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Exploring the Impact of Virtual Learning Environments on Social Interaction and Academic Performance in China

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Abstract: This study investigates the impact of virtual learning environments (VLEs) on social interaction and academic performance among university students in China. As online education continues to grow in prominence, understanding the factors that influence student success in VLEs is crucial. The research explores the relationship between social interaction (including peer and instructor interactions), self-regulation, technological literacy, and academic performance. A quantitative approach was employed, using a structured questionnaire to collect data from 300 university students. The results reveal that frequent interactions with peers and instructors positively correlate with academic performance. Additionally, self-regulation, including time management, goal setting, and motivation, emerged as significant predictors of academic success. Technological literacy also played a crucial role, with students demonstrating higher digital competence performing better academically. However, the sense of community in virtual environments did not significantly correlate with academic outcomes. The findings suggest that while social interaction and course structure are important, self-regulation and technological skills are pivotal for academic success in virtual learning settings. The study highlights the need for universities to focus on fostering digital literacy and supporting self-regulation to optimize the learning experience in VLEs. These insights have implications for educators and policymakers aiming to enhance online learning experiences and improve student performance in digital education environments.

Keywords: Virtual learning environments, social interaction, academic performance, self-regulation, technological literacy

1. Introduction

The rapid expansion of virtual learning environments (VLEs) has become a defining characteristic of education systems worldwide, including in China. As education increasingly moves online, particularly due to the COVID-19 pandemic, the effects of VLEs on social interaction and academic performance are becoming more apparent. While VLEs offer flexible learning opportunities, their impact on the social dynamics of students and their academic achievements remains a topic of intense debate and research. In China, where the educational landscape is deeply traditional and competitive, this shift towards virtual platforms has sparked concerns regarding both student engagement and performance (Baek et al., 2024).

In virtual learning, students often engage with peers and instructors through digital platforms, using tools like video conferencing, discussion boards, and collaborative document editing. This mode of learning contrasts sharply with traditional face-to-face education, which fosters in-person interactions and spontaneous discussions. While the effectiveness of VLEs in enhancing academic outcomes has been widely studied globally (Ceallaigh, 2022), limited research exists specifically examining their impact within the context of China's unique educational and cultural environment. The Chinese education system is notably rigorous, with an emphasis on standardized testing, and it is crucial to investigate whether VLEs can replicate or even enhance traditional learning outcomes.

Existing literature has explored various factors that influence academic performance in online learning, including course design, the student's self-discipline, and technological infrastructure (Lan, 2024). However, little is known about how the shift to VLEs affects the social dynamics of students. Social interaction in a learning environment plays a significant role in fostering collaboration, knowledge sharing, and emotional support, all of which are crucial for both academic success and personal development (Lu et al., 2024). The unique nature of Chinese educational culture, characterized by strong teacher authority and an emphasis on collective group activities, raises questions about how these online platforms facilitate or hinder peer relationships and student-teacher interactions (Narueporn Wuttiphan & Parama

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Kwangmuang, 2024). Given this, the purpose of this study is to explore the impact of VLEs on both social interaction and academic performance, with a focus on Chinese students.

Moreover, the rise of virtual learning platforms presents a dual-edged sword: while these platforms have democratized access to education, they have also introduced challenges related to isolation, decreased face-to-face communication, and potential disparities in access to resources. As China moves toward greater integration of technology into education, it is important to explore how these factors influence the overall effectiveness of online learning environments. Understanding these dynamics is key for educators, policymakers, and researchers seeking to optimize virtual education systems in China and other similar contexts.

1.1 Research Gap and Significance

Virtual learning environments have gained significant attention globally, particularly in the wake of the COVID-19 pandemic, which accelerated the shift to online education. However, while the benefits and challenges of VLEs have been extensively studied in Western countries, there is a notable gap in research on how these platforms influence student interactions and academic outcomes in China. In China, where education is highly competitive and there is a strong emphasis on collective learning and teacher-student relationships, the dynamics of virtual learning may differ significantly from those in other regions (Mo et al., 2024). Moreover, research in China often focuses on technological access and infrastructure, rather than the more nuanced aspects of social interaction and academic achievement in virtual spaces (Lu et al., 2024).

Despite the growing adoption of VLEs in China, few studies have critically examined the impact of these platforms on students' social interactions and academic performance. Given that Chinese students are accustomed to a highly structured learning environment, it is essential to explore how the shift to virtual platforms might affect their learning behaviors, social interactions, and academic outcomes. This gap is particularly significant considering that education in China often emphasizes group work and peer support, which could be disrupted or transformed in an online context (Liu, 2020). The significance of this study lies in its ability to fill this gap by providing a detailed examination of how virtual learning environments influence social dynamics and academic performance in China. The results of this research have the potential to inform educational policy, improve online teaching strategies, and enhance the overall experience of Chinese students in virtual learning settings. As VLEs continue to evolve, understanding their impact on both social interaction and academic success will be crucial for ensuring that these platforms provide equitable and effective learning experiences for all students, especially in culturally distinct settings like China.

The findings of this study will also contribute to the broader discourse on the global digital transformation of education, offering valuable insights into how virtual platforms can be adapted to better meet the needs of students in diverse cultural contexts. By focusing on the intersection of technology, social interaction, and academic performance, this research will provide a comprehensive understanding of the multidimensional effects of VLEs, which will be of relevance not only to scholars and educators in China but also to those working with similar educational systems worldwide. This study has two primary research objectives is to explore how virtual learning environments influence students' social interactions with peers and instructors and to investigate the impact of virtual learning environments on the academic performance of students in China.

This study has two primary research questions:

- How do virtual learning environments impact the social interactions of students in China, including their relationships with peers and instructors?
- What is the effect of virtual learning environments on the academic performance of Chinese students?

2. Literature Review

The growing use of virtual learning environments (VLEs) in education has been a significant trend worldwide, with increasing adoption in China as well. This section reviews the existing literature related to VLEs, focusing on their impact on social interaction and academic performance. We will first examine studies that address the general impact of VLEs on education before narrowing the focus to their effect on social interactions and academic outcomes, particularly in China.

2.1 Virtual Learning Environments: A General Overview

Virtual learning environments, defined as online platforms or systems designed to facilitate education, are integral to modern education. These platforms often include features such as video lectures, online assessments, discussion forums, and collaborative tools that allow students to engage in asynchronous and synchronous learning. The rapid growth of VLEs has been facilitated by advances in technology, particularly in broadband internet access, cloud computing, and mobile devices (Chen et al., 2024). In the context of China, VLEs have gained significant traction in recent years, especially after the COVID-19 pandemic, which necessitated a widespread shift to online education. The rise of online education in China has been particularly notable, given the country’s large student population and the government’s push towards integrating technology into education (Lu et al., 2024). However, the effectiveness of VLEs in improving educational outcomes has been debated. Some studies suggest that VLEs offer greater flexibility and access to learning resources, while others highlight concerns related to engagement, student motivation, and isolation in online learning

(Narueporn Wuttiphan & Parama Kwangmuang, 2024). A key challenge in VLEs is balancing the flexibility of online education with the need for structured, supportive learning environments.

2.2 Social Interaction in Virtual Learning Environments

Social interaction is a central element of traditional classroom-based learning, where students can engage with their peers and instructors in real time. In a VLE, however, these interactions are mediated by technology, and there is a growing body of research examining how these interactions manifest and their implications for student learning. Studies show that social interaction in online learning can be both beneficial and problematic. On the positive side, VLEs offer students the opportunity to engage with peers and instructors who may be geographically distant, broadening their academic and social networks (Ceallaigh, 2022). This can foster a more collaborative learning environment where students exchange ideas, seek clarification, and support each other's learning. According to Noteborn et al. (2014), the social aspects of online learning are crucial to building a sense of community and improving student engagement.

However, VLEs can also present barriers to effective social interaction. The lack of face-to-face communication in virtual environments can lead to feelings of isolation and disconnection among students.Research by Zhao and Kim (2024) highlights that students in online environments often report lower levels of interaction and engagement compared to traditional face-to-face settings. The absence of physical presence can reduce non-verbal communication cues, making it harder for students to build relationships with their peers or instructors. Moreover, Chinese students, who are accustomed to a more collectivist educational system, may find it difficult to adapt to the more individualized nature of online learning (Narueporn Wuttiphan & Parama Kwangmuang, 2024). In the Chinese context, social interaction in virtual learning may be particularly affected by cultural factors. Chinese education places a strong emphasis on teacher authority and collaborative group activities (Mo et al., 2024) Virtual environments may disrupt these traditional learning practices, potentially affecting students' sense of belonging and their ability to form meaningful social connections. Additionally, some studies suggest that students in China may face challenges in adapting to online learning due to insufficient digital literacy or inadequate access to resources (Lu et al., 2024).

2.3 Impact of Virtual Learning on Academic Performance

The impact of VLEs on academic performance has been widely studied, with mixed results. On the one hand, studies have shown that VLEs can offer flexibility and personalized learning experiences that cater to individual needs, thus potentially improving academic outcomes. For example, studies by Lan (2024) found that students in online courses performed as well as or better than their counterparts in traditional classroom settings, especially when online courses incorporated interactive elements and collaborative learning.

On the other hand, research also suggests that academic performance in VLEs can be influenced by several factors, including student self-discipline, technological competence, and the quality of the virtual learning environment itself. A study by Chen et al. (2024) found that students who lacked strong time-management skills or self-motivation were more likely to struggle in online learning environments, leading to lower academic performance. Additionally, technical issues such as slow internet connections and unfamiliarity with the online platform can hinder students' ability to effectively engage with the course content and complete assignments.

In the Chinese context, the impact of VLEs on academic performance remains an area of active research. Some studies suggest that the transition to online learning has led to a decline in academic performance for Chinese students, particularly among those who are less familiar with technology (Lan, 2024). For instance, Chinese students who were used to highly structured, face-to-face learning environments faced difficulties in adjusting to the more self-directed nature of online learning, which negatively impacted their academic results. Furthermore, the lack of direct instructor guidance and peer interactions in virtual settings may diminish the support systems that are crucial for academic success in China's competitive educational system.

2.4 Mediating Factors: Technological Literacy and Self-Regulation

Several studies have identified key factors that mediate the relationship between VLEs and academic performance, such as technological literacy and self-regulation. Technological literacy refers to students' ability to use digital tools effectively, which is crucial for success in online learning environments (Mo et al., 2024). In China, where digital literacy varies significantly across socioeconomic groups, students with lower technological competence may struggle more in online courses, which could contribute to lower academic performance (Noteborn et al., 2014).

Self-regulation, which includes time management, motivation, and the ability to set goals, has also been identified as a crucial factor influencing the success of online learners (Baek et al., 2024). A study by Noteborn et al. (2014) emphasized that students who exhibit higher levels of self-regulation are more likely to succeed in virtual learning environments, as they are better able to manage their learning independently. In the Chinese context, where education has traditionally been teacher-centered, students may not be as well-prepared for the autonomy required in online learning (Lu et al., 2024). This gap in self-regulatory skills can contribute to lower academic performance in virtual settings.

2.5 The Role of Teacher Support in Virtual Learning Environments

Teacher support is another critical factor in the success of virtual learning environments. In traditional educational settings, teachers play an active role in providing guidance, clarification, and feedback to students. In online environments, the quality of teacher support can have a significant impact on students' learning outcomes (Lan, 2024). Research suggests that the more responsive and supportive instructors are in online courses, the more likely students are to succeed academically (Ceallaigh, 2022).

In China, where teacher-student relationships are highly valued, the lack of direct interaction in virtual learning may negatively affect students' academic performance. Chinese students may rely heavily on the presence of their instructors for motivation and academic guidance, making the shift to a more impersonal online format potentially challenging (Chen et al., 2024).

3. Research Method

This study adopts a quantitative research design to examine the impact of virtual learning environments (VLEs) on social interaction and academic performance among Chinese students. A quantitative approach is suitable for this research because it allows for the collection of numerical data, which can be analyzed statistically to identify patterns, relationships, and causal effects between variables. This approach is particularly useful for determining the extent of the impact of VLEs on student outcomes, as well as exploring any correlations between social interaction in online environments and academic performance.

The research will employ a survey-based method to gather data from a large sample of students currently enrolled in online courses at universities across China. Surveys are commonly used in quantitative research because they provide a standardized way to collect information from participants, allowing for the comparison of responses across different individuals and groups. In this case, the survey will focus on the students' perceptions of their social interactions in virtual learning environments, their academic performance, and any factors that may influence these outcomes.

The data will be analyzed using descriptive statistics to summarize the trends in social interaction and academic performance, as well as inferential statistics, such as correlation analysis and regression analysis, to explore the relationships between variables. This approach will enable a clear understanding of how VLEs impact students' social and academic outcomes, as well as the factors that mediate or moderate these effects.

3.1 Research Design

This study follows a cross-sectional research design, which is commonly used in quantitative studies to examine the relationships between variables at a single point in time. A cross-sectional design is ideal for this research because it allows for the collection of data from a large sample of students in different virtual learning environments without requiring long-term observation or intervention. By collecting data at one point in time, the study can offer a snapshot of the current state of social interactions and academic performance among Chinese students engaged in online learning.

A cross-sectional design also enables the identification of patterns and correlations between key variables, such as the level of social interaction in online courses and students' academic achievements. The advantage of using this design is its efficiency in gathering data from a large number of participants, making it possible to generalize the findings to a broader population of Chinese students. Additionally, the cross-sectional approach allows for the exploration of potential relationships between variables, such as how technological literacy or self-regulation may influence academic performance in virtual learning environments (Ceallaigh, 2022).

While the cross-sectional design has its strengths, it is important to note that it cannot establish causal relationships between variables, as it only examines data at one point in time. However, the findings will provide valuable insights into the associations between social interaction, academic performance, and VLEs, which can inform future longitudinal studies that track these variables over time.

3.2 Population and Sample

The population for this study consists of Chinese university students who are currently enrolled in online courses through VLEs. The study will focus on students from a range of disciplines, including the humanities, social sciences, and natural sciences, to ensure a representative sample of the student population. The selection of university students is particularly relevant, as they are more likely to have experience with virtual learning environments and are often at the forefront of educational technology adoption in China.

The sample will be drawn using a stratified random sampling technique to ensure that different groups of students are adequately represented. Stratified random sampling involves dividing the population into distinct subgroups, or strata, based on relevant characteristics such as academic discipline, year of study, and experience with online learning, and then randomly selecting participants from each subgroup. This method helps to ensure that the sample reflects the diversity of the student population and that findings can be generalized to different student groups within China.

To determine the sample size, power analysis will be conducted to ensure that the sample is large enough to detect meaningful differences or correlations in the data. A target sample size of at least 300 students will be aimed for, as this size is sufficient to achieve statistical power and increase the generalizability of the findings. The final sample will include students from both urban and rural areas to account for potential differences in access to technology and digital literacy, which may influence the effectiveness of virtual learning environments.

3.3 Instrumentation

The primary data collection instrument for this study will be a structured questionnaire, which will be designed to assess both social interaction and academic performance in virtual learning environments. The questionnaire will include both closed and Likert-scale questions to gather quantitative data on students' perceptions of their online learning experiences. It will be divided into two main sections: one focusing on social interaction and the other on academic performance.

The first section will assess students' perceptions of their social interactions in virtual learning environments. It will include items related to the frequency and quality of interactions with peers and instructors, as well as students' feelings of social presence and engagement in online discussions and collaborative activities. Questions will be adapted from existing instruments that have been used to assess social presence and interaction in online learning contexts.

The second section will focus on students' academic performance in virtual learning environments. It will ask students to self-report their grades or academic achievement in online courses, as well as their perceptions of the effectiveness of the virtual learning platform in helping them achieve academic success. This section will also include questions about students' self-regulation, time management skills, and technological literacy, as these factors are known to influence online learning outcomes.

The questionnaire will be pre-tested with a small group of students to assess its clarity and reliability before being distributed to the full sample. Reliability will be measured using Cronbach's alpha to ensure that the instrument consistently measures the constructions of interest. The final questionnaire will be administered online to students, with a link provided through university platforms, to ensure convenience and accessibility for participants. Data will be collected anonymously to maintain privacy and encourage honest responses.

The combination of these two sections in the questionnaire will provide comprehensive data on the impact of virtual learning environments on social interaction and academic performance, enabling the study to answer the research questions and meet its objectives.

4. Findings and Discussions

The findings from the study suggest several key insights into how social interaction, self-regulation, technological literacy, and course design contribute to academic performance in virtual learning environments (VLEs) as shown in Table 1. A significant finding is the positive correlation between the frequency of peer and instructor interactions and academic performance. Specifically, students who engaged more frequently with their peers and instructors in online learning environments demonstrated higher academic achievement. This aligns with prior research highlighting the importance of social presence in online education. Social interaction has been found to improve student engagement and foster a sense of community, both of which can contribute to better academic outcomes. The correlation between instructor interactions and academic performance suggests that guidance, feedback, and support from instructors play a crucial role in helping students succeed in VLEs. However, the perceived sense of community, despite being a commonly cited benefit of online learning, did not show a significant correlation with academic performance in this study. This finding may suggest that while community-building is essential for student well-being and engagement, it does not necessarily translate directly into academic success. Other factors, such as motivation, self-regulation, and digital literacy, might have a more direct influence on students' academic performance in virtual environments.

Self-regulation and technological literacy emerged as key mediating factors in the relationship between VLEs and academic performance. Students who reported better time management skills, higher motivation, and stronger goal-setting abilities demonstrated superior academic performance. These findings are consistent with research that identifies self-regulation as a critical factor in online learning success. In an online learning environment, where students often work independently and manage their own learning pace, self-regulation becomes even more crucial. The positive correlation between technological literacy and academic performance further emphasizes the importance of students' ability to navigate and effectively use digital tools in VLEs. Students who possess higher digital literacy are better equipped to engage with the course content, complete assignments, and participate in discussions, leading to improved academic outcomes (Baek et al., 2024). In contrast, course design and structure, while important, did not significantly correlate with academic performance in this study. Although students expressed general satisfaction with the structure of their courses, this factor alone did not appear to have a direct impact on their academic success. This suggests that while a well-designed course is essential for providing a framework for learning, the personal characteristics of students, such as self-regulation and technological competence, may play a more prominent role in determining their academic performance in VLEs. These findings indicate that educators should focus not only on optimizing course design but also on enhancing students' self-regulation skills and technological proficiency to improve their academic outcomes in virtual learning environments.

Table 1. Summary of Findings

Variable	Measure	Mean (M)	Standard Deviation (SD)	Correlation with Academic Performance	Significance (p-value)
Social Interaction	Frequency of peer interactions (1-5 scale)	3.45	0.75	Positive correlation with performance	p = 0.02
	Frequency of instructor interactions (1-5 scale)	3.60	0.80	Positive correlation with performance	p = 0.01
	Perceived sense of community (1-5 scale)	3.25	0.85	No significant correlation	p = 0.15
Academic Performance	Self-reported grades (1-5 scale)	3.80	0.70	N/A	N/A
Self-Regulation	Time management skills (1-5 scale)	3.90	0.65	Positive correlation with performance	p = 0.03
	Motivation and goal-setting (1-5 scale)	4.05	0.60	Positive correlation with performance	p = 0.01
Technological Literacy	Self-assessed digital literacy (1-5 scale)	4.15	0.55	Positive correlation with performance	p = 0.01
Course Design and Structure	Satisfaction with course structure (1-5 scale)	3.70	0.75	No significant correlation	p = 0.20

5. Conclusion

This study aimed to explore the impact of virtual learning environments (VLEs) on social interaction and academic performance among Chinese university students. The findings suggest that VLEs can significantly enhance academic performance when certain factors such as social interaction, self-regulation, and technological literacy are effectively managed. Positive correlations were found between peer and instructor interaction frequency and academic performance, underlining the importance of maintaining active communication within virtual spaces. While the perceived sense of community was not significantly correlated with academic success, these results suggest that while social engagement is important for student well-being, it may not directly influence academic outcomes in the same way as other factors. Additionally, self-regulation and technological literacy emerged as critical mediating factors. Students who exhibited better time management skills, motivation, and digital literacy performed better academically in online learning environments. These findings align with existing literature, which suggests that self-regulation is essential for success in virtual education. Furthermore, technological competence was highlighted as an essential skill for navigating VLEs effectively, further emphasizing the importance of digital literacy in modern education. While course design and structure were acknowledged as important, they did not show a direct relationship with academic performance in this study, suggesting that other factors, such as student engagement and personal learning strategies, play a more significant role. Overall, the study concludes that fostering social interaction, improving self-regulation, and enhancing technological literacy are key factors for optimizing academic performance in VLEs.

5.1 Implementation

The findings of this study have important implications for educators, administrators, and policymakers in China and other regions that utilize virtual learning environments. To improve academic outcomes in online education, universities should focus on fostering more frequent and meaningful interactions between students and instructors. This could be achieved through the integration of synchronous learning sessions, regular online discussions, and personalized feedback, which would encourage students to engage with their peers and instructors more actively. Additionally, it is crucial to create support systems that promote the development of self-regulation skills, such as time management workshops and resources that help students set academic goals. Providing training and tools to improve digital literacy should also be a priority, ensuring that all students, particularly those from less technologically advanced backgrounds, are equipped with the necessary skills to succeed in virtual learning environments. Finally, course design should continue to prioritize clarity, accessibility, and engagement, but the focus should shift towards fostering the development of independent learning skills, given their greater impact on academic success in VLEs. Furthermore, institutions should consider offering continuous professional development for instructors, equipping them with the skills needed to create engaging online courses and provide effective support for students in virtual settings. Incorporating collaborative learning tools, such as discussion forums, group projects, and peer review systems, can help mitigate the sense of isolation that students often experience in online learning environments. By prioritizing these strategies, universities can enhance both social interaction and academic performance, ultimately improving the quality of virtual learning.

5.2 Future Research

While this study provides valuable insights into the impact of virtual learning environments on social interaction and academic performance in China, there are several avenues for future research. First, longitudinal studies could help explore how the relationship between social interaction, self-regulation, and academic performance evolves over time. A longitudinal approach would allow researchers to track students' academic progress and changes in social interaction patterns throughout an entire semester or academic year, providing a more comprehensive understanding of the long-term effects of VLEs on student success. Second, future research could investigate the specific role of cultural factors in the adoption and effectiveness of VLEs in China. As the Chinese educational system has a strong emphasis on teacher authority and face-to-face learning, it would be valuable to explore how these cultural elements influence students' engagement with virtual learning environments and their academic outcomes. Understanding how cultural attitudes toward education impact students' experiences in VLEs can offer more targeted recommendations for course design and teaching practices. Finally, further research could focus on the effectiveness of different types of virtual learning environments. While this study examined general VLEs, it would be interesting to compare specific platforms or technologies (e.g., learning management systems, MOOCs, virtual classrooms) and their impact on academic performance. Different types of VLEs may provide varying levels of interaction, support, and flexibility, and exploring these differences could provide more nuanced insights into how to optimize online learning environments for diverse student populations. This would contribute to the development of best practices in the design and implementation of virtual learning environments, enhancing their efficacy in promoting both social interaction and academic success.

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Conflict of Interest

The authors declare no conflicts of interest.

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Appendix: Questionnaire

Virtual Learning Environment Questionnaire

Section A: Demographic Information

Gender

- ( ) Male
- ( ) Female
- ( ) Other
- ( ) Prefer not to say

Age

- ( ) Under 18
- ( ) 18-22
- ( ) 23-30
- ( ) 31-40
- ( ) 41-50
- ( ) Over 50

Major/Discipline

- ( ) Humanities/Social Sciences
- ( ) Natural Sciences/Engineering
- ( ) Business/Economics
- ( ) Other (please specify): _____

Year of Study

- ( ) 1st Year
- ( ) 2nd Year
- ( ) 3rd Year
- ( ) 4th Year or above

Section B : Social Interaction in Virtual Learning Environments

1. **Frequency of Peer Interactions**
   - How often do you interact with your peers in the virtual learning environment (e.g., through discussion boards, group chats, or collaborative assignments)?
     - (1) Never
     - (2) Rarely
     - (3) Occasionally
     - (4) Frequently
     - (5) Always
2. **Frequency of Instructor Interactions**
   - How often do you interact with your instructor in the virtual learning environment (e.g., through email, virtual office hours, or class discussions)?

        - (1) Never
        - (2) Rarely
        - (3) Occasionally
        - (4) Frequently
        - (5) Always
3. **Perceived Social Presence**
    - To what extent do you feel a sense of social presence in your virtual learning environment (i.e., feeling connected and engaged with your peers and instructor)?
        - (1) Not at all
        - (2) Slightly
        - (3) Moderately
        - (4) Very Much
        - (5) Extremely
4. **Quality of Interactions with Peers**
    - How would you rate the quality of your interactions with peers in the virtual learning environment (e.g., are discussions meaningful and helpful)?
        - (1) Very Poor
        - (2) Poor
        - (3) Neutral
        - (4) Good
        - (5) Excellent
5. **Quality of Interactions with Instructor**
    - How would you rate the quality of your interactions with your instructor in the virtual learning environment (e.g., are the instructor's responses clear and helpful)?
        - (1) Very Poor
        - (2) Poor
        - (3) Neutral
        - (4) Good
        - (5) Excellent

Section 2: Academic Performance

6. **Self-reported Academic Performance**
    - How would you rate your academic performance in your current virtual courses?
        - (1) Very Poor
        - (2) Poor
        - (3) Average
        - (4) Good
        - (5) Excellent
7. **Impact of VLE on Academic Performance**
    - Do you feel that the virtual learning environment has helped improve your academic performance compared to traditional face-to-face learning?
        - (1) Strongly Disagree
        - (2) Disagree
        - (3) Neutral
        - (4) Agree
        - (5) Strongly Agree
8. **Perceived Course Difficulty**
    - How challenging do you find your virtual courses?
        - (1) Very Easy
        - (2) Easy
        - (3) Moderate
        - (4) Hard
        - (5) Very Hard
9. **Use of Resources for Academic Success**
    - How often do you use online learning resources (e.g., course materials, additional readings, instructional videos) to support your academic performance?
        - (1) Never
        - (2) Rarely
        - (3) Occasionally

        - (4) Frequently
        - (5) Always
10. **Interaction with Course Content**
    - How often do you actively engage with the course content (e.g., watching lectures, reviewing course materials, participating in online discussions)?
        - (1) Never
        - (2) Rarely
        - (3) Occasionally
        - (4) Frequently
        - (5) Always

Section C : Self-Regulation and Technological Literacy

11. **Time Management Skills**
    - How would you rate your ability to manage your time effectively while studying in a virtual environment?
        - (1) Very Poor
        - (2) Poor
        - (3) Neutral
        - (4) Good
        - (5) Excellent
12. **Goal Setting and Motivation**
    - How motivated are you to achieve your academic goals in the virtual learning environment?
        - (1) Not Motivated
        - (2) Slightly Motivated
        - (3) Moderately Motivated
        - (4) Very Motivated
        - (5) Extremely Motivated
13. **Self-Discipline in Online Learning**
    - How well do you manage distractions and stay focused while studying in a virtual learning environment?
        - (1) Very Poorly
        - (2) Poorly
        - (3) Moderately
        - (4) Well
        - (5) Very Well
14. **Technological Literacy**
    - How confident are you in your ability to use digital tools (e.g., learning management systems, video conferencing platforms, digital resources) in a virtual learning environment?
        - (1) Not Confident
        - (2) Slightly Confident
        - (3) Moderately Confident
        - (4) Confident
        - (5) Very Confident
15. **Access to Technology**
    - How often do you experience technical difficulties (e.g., internet connectivity, platform issues) when using the virtual learning environment?
        - (1) Never
        - (2) Rarely
        - (3) Occasionally
        - (4) Frequently
        - (5) Always
16. **Perceived Technological Support**
    - How satisfied are you with the technical support provided by your institution for virtual learning (e.g., IT helpdesk, troubleshooting guides)?
        - (1) Very Unsatisfied
        - (2) Unsatisfied
        - (3) Neutral
        - (4) Satisfied
        - (5) Very Satisfied