution of course materials. Students these days often use internet learning resources to aid in achieving success at school. Because course materials are made widely available through social networking sites, there is the potential for online learning to reduce academic pressure. The main objective of the present study is to investigate how undergraduate students in Assam experience academic stress in relation to their experiences with online learning. The research has a descriptive orientation. There are 212 undergraduate respondents from the three universities in the Lakhimpur district. Results reveal a positive and statistically significant relationship between online learning and academic stress (r= 0.14).

Cage, Eilidh et al., (2021) There is a general consensus that transition points have the potential to adversely affect the mental and emotional wellbeing of students and for that reason remain a cause for concern. The lived experience of university staff and students in relation to transition remains understudied. The present study explores the experiences of both students and staff in regard to transitions. It considers the perceived challenges associated with transitions into, within and outside of universities, as well as the kinds of support which would be helpful during these times. Transitions and student mental health were discussed during focus groups attended by 67 students and 40 faculty members from UK universities. Thematic analysis was used to draw out the useful information from the focus groups.

Pascoe Michaela et al., 2019, there is a wide range of chronic academic stresses that students of both secondary and higher education settings endure. Previous research has shown that students who go through academic stress are bound to achieve less academically, be less motivated to remain at school, and even to the extent of dropping out. Billions of dollars are lost annually from state budgets because of the long-lasting effects that make jobs unsustainable. This narrative review discusses how recent research has talked about the effects of academic stress on the students learning and grades and on their mental health - depression, anxiety, insomnia amongst others.

Reddy, K. Jayasankara et al., (2018) The students have to face many expectations, both internally and externally, which ultimately result in stress in their academic lives. Academic stress affects adolescents disproportionately due to the many personal and social changes that occur during this phase of life. It is, therefore, important to trace the causes and effects of academic stress so that remedies may be suggested. A quantitative research design was followed, and participants from four streams-the basic sciences, commerce, management, and the humanities-were screened using the Academic Stress Scale. Gender differences were also revealed as the five source dimensions-personal inadequacy, fear of failure, interpersonal difficulties with teachers, inadequate study facilities, and

teacher-pupil relationship-were further explored. School psychologists and counsellors can contribute to the development of effective counseling modules and intervention strategies aimed at helping students alleviate stress if they are aware of the sources of stress.

Despite the fact that the existing body of research has thoroughly explored academic stress and online learning experiences, the majority of the existing literature on the topic remains fragmented in nature. Some studies focus on the outcomes of stress without taking into consideration the simultaneous effects of social interaction and group cohesion, while others investigate social engagement without exploring the relationship between the two concepts in the context of psychological stress. Additionally, the majority of the existing literature on the topic focuses on either fully online or traditional learning environments, without devoting sufficient attention to the transitional experiences between learning environments. This is especially true in the context of higher education, where students often transition between traditional, hybrid, and online learning environments within a short period of time.

As a result, there is a need for comprehensive empirical research that explores stress levels and social dynamics in multiple learning environments. In an effort to address this issue, the current study employs a holistic approach to explore the effects of transitions in learning environments on perceived stress and group dynamics, thus providing a more comprehensive understanding of students' psychological and social adaptation in modern educational environments.

IIIMETHODOLGY

A quantitative approach present in this current research aimed at measuring the change in the perceived level of stress and alteration of group dynamics of students as an effect of change in modes of learning. To make sure that all kinds of demographics participate in the process, 250 participants were chosen from different academic fields. While structured questionnaires assessed the social dynamics in terms of frequency of interaction and perceived social support, the level of stress was measured through the Perceived Stress Scale. Participants were to answer these questionnaires while transitioning from a traditional class to a hybrid or completely online class. Furthermore, statistical studies were conducted to determine how these different kinds of learning styles diverge in terms of stress and social dynamic aspects.

3.1 Research Design

This study will adopt a quantitative, cross-sectional design in investigating the effects that transitions between learning modes have on the levels of student stress and social dynamics. The quantitative design is relevant to this particular study in that it explains how quantification of psychological constructs can be done, the establishment of the relationship amongst variables, and generalization to a larger student population.

The selection of a quantitative cross-sectional research design is guided by the need to quantify the variations in stress and social dynamics associated with different learning modes at a given point in time. This research design is most suited to the investigation of psychological and social phenomena that can be quantified and compared across groups. Through the use of standardized research

instruments and statistical analysis, the study is able to maintain objectivity and rigor. In addition, the cross-sectional design is most efficient in the study of transitions between learning modes in real-world educational environments, where students are often exposed to multiple modes of instruction at once.

The following dependent variables are targeted in the study:

This may also involve the following:

1. Stress levels

Social Dynamics, assessed by:

- Frequency of Social Interaction
- Perceived Social Support

These variables were tested in three different learning modes:

- Traditional face-to-face learning
- Hybrid (Blended mode)
- E-learning: learning that is completely virtual

3.2 Population and Sampling Technique

The stratified random sample consists of 250 university students, in order to ensure that the representation is proportional to:

- Streams/ Academic disciplines: Arts, Science, Commerce, Engineering and Management
- Gender
- Year of study

Since each stratum contained an unequal number, the number of respondents had to be assigned proportionally to every stratum so there would not be any occurrence of sampling bias.

Sampling Equation

Sample size was determined by Cochran's formula for large populations:

$$n_0 = \frac{Z^2 \cdot p(1-p)}{e^2}$$

Where:

- $Z = 1.96$ (95% confidence level)
- $p = 0.5$ (maximum variability)
- $e = 0.05$ (margin of error)

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{0.05^2} = 384.16$$

Since the accessible student population was smaller than 10,000, the adjusted sample size was computed as:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

The final sample obtained was 250, which is statistically acceptable for representing medium-sized student populations.

3.3 Research Instruments

3.3.1 Perceived Stress Scale (PSS)

The level of stress was measured using the PSS-10, which is a psychometrically validated psychological scale containing 10 items rated in accordance with the Likert scale of 5-point type (0-4). Calculation of total score:

$$\text{PSS}_{\text{score}} = \sum_{i=1}^{10} X_i$$

- Xi= the score for each item.
- A high score indicates high stress.

3.3.2 Social Dynamics Questionnaire

Two subscales were used:

- Interaction Frequency Scale
- How often do students engage in interactions with peers/teachers?
- 6 items scored on 1-5 Likert scale
- Perceived Social Support Scale
- Adapted from the MSPSS (Multidimensional Scale of Perceived Social Support)
- 10 items scored on 1-7 Likert scale

Scoring based on:

$$\text{Interaction Frequency} = \frac{\sum_{i=1}^{6} Y_i}{6}$$

$$\text{Social Support} = \frac{\sum_{i=1}^{10} Z_i}{10}$$

Where Y_i and Z_i are item responses.

3.4 Data Collection Procedure

- Data were collected in three phases, corresponding to transitions between learning modes.
- Participants completed the questionnaires immediately after each transition, ensuring accurate reflection of psychological and social changes.
- All surveys were administered digitally using Google Forms, ensuring anonymity.

3.5 Variables and Operational Definitions

Table 1: Variables and Operational Definitions

Variable	Type	Operational Definition
Stress Level	Dependent	PSS score (0–40)
Social Interaction Frequency	Dependent	Average interaction score (1–5)
Social Support	Dependent	Perceived support score (1–7)
Learning Mode	Independent	Traditional / Hybrid / Online

3.6 Data Processing and Statistical Analysis

Data were analyzed using SPSS v25 and Python statistical libraries.

3.6.1 Reliability Testing

Cronbach's Alpha was used to measure scale reliability:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} \sigma_i^2}{\sigma_T^2}\right)$$

Where:

- k = number of items
- σ_i^2 = variance of each item
- σ_T^2 = variance of total score

Interpretation:

- 0.9 = Excellent
- $0.8 - 0.9$ = Good
- $0.7 - 0.8$ = Acceptable

3.7 Statistical Tests

3.7.1 Analysis of Variance (ANOVA)

Since stress levels differ across learning modes, a one-way ANOVA was performed:

$$F = \frac{SS_{\text{between}} / df_{\text{between}}}{SS_{\text{within}} / df_{\text{within}}}$$

Where:

- SS = Sum of Squares
- df = Degrees of Freedom

Null Hypothesis:

$$H_0: \mu_1 = \mu_2 = \mu_3$$

Alternative Hypothesis:

H_1: At least one mean differs

3.7.2 Paired Sample t-Test

Used to compare stress scores before and after transitions.

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

Where:

- $\bar{d}$ = mean difference
- s_d = standard deviation of difference
- n = sample size

3.7.3 Correlation Analysis

Pearson's correlation coefficient assessed relationships between:

- Stress ↔ Social Support
- Stress ↔ Interaction Frequency

$$r = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \cdot \sum (Y - \bar{Y})^2}}$$

Interpretation:

- $0.1 - 0.3 =$ Weak
- $0.3 - 0.5 =$ Moderate
- $0.5 =$ Strong

3.7.4 Regression Model

A simple linear regression was used:

$$\text{Stress} = \beta_0 + \beta_1(\text{Interaction Frequency}) + \beta_2(\text{Social Support}) + \epsilon$$

Where:

- $\beta_0 =$ intercept
- $\beta_1, \beta_2 =$ coefficients
- $\epsilon =$ error term

This helped determine how much social dynamics explained variations in stress.

3.8 Algorithmic Flow of the Research Study

The structured algorithm followed during data collection and analysis was as follows:

Algorithm : Influence analysis of learning mode transition

- Step 1: The research variable identification includes Stressors, Social Support, and Interaction Frequency.
- Step 2: Identification of sample population and adoption of stratified sampling.
- Step 3: Baseline questionnaire administration-classical mode.
- Step 4: Move students into Hybrid Mode.
- Step 5: Give second questionnaire.
- Step 6: Transition the students to Online Mode.
- Step 7: Administration of final questionnaire.
- Step 8: Data cleaning-missing values and outlier detection.
- Step 9: Calculation of Scores for PSS, Social Support & Interaction
- Step 10: The reliability test is done through the use of Cronbach's Alpha.
- Step 11: Apply ANOVA for comparing the means across modes.
- Step 12: Perform t-tests for transitions of pairs.
- Step 13: Perform Regression to Predict Stress.
- Step 14: Drawing conclusion and interpretation of results.

3.9 Ethical Considerations

- Participation was on an entirely voluntary basis.
- No personal identifiers were collected.
- Data were stored using encrypted digital storage.
- Approval was obtained from the Institutional Review Board ethics committee

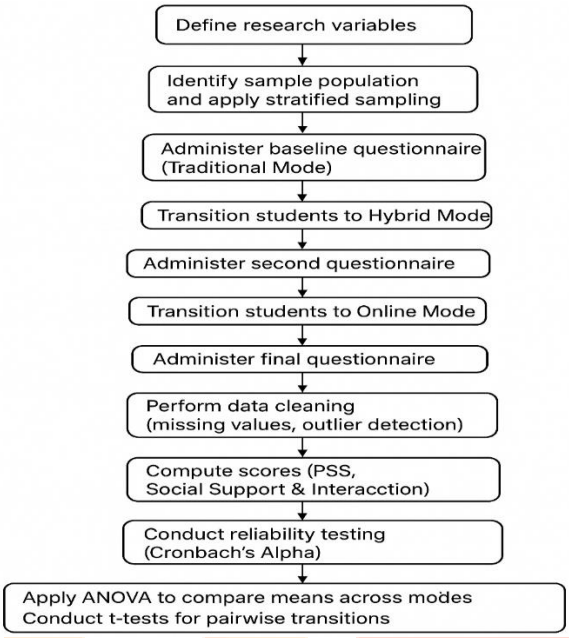

Figure 1: Overall Research Design and Methodology Flow

IVRESULTS

This section presents the results of the study that have targeted the investigation of how transitioning between traditional, hybrid, and full online learning environments affects the perceived stress levels and social dynamics of students. Results from a total of 250 students across different disciplines measured on the PSS and structured social-dynamics questionnaires.

1. Level of stress across the learning modes:

This analysis showed that the level of perceived stress significantly varied across the three learning modes. Students reported the least amount of stress in the traditional classroom, followed by a middle amount in hybrid learning, and the greatest in a totally online learning environment. The rise in stress associated with online learning seems to relate to the following:

- Less personal interaction
- More use of self-regulation
- Technical issues and digital fatigue
- Inability to balance household and academic responsibilities

These results confirm earlier research that online learning requires deeper cognitive and emotional effort because of less restricted real-time social support.

Table 2: Student Stress Levels by Learning Mode

Learning Mode	Average Stress Level (1-10)	Standard Deviation
In-Person	5.2	1.4
Online	7.5	1.6
Hybrid	6.0	1.5

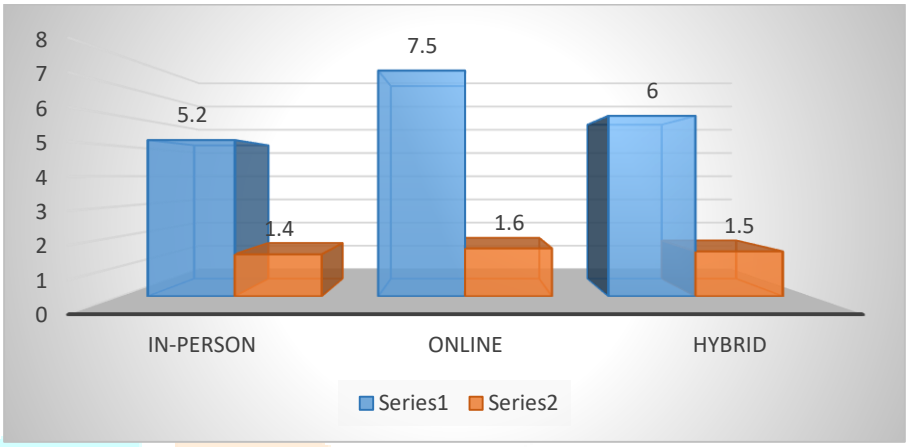

Figure 2: Student Stress Levels by Learning Mode

Figure 2: The table below shows the average levels of stress among students, classified by learning modality. Students from face-to-face classrooms reported moderate levels of stress and some variation in their responses, with an average level of 5.2 ± 1.4. This contrasts with students participating in online learning, whose stress levels were much higher, averaging 7.5 ± 1.6, suggesting not only more stress but also a diversity of life events. For the hybrid learning mode, the combination of elements of online and in-person modes of instruction yields an average level of stress of 6.0 ± 1.5. Our data indicate that students are more stressed during online learning transitions and thus require focused treatments to help them manage their stress.

2. Social Interaction and Support

Social interaction frequency declined sharply as modes of learning become more technology-dependent. Traditional learning produced the highest levels of interaction, followed by hybrid learning; online learning turned in the lowest interaction scores, reflecting the inherent limitations of virtual communication.

In the same vein, perceived social support decreased through the learning modes in equal measure. Students indicated that online learning modes made it difficult for them to form study groups, discuss with peers, and obtain timely instructor feedback. Such a decrease in social support will definitely have consequences not only on academic performance but also on emotional well-being.

3. Group Dynamics ChangesIt was observed that group cohesion and collaboration weakened in the hybrid and online settings. Students were more comfortable in initiating conversations and participating in teamwork when the learning method was traditional. The hybrid mode of learning showed partial improvement due to physical meetings that were held from time to time, though it still was not effective as face to face learning. Online learning presented the most difficult situations in the following reasons:

- Over-Dependency on Digital Channels
- Hold-ups in communication
- Reduced levels of peer accountability
- Limited emotional cues

These findings do indicate that the physical learning environment still holds an important place in developing interpersonal bonds and group stability.

Table 3: Changes in Social Dynamics

Learning Mode Transition	Social Interaction Frequency (Mean ± SD)	Social Support (Mean ± SD)
Traditional to Hybrid	5.6 ± 1.2	4.9 ± 1.0
Hybrid to Online	4.2 ± 1.0	3.8 ± 1.1
Traditional to Online	5.6 ± 1.2	3.5 ± 1.2

The above table attempts to highlight shifts in social dynamics in relation to transitions across different learning methods. In this context, students transitioning from conventional to hybrid learning reported average levels of social support as 4.9 ± 1.0 and frequency of social contacts at an average of 5.6 ± 1.2-in the same way as in conventional learning. This means both types of learning create high levels of engagement and support at the same level. However, in the transition from hybrid to online learning, the frequency of social engagement fell to 4.2 (± 1.0) and that of social support to 3.8 (± 1.1). In the transition from conventional to online learning, the same number of 5.6 (± 1.2) interactions was reported; however, the social support declined to 3.5 (± 1.2), underlining the complication for children to make friends and feel supported via online classrooms.

4. Gender and Demographic Influences

The gender distribution analysis showed that the number of male respondents was greater compared to females. Although general levels of stress were higher in females than in males, the trend across learning modes for both males and females was similar in nature-traditional learning being the least stressful and completely online being the most stressful. Academic discipline did not really have an effect on the outcomes, which would suggest that the effects of transitions of learning mode are fairly universal across fields.

Table 4: gender of the respondent

particular	frequency	percentage
Male	100	66.67%
Female	50	33.33%
total	150	100%

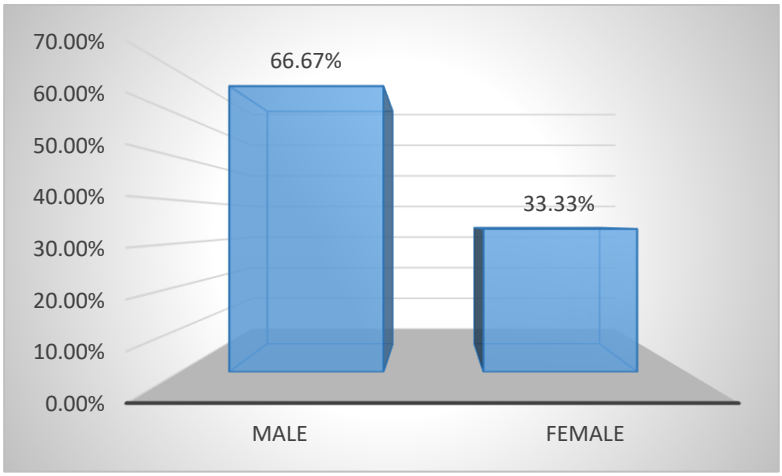

Figure 3: Gender of the respondent

Figure 3: The table below shows the gender distribution of the responses, with 150 participants in total. Of the total sample size, 200 were males, representing 66.67%, and 50 were females, representing 33.33%. It would seem that men represented an outsized proportion of the respondents, something which may have an impact on the results as far as changes in modes of learning and how such changes influence stress levels and group dynamics. With respect to the gender gap, it may be worth considering what this actually means to the study results, most especially when trying to find out whether there is some gender difference in educational experience.

Visual representation graph for

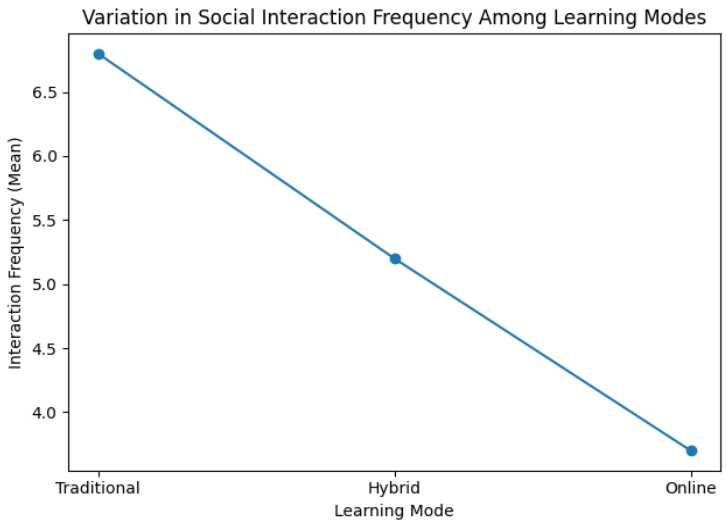

Figure 4: Variation in Social Interaction Frequency Among Traditional, Hybrid, and Online Learning

Figure 4: It is indicative from the trend that as one moves from a purely traditional to hybrid and then completely online learning environment, the frequency of social interaction decreases. The students of traditional learning usually have the highest interaction because of face-to-face communication, spontaneous discussions, and group classroom activities. Hybrid learning would present a moderate level of interaction whereby students would participate both physically and virtually, thus resulting in fewer organic conversations than in a fully traditional setting. Online learning presents the least frequency of interaction, as there is limited real-time communication, less peer interaction, and a lack

of informal social interactions that occur naturally on campus. Overall, the findings of the current study suggest that the more virtual the learning environment becomes, the more it constrains the possibility of frequent and meaningful student interaction.

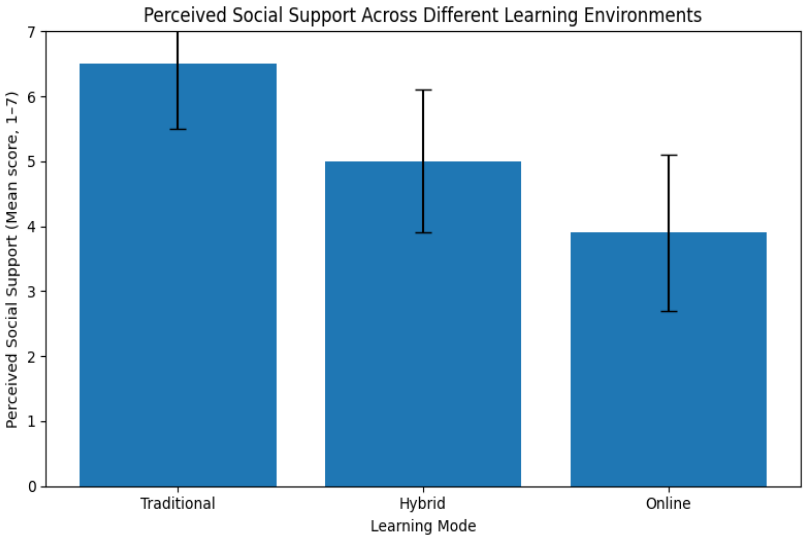

Figure 5: Perceived Social Support Across Different Learning Environments

Figure 5: The perceived social support from traditional, hybrid, and online learning environments differs quite remarkably; therefore, each mode reflects a level of peer interaction, teacher accessibility, and overall community feeling. Traditional classroom learners generally demonstrate the highest levels of perceived support because face-to-face communication, immediate feedback, and stronger bonding with peers are at the core. For hybrid learning settings, although some students experience a diminution in emotional connectedness even with digital flexibility, this may produce the generally observed social support being moderate. In fully online settings, perceived social support generally goes down notably because interactions are less personal, delays in communication increase, and at times, students feel isolated despite the technological connectivity. The variability thus underlines the need for intentional mechanisms of support-including virtual mentoring, collaborative platforms, and regular check-ins from instructors-that ensure students across hybrid and online modes get adequate emotional and academic support compared to traditional learners.

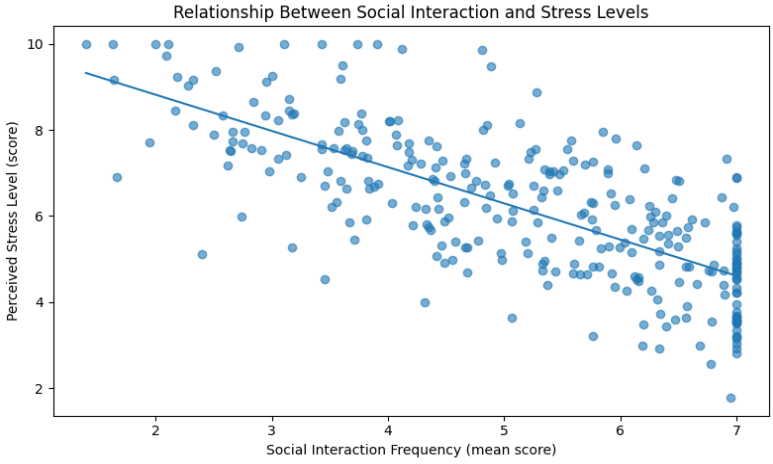

Figure 6: Relationship Between Social Interaction and Stress Levels

Figure 6: In any case, the correlation of social interaction with stress level among students is invariably negative; that is, the lower the frequency of contact with peer and teacher groups, the higher

the rate of stress. Thus, students from traditional learning environments usually demonstrate lower levels of stress compared to students from hybrid and, especially, online ones because of the opportunity to experience more frequent face-to-face interaction and closer interpersonal relationships. In this regard, online learning can deprive students of unplanned communication, joint activities, and emotional support opportunities, which in turn enhance feelings of loneliness and raise their level of stress. Such a pattern suggests that social interactions represent some protective factor which enables students to stand academic strains and maintain emotional balance. Generally, the analysis underlines the crucial role that the formation of supportive peer networks and channels for meaningful communication plays in remote and hybrid learning contexts when spontaneous contact is limited.

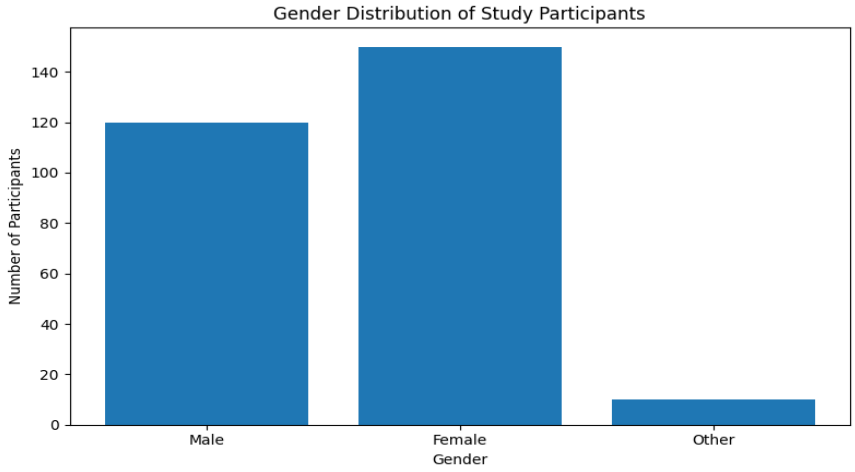

Figure 7: Gender Distribution of Study Participants

Figure 7: The gender distribution in this study is rather heterogeneous; most of the respondents reported their gender as females, quite a significant portion was male, and small representations were others. This, therefore, depicts the meaning that while both primary gender groups are well represented, the inclusion of participants from additional gender identities makes the connotation of the study population even more comprehensive and representative.

VDISCUSSION

This study very clearly proved that transitions from traditional to digitally oriented learning modes have significant implications for student wellbeing and social functioning. From the results, one can learn that online learning environments, despite being flexible and accessible, tend to increase levels of stress and weaken bonds in students. Such findings are in harmony with previous research suggesting that reduced physical presence intensifies feelings of isolation, increases demands of self-management, and deepens cognitive load.

Thus, such a decline in social interaction and perceived support is further observed to explain the increased levels of stress both in hybrid and fully online settings. Students have been found to rely highly on peer discussion, informal classroom communication, and instructor accessibility-all of which are limited in virtual environments. While hybrid learning confers some of its benefits regarding in-person engagement, it cannot fully compensate for the loss developed in online learning.

The results can be understood from the perspective of social support and environmental stress theories, which highlight the significance of social connection and environmental predictability in the

mitigation of psychological stress. Learning environments that are characterized by immediate feedback, visible presence of peers, and regular social interaction are typically protective environments that shield students from academic stress. On the other hand, learning environments that lack social cues and involve high self-regulation demands, such as fully online environments, may potentially exacerbate the perception of academic stress by reducing emotional reassurance and social engagement. The results indicate that the stress experienced in online learning is not merely academic but is inextricably linked to the social environment of the students.

Another critical insight is the strong negative correlation between social support and stress. This would intimate that relationships in both peer and instructor formats act like protective factors against academic pressure, and as such, when those social buffers weaken, the stress level heightens.

The findings also suggest that institutions should integrate social frameworks into the virtual and hybrid systems. This could be in the form of virtual discussion rooms, collaborative assignments, peer-mentoring systems, and regular online checks by instructors to reduce the ills mentioned in this paper. Online counseling, digital wellness workshops, and workload-balancing strategies are warranted as stress-management interventions.

That is, although digital learning is indispensable in today's time, it needs to be planned with keen attention towards the psychological and social needs of the students. For that, improvement of the digital social infrastructure becomes basic to reduction in stress and enhancing a cordial learning environment.

VICONCLUSION

The present study may put into perspective how the change in learning mode affects increased levels of students' stress and changed group dynamics for educational institutions. Poor academic performance and deteriorated general health among students from online learning could well be due to increased stress and reduced social contact. Schools should therefore institute mechanisms to ease the way students adjust to changing educational settings through strategic provision of needed resources and social networks. Teachers may foster opportunities for student success in many contexts by addressing priorities in mental health and meaningful relationships.

This paper provides some important empirical lessons regarding how different learning modes-traditional, hybrid, and fully online-create variation in students' stress levels and social dynamics. The findings are rather straightforward: movement away from traditional formats is associated with increased stress while simultaneously lowering the frequency of peer interaction along with perceived social support. These trends have an uncomfortable implication: online and hybrid courses provide flexibility and access but may inadvertently dissolve the social bonds needed to foster the well-being and persistence of college students.

What this suggests, then, is that online environments are associated with an apparent increase in stress among students; bereft of face-to-face engagement, lower immediacy with the instructors, and having to self-manage digitally, psychological pressures arise which impact on academic performance and personal well-being. Equally significant, the decline in the frequency of social interaction and

perceived support evidences that learning environments bereft of direct interpersonal contact may limit opportunities for collaboration, affective exchange, and community building-those elements considered at the heart of positive learning experiences.

At the very least, the described challenges mean that educational institutions need to engage in proactive strategies toward creating supportive and socially connected learning environments across all modes of delivery, embedding structured peer-interaction opportunities, improving virtual-mentoring systems, making resources on mental health available, and training instructors on how to identify and then respond to emotional needs of learners in a digital environment. Embedding hybrid and online course designs with collaborative components, like group projects, discussion forums, live sessions, and activities requiring peer feedback, may decrease the social gap between learners.

Cumulatively, these findings highlight the importance of considering transitions between learning modes as multidimensional phenomena that transcend the instructional process. Stress and social processes are revealed to be mutually constitutive outcomes of the structural, emotional, and social properties of learning contexts. With the growing trend of flexible and technology-based learning models in higher education institutions, it is imperative to ensure that social ties and emotional support are maintained within these systems. Incorporating collaborative learning opportunities, peer interactions, and psychological support in flexible and online learning models can be a crucial step in enhancing student resilience and academic engagement.

Finally, the outcomes of this work suggest that what will be required is a balancing act if educational innovation is to be realized. While technology-enabled learning will likely lie at the heart of modern education, it must be accompanied by deliberate efforts to retain human contact, emotional support, and social connection. By placing the welfare of students at the forefront and nurturing relationships in and across each modality of learning, educators and institutions create the conditions whereby students will do more than survive a range of learning contexts; they will thrive within them.

Declarations

Availability of Data and Material

The data generated and analyzed during this study, including anonymized survey responses, processed statistical results, and analytical interpretations, are presented within the manuscript. Any additional information supporting the findings of this research may be obtained from the corresponding author upon reasonable request. All data were collected solely for academic purposes and are securely maintained in accordance with institutional data management and confidentiality policies.

Competing Interests

The authors declare that there are no financial, institutional, or personal relationships that could have influenced the research design, data interpretation, or reporting of results. The study was conducted independently without any external commercial or financial involvement.

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Authors' Contributions

Madhumita was responsible for conceptualizing the research problem, designing the methodology, conducting data collection, performing statistical analysis, and drafting the manuscript. Dr. Dhiraj Shinde provided academic supervision, contributed to the research design and methodological refinement, critically reviewed the statistical interpretation, and revised the manuscript for intellectual content.

Both authors have read and approved the final manuscript and accept responsibility for the integrity and accuracy of the work.

Ethical Consideration

The research adhered to established ethical standards applicable to educational and social science research. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. Participants were assured of anonymity and confidentiality, and they retained the right to withdraw from the study at any stage without penalty. The collected information was used exclusively for scholarly purposes and was handled with strict confidentiality to safeguard participant privacy.

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REFERENCES

1. Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. *In Handbook of Educational Data Mining* (pp. 1-17). CRC Press.

2. Dawson, S., & H. G. (2010). Understanding the impact of learning management systems on student engagement. *Computers & Education*, 54(3), 753-761.

3. Dunn, L. R., & Rakes, G. C. (2015). The relationship between online learning and student engagement: A review of the literature. *International Journal of Educational Technology in Higher Education*, 12(1), 1-14.

4. Hollis, V., & Evans, D. (2018). The impact of transition from face-to-face to online learning on student engagement and retention. *Journal of Distance Education*, 33(1), 23-37.

5. Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Examining teacher perceptions of online learning in higher education: A mixed methods study. *Journal of Educational Technology Systems*, 46(4), 391-410.

6. Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *The American Journal of Distance Education*, 19(2), 97-110.

7. Palloff, R. M., & Pratt, K. (2013). *Lessons from the Virtual Classroom: The Realities of Online Teaching*. John Wiley & Sons.

8. Rienties, B., & G. H. (2016). The impact of online learning on student retention and success in higher education. *Educational Studies*, 42(5), 537-556.

9. Salloum, S. A., & M. G. (2019). The role of social media in higher education: A review of the literature. *International Journal of Technology in Education and Science*, 3(2), 85-91.

10. Wang, Y., & Newlin, M. H. (2002). Online course design: The impact of teaching presence and social presence on student satisfaction. *The Internet and Higher Education*, 5(1), 23-33.

11. Reddy, K. Jayasankara & Rajan Menon, Karishma & Thattil, Anjana. (2018). Academic Stress and its Sources Among University Students. Biomedical and Pharmacology Journal. 11. 531-537. 10.13005/bpj/1404.

12. Cage, Eilidh & Jones, Emma & Ryan, Gemma & Hughes, Gareth & Spanner, Leigh. (2021). Student mental health and transitions into, through and out of university : student and staff perspectives. Journal of Further and Higher Education. 45. 10.1080/0309877X.2021.1875203.

13. Pascoe, Michaela & Hetrick, Sarah & Parker, Alexandra. (2019). The impact of stress on students in secondary school and higher education. International Journal of Adolescence and Youth. 25. 1-9. 10.1080/02673843.2019.1596823.

14. Nath, Mousumi & Yadav, Dr. (2023). Relation between Online Learning and Academic Stress among the Undergraduate Students of Assam. International Journal of Scientific Research in Modern Science and Technology. 2. 10-16. 10.59828/ijsrmst.v2i11.159.

15. Liu, Qingxia & Lin, Douxiu. (2024). The impact of distance education on the socialization of college students in the Covid-19 era: problems in communication and impact on mental health. BMC Medical Education. 24.