



Managing Student Engagement in a Virtual Learning Environment: A Case Study of Clustered Versus Dispersed Synchronous Virtual Learning

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Abstract: Student engagement is perhaps the most important indicator of quality teaching and learning environment. The responsibility rests squarely on the professor to ensure an active and productive student engagement in every class taught. The unprecedented adoption of virtual learning platform in higher education across the globe is a legacy of COVID-19 pandemic. While most institutions have returned to in-classroom teaching and some are still struggling to bring students fully back on campus after three years of the pandemic, almost all institutions are offering some kind of virtual learning. Enthusiasm for technology sophistication and its application to education often obscures the impact on student engagement. The purpose of this article is to examine the quality of student engagement in a clustered versus dispersed synchronous learning platform using a case study of a class taught at Beijing Wuzi University. The article concludes that clustered synchronous learning platform is by far superior to dispersed synchronous learning platform. Several recommendations are provided including the need for professors to state intentionally and categorically their student engagement plans in their virtual learning course syllabi.

Keywords: environment; virtual; learning; digital; AI

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1. Introduction

Prior to the COVID-19 global pandemic, educational technology experts often lamented educational leaders' lackluster embrace of instructional technology. Reasons behind the technology adoption challenges include the cost, the high cost of technology prohibited institutions struggling financially from enthusiastically embracing technology; anxiety, change often generates anxiety among teachers, especially those whose educational training included very limited exposure to the rapidly developing technology; and fear, the fear that the growing technology sophistication may one day replace educators.

In order to mitigate the spread of COVID-19 pandemic, governments worldwide ordered a stay in place order that forced institutions to adopt virtual learning almost overnight. Suddenly, finance became a secondary issue, partly because of government assistance and partly because the survival of the institution depended on acquiring the necessary technology to operate a virtual learning environment. Similarly, fear and change-induced anxiety became a subordinate concern given the government mandate and the inevitability of campus shutdown. Across the globe, many institutions acquired the necessary technology to operate virtual learning environment.

However, after a year or two of complete experiment with virtual learning and with the pandemic abating, concerns have shifted to the impact of virtual learning environment on the quality of education as indicated by diminished student engagement and overall student development. While in some places, governments ordered an immediate return to in-campus teaching post-pandemic, two realizations became obvious. First, students and professors got used to the convenience offered by a virtual learning environment. The hassle of having to get out of bed, do make-up, and travel to class suddenly became a burden on the part of students and professors. Second, institutions are compelled to put to use the technology already acquired given the huge financial investment committed to technology.

The drive for quality student engagement and physical student interactions and the reluctance to jettison the convenience of virtual learning compelled many institutions to find a compromise in what is now called hybrid education. A hybrid education, which combines both in-classroom and virtual learning platforms, attempts to benefit from the advantages of both platforms. The degree to which benefits are realized depends on concerted efforts made to enhance student engagement.

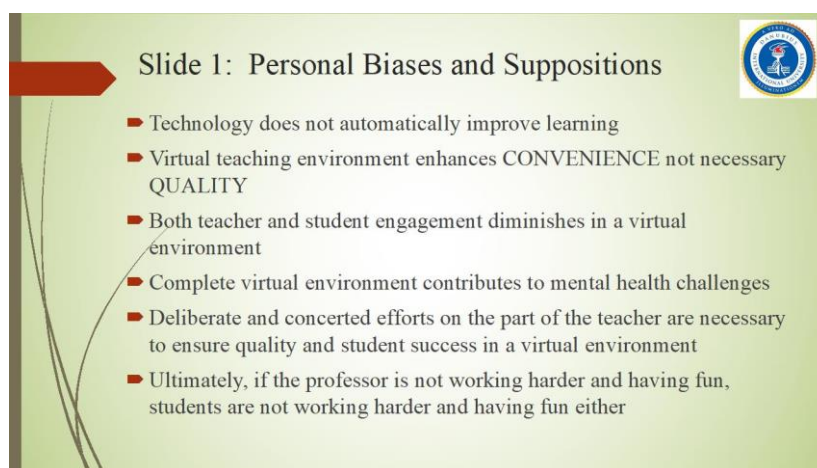
2. Purpose of the Study

In the new world of hybridization, how concerted efforts improve student engagement in virtual learning environment is and must continue to be of interest to educators. Using a case of a class taught virtually, the course professors examine the impact of two types of synchronous platforms: dispersed and clustered. The article concludes with recommendations for improving engagement and student success in a virtual environment.

3. Researcher's Personal Biases

Although the lead author has direct experience in converting a campus from face-to-face to a virtual learning experience and from virtual back to on-campus teaching, and has taught virtual classes for years, thus, has extensive experience with virtual learning pedagogy and appreciation for the benefits of technology sophistication, he is not without personal biases. These biases are as a result of the many years of experience with virtual teaching and learning. It is possible that these biases have influence on the perspectives and observations made in the study.

Slide 1 provides a summary of the suppositions held by the lead author that provide a context for the observations made. While the contributions of technology to the learning environment is undeniable, acquisition of sophisticated technology per se does not automatically result in student growth. Technology provides huge convenience to both teachers and learners, but it takes deliberate efforts to ensure that convenience is not achieved at the expense of quality.



Slide 1: Personal Biases and Suppositions

- Technology does not automatically improve learning
- Virtual teaching environment enhances CONVENIENCE not necessary QUALITY
- Both teacher and student engagement diminishes in a virtual environment
- Complete virtual environment contributes to mental health challenges
- Deliberate and concerted efforts on the part of the teacher are necessary to ensure quality and student success in a virtual environment
- Ultimately, if the professor is not working harder and having fun, students are not working harder and having fun either

It is the belief of these authors that virtual learning environment is not superior to in-class environment with respect to student engagement. These authors believe that the primary purpose of virtual learning was not to enhance instructional quality but to provide convenience to learners. Emerging literature suggests increasing mental health challenges among youths, a situation attributable to virtual isolation lifestyle, is a significant unintentional outcome of living and learning in a virtual environment. The success of teaching and learning in a virtual environment depends very much on teacher's skills, efforts, experience, and passion for student growth. Ultimately, students tend to put in so much work as they perceive their teachers put in. The harder a professor works, the harder their students do, and the more fun a professor has teaching a class, the more fun their students experience also. The lead professor discussed these beliefs with the teaching assistant at the beginning of the course planning.

4. Background

Coursera, a leading online educational provider, defines virtual learning as “an environment where students study a **digital-based curriculum** taught by instructors that lecture **online via video or audio**.¹” The company went further to identify three types of the environment Asynchronous virtual learning:

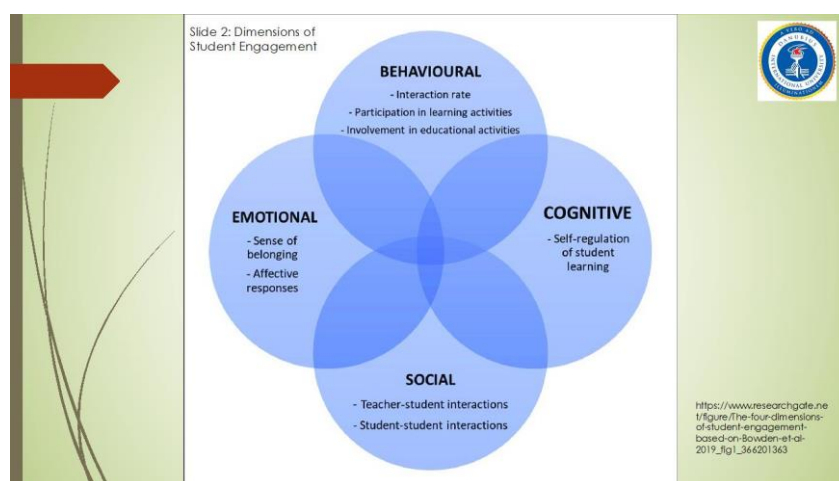
“features pre-recorded lectures that students can **watch on their own time**. The instructor will post either a video or audio file along with lecture notes. Often there will be a quiz on the material to ensure students are watching lectures and up to date with the class schedule. Typically, the instructor or an assistant is available via email or text chat.¹” Synchronous virtual learning “typically asks students to attend online live-streamed lectures. The instructor streams their presentation or lecture, allowing students to ask questions in **real-time** via webcam, microphone, or live chat, for a more hands-on learning experience.¹”

The third format, the hybrid format, combines both virtual and in-person opportunities for learning.

5. Student Engagement

In her article on virtual learning, Alyson Kline noted that virtual learning is here to stay, but there is still much to do to improve student engagement. Quoting Lockhart, Kline stated that “good virtual teaching lies where good teaching is, which is it has to have engagement.”²

Bowden, Tickle & Naumann (2019)³ identified writers that linked student engagement to different aspects of student success:



Student engagement has been linked to an array of traditional success factors such as increased retention (Khademi Ashkzari, Piryaee & Kamelifar, Citation, 2018); high impact and lifelong learning (Artess, Mellors-Bourne & Hooley, Citation, 2017); curricular relevance (Trowler, Citation, 2010); enhanced institutional reputation (Kuh et al., Citation, 2006); increased citizenship behaviours (Zepke, Leach & Butler, Citation, 2014); student perseverance (Khademi Ashkzari, Piryaee & Kamelifar, Citation, 2018); and work-readiness (Krause & Coates, Citation, 2008). It has also been linked to more subjective and holistic outcomes for students themselves including; social and personal growth and development (Zwart Citation, 2009); transformative learning (Kahu Citation 2013); enhanced pride, inclusiveness and belonging (Wentzel Citation, 2012); student wellbeing (Field Citation, 2009).

Based on Bowden, Tickle & Naumann’s work, Martinez and Appel (2022)⁴ provided an illustration of the different dimensions of student engagement (see Slide 2).

6. The Case for Artificial Intelligence (AI) in Education

The development of ChatGPT and AI has led to passionate debates among educators as number of plagiarized and computer-generated works are used by some students in their assignments. While AI may produce original works, they are not authentic works of students. Presenting computer-generated work, it is argued, cannot be graded as if it is student's authentic work and some would go as far as penalizing students for turning in such works to their teachers. What then should educators do?

It is our position that AI should neither be discouraged nor policed. Increasingly, most of student writings are reviewed, revised, and improved by technology so much so it is almost impossible to judge student true writing skills. Computer assists writing by automatic spell checking, correction of grammatical errors, suggesting style modification, and of recent, generating and providing complete write-up on any topic of interest. While there are technology software packages that attempt to determine the degree to which a material is computer generated or plagiarized, it is becoming increasingly difficult to assess the degree to which a particular assignment is computer or technology assisted. Therefore, it is reasonable for teachers to assume that students are taking advantage of technology at their disposal to complete their assignments. For this class, we preempted students by showing and using AI generated materials and building upon this to indicate the value that a teacher adds to what is publicly available to them.

As an example for this paper, we asked ChatGPT two questions: What are the strategies for improving student engagement? The second question was about comparison of student engagement in virtual versus in-classroom environment. The materials generated by AI are presented on Slides 3—6.

Indeed, the materials generated by ChatGPT are reasonably good and teachers cannot pretend that students will comply with their instruction not to use this technology. What is important is what to do with the materials generated by AI and how, as said earlier, to build on what students have access to using their phones or laptops.

Slide 3: ChatGPT's Student Engagement's Strategies



1. Interactive Content

- ❑ **Multimedia Elements:** Incorporate videos, animations, and interactive simulations to make learning more dynamic.
- ❑ **Quizzes and Polls:** Use frequent quizzes and polls to keep students engaged and assess their understanding.

2. Synchronous and Asynchronous Learning

- ❑ **Live Sessions:** Conduct live classes to facilitate real-time interaction between students and instructors.
- ❑ **Discussion Boards:** Provide platforms for asynchronous discussions where students can engage with peers and instructors at their own pace.

3. Personalized Learning

- ❑ **Adaptive Learning Platforms:** Use technology that adapts content to the individual learner's pace and style.
- ❑ **Feedback Mechanisms:** Provide timely and personalized feedback to keep students on track and motivated.

4. Collaborative Activities

- ❑ **Group Projects:** Encourage teamwork through virtual group projects.
- ❑ **Peer Review:** Implement peer review systems to foster a sense of community and collaborative learning.

5. Gamification

- ❑ **Badges and Rewards:** Introduce gamified elements like badges, leaderboards, and rewards to motivate students.
- ❑ **Challenges:** Create challenges and competitions to increase engagement and a sense of accomplishment.

6. Accessibility and Inclusivity

- ❑ **Accessible Content:** Ensure all materials are accessible to students with disabilities.
- ❑ **Diverse Resources:** Provide diverse resources that cater to various learning preferences and cultural backgrounds.

Slide 4: ChatGPT's Student Engagement's Strategies



7. Technology Tools

- ❑ **Learning Management Systems (LMS):** Utilize LMS to organize and deliver content, track progress, and facilitate communication.
- ❑ **Communication Tools:** Use tools like forums, chats, and video conferencing to maintain open lines of communication.

8. Instructor Presence

- ❑ **Active Participation:** Instructors should be actively involved in discussions, provide guidance, and be available for questions.
- ❑ **Office Hours:** Offer virtual office hours for one-on-one support.


9. Engaging Assessments

- ❑ **Project-Based Assessments:** Move beyond traditional tests to project-based assessments that require critical thinking and application of knowledge.
- ❑ **Interactive Assignments:** Use assignments that require interaction with content, such as simulations or virtual labs.

10. Well-being and Motivation


- ❑ **Mental Health Support:** Provide resources and support for mental health.
- ❑ **Encouragement and Recognition:** Regularly recognize and celebrate student achievements to boost morale and motivation.

Slide 5: ChatGPT's Student Engagement's Comparison



- 1. Interaction and Communication**
 - **Online Learning:**
 - **Advantages:** Flexibility in communication (forums, chats, emails), opportunities for introverted students to participate more actively.
 - **Challenges:** Lack of immediate feedback, potential for miscommunication, feeling of isolation.
 - **In-Classroom Learning:**
 - **Advantages:** Immediate feedback, face-to-face interactions, non-verbal communication cues.
 - **Challenges:** Limited participation opportunities for all students, potential for dominant voices to overshadow quieter students.
- 2. Engagement Techniques**
 - **Online Learning:**
 - **Interactive Content:** Multimedia, quizzes, polls, gamification.
 - **Collaborative Tools:** Virtual group projects, peer reviews, discussion boards.
 - **Personalized Learning:** Adaptive platforms, personalized feedback.
 - **In-Classroom Learning:**
 - **Interactive Activities:** Hands-on projects, real-time discussions, group work.
 - **Direct Supervision:** Immediate guidance and correction from instructors.
 - **Physical Engagement:** Use of physical resources and space for activities.
- 3. Flexibility and Accessibility**
 - **Online Learning:**
 - **Advantages:** Access to learning materials anytime, anywhere; self-paced learning; accommodating different learning styles.
 - **Challenges:** Requires reliable internet access and self-discipline; varying degrees of tech-savviness.
 - **In-Classroom Learning:**
 - **Advantages:** Structured schedule, consistent physical learning environment.
 - **Challenges:** Less flexible in scheduling; not always accommodating different learning speeds.
- 4. Assessment Methods**
 - **Online Learning:**
 - **Types of Assessments:** Online quizzes, assignments, project-based assessments.
 - **Advantages:** Automated grading, diverse assessment types, potential for continuous assessment.
 - **Challenges:** Ensuring academic integrity, potential for technical issues.
 - **In-Classroom Learning:**
 - **Types of Assessments:** Written exams, oral presentations, practical demonstrations.
 - **Advantages:** Controlled environment, immediate proctoring.
 - **Challenges:** Limited to scheduled times, potential for higher anxiety.

Slide 6: ChatGPT's Student Engagement's Comparison



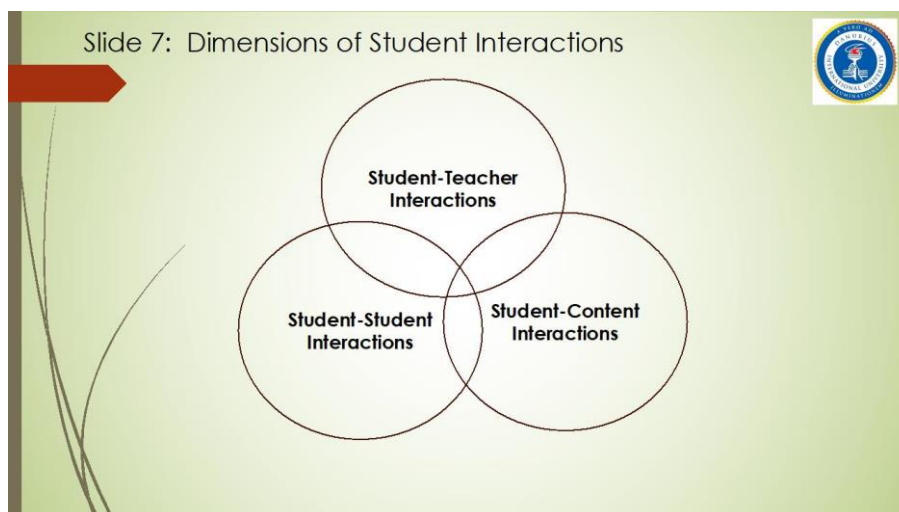
- 5. Student Engagement and Motivation**
 - **Online Learning:**
 - **Motivational Strategies:** Gamification, badges, self-paced learning achievements.
 - **Engagement Metrics:** Participation in forums, quiz completions, time spent on learning modules.
 - **Challenges:** Maintaining consistent motivation, combating feelings of isolation.
 - **In-Classroom Learning:**
 - **Motivational Strategies:** Immediate feedback, face-to-face encouragement, interactive activities.
 - **Engagement Metrics:** Class participation, attendance, in-class activities.
 - **Challenges:** Keeping all students equally engaged, dealing with classroom distractions.
 - **Physical Engagement:** Use of physical resources and space for activities.
- 6. Social Interaction and Community Building**
 - **Online Learning:**
 - **Advantages:** Opportunities for global collaboration, diverse perspectives.
 - **Challenges:** Building a sense of community, limited social interactions.
 - **In-Classroom Learning:**
 - **Advantages:** Stronger sense of community, spontaneous interactions.
 - **Challenges:** Limited to local perspectives, potential for cliques or exclusion.
- 7. Technology and Resources**
 - **Online Learning:**
 - **Resources:** Access to a wide range of digital resources, e-books, online libraries.
 - **Technology:** Dependence on reliable technology, varying levels of digital literacy.
 - **In-Classroom Learning:**
 - **Resources:** Physical textbooks, lab equipment, classroom tools.
 - **Technology:** Limited to classroom technology, less emphasis on digital literacy.
 - **Challenges:** Limited to scheduled times, potential for higher anxiety.

Clama's study⁵ of the impact of multiuser virtual environments on student engagement indicated that engagement scores were significantly higher for the

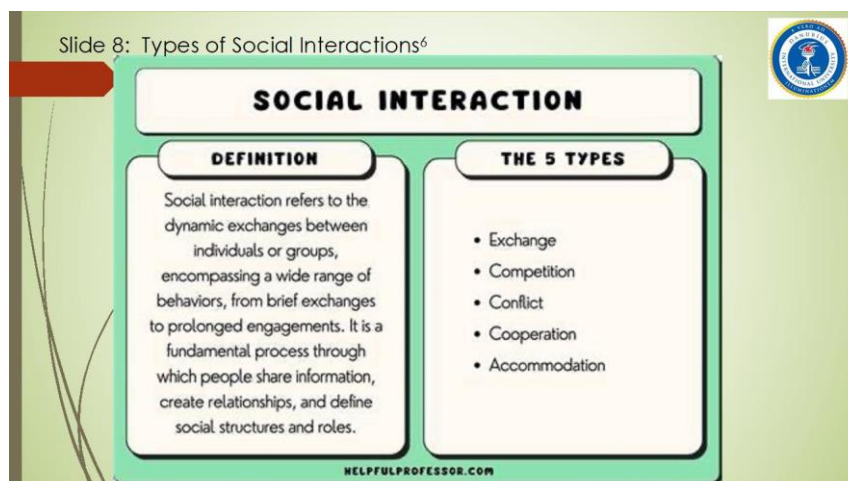
synchronous learning platform compared to asynchronous learning platform among nursing students. This is to be expected because teacher's interactions with students are higher with synchronous teaching than asynchronous teaching, and the opportunity to interact promptly with students in a synchronous learning environment is also greater than asynchronous learning environment.

7. Dimensions of Engagement

Slide 7 illustrates the dimensions of interactions that are important to student engagement.



The quality and frequency of teacher-student interactions reveal the level of communication between them. Typical communications include feedback from students, questions from students seeking clarifications as well as probing questions from teachers to students. Student to student interactions is equally of importance. Typical interactions include collaborative conversations, project planning discussion, and student seeking help from their colleagues. In terms of student-content interactions, students using their technology to do research on topics discussed in class, seeking materials for their assignments, and consulting with textbooks are typical examples.



Slide 8 captures different types of social interactions that are also applicable to student classroom interactions. In healthy class interactions, student exchange ideas and materials, they compete in answering questions, engage in constructive debate among themselves, cooperate and collaborate, and resolve differences of opinions among themselves. All these types of social interactions should be expected in a learning environment with high student engagement.

8. The Case Study

The course under consideration (Introduction to International Business Practices) took place in the summer of 2024 at Beijing Wuzi University, China. Beijing Wuzi University (BWU) was established in 1980. The University is located in the eastern part of Beijing city. It is a small size institution by China's standard with about 8000 students. The University is a comprehensive institution with 10 major academic units: School of Economics, School of Business, School of Logistics, School of Law, School of Accountancy, School of Information, School of Statistics and Data Science, School of Futures, School of Foreign Languages and Cultures, and School of Marxism.

The class that is the subject of this case study was a large size even by China's standard with 74 students. The students were sophomore with a major in Business English. All the students lived on campus. The ratio of boys to girls was small, 21 to 53. Most of the students' English language proficiency was high enough to learn and participate in a class taught in English.

A Teaching Assistant, a regular member of faculty with 19 years of teaching experience at BWU with the rank of associate professor was assigned to the class. Her role was critical in ensuring direct classroom management, assisting with language interpretation, and ensuring that the class complies with teaching policy and protocols of Beijing Wuzi University.

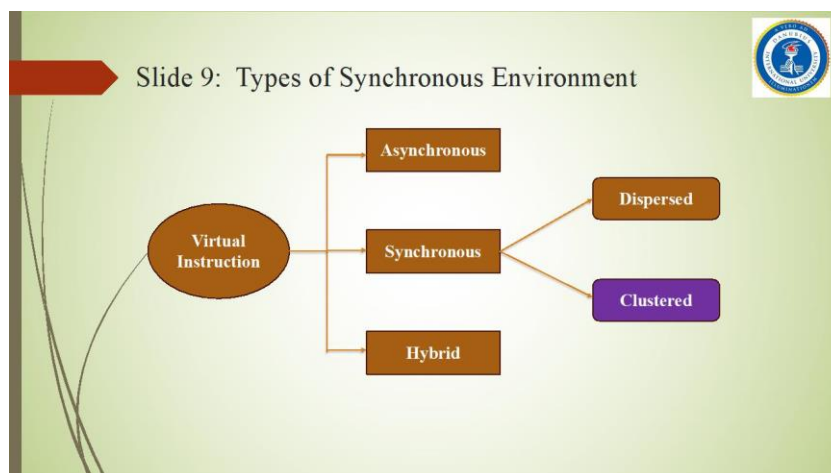
9. Course Planning

The title of the course is *The Introduction to International Business Management Practices*. Although the course is an introductory one, it assumes prior rudimentary knowledge of business practices and economic theories. As a sophomore course, the expectation includes exposure to theories and application of theories to real life situation.

Both the lead professor and the teaching assistant held several planning meetings before the first day in class. The first set of meetings were devoted to content that must be covered. The second set of meetings centered on student engagement, the third on assessment, and the fourth on classroom management.

With the lead professor in Romania and students and teaching assistant in China, we agreed on a synchronous distance learning approach. From the beginning, we planned to use the clustered synchronous for the most part of the class meetings and dispersed synchronous for at least once so as to have basis for comparison. The Clustered or in-classroom Synchronous Virtual Learning has added advantages. It allows students to take instructions from professors from anywhere in the world where there is good connectivity. Student education is no longer limited to their college professors. This arrangement also provides an opportunity for a junior resident professor to co-teach with a non-resident senior professor. Also, resident professors can continue to teach their classes when traveling out of the region.

As indicated earlier, a synchronous virtual learning provides opportunity for real time teaching. The two types of synchronous arrangements are illustrated on Slide 9.



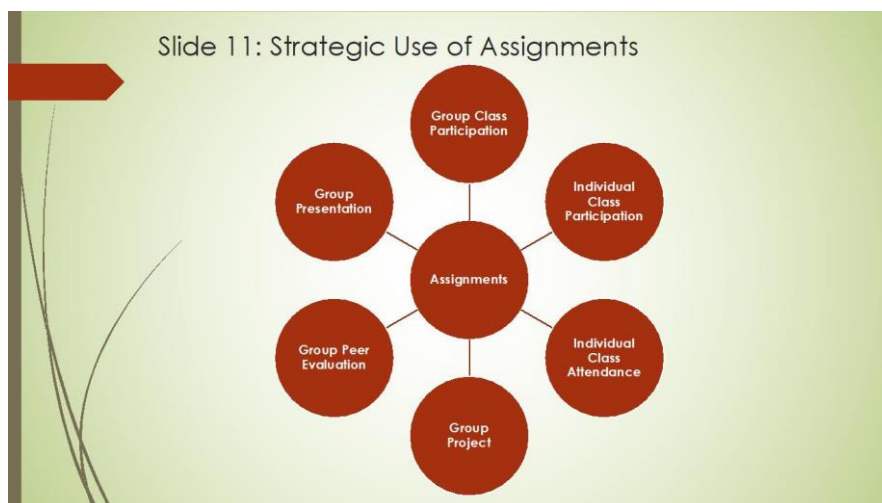
The most common one is what we hereby called Dispersed Synchronous Virtual Learning (DSVL). The second type of synchronous virtual learning is Clustered or in-classroom Virtual Learning (CSVL). The dispersed synchronous learning provides opportunities to connect to a common platform from students' individual homes or stations. Typically, each student can see other students and the professor on their screens. Students are able to interact either by asking questions or sending a text message through the message box. There are several platforms made popular during the pandemic, but a very common one is ZOOM. The Chinese use VooV that functions similarly as Zoom. The Clustered Synchronous Virtual Learning provides opportunity for students to assemble in their class while the professor is remote. In this case study, both DSVL and CSVL were utilized in order to observe which of the two provided higher student engagement.



Group Utilization

Given the size of the class (74 students), we decided to divide the class into 7 groups with either 10 or 11 students in a group. To add fun to the exercise, each group were named after an animal (see Slide 10). Encouraging students to exhibit an interesting trait of their name brings fun and laughter to the class. Deliberate efforts to inject fun brightens class atmosphere as indicated by laughter and smiles on the faces of students.

10. Use of Assignments to Generate Student Engagement



Knowing that students tend to respond to activities associated with their final grades, we were intentional in the use of assignments to generate individual and group engagement. Each group had several opportunities to win points for the group and individuals had opportunities to win points for themselves. As shown on Slide 11, six activities contributed to the final grade. A member of a group who answered questions, provided comments or suggestions in class won points for her/his group and also for her/himself.



This arrangement injected intergroup competition. The group peer evaluation encouraged each member of the group to contribute knowing that their peers would provide evaluation at the end of the class. Group projects required research activities which brought group members together after class. The peer evaluation provided incentive for individual students to contribute. The class presentation for the most part was distributed among members to ensure each student receives a point. Overall, the use of assignments to induce engagement was a success. Slides 12 and 13 show students actively engaged with the professor and with each other.



12. Dispersed Versus Clustered Synchronous

In order to assess student engagement, at least one of the classes was held using dispersed synchronous virtual learning while most of the class days were held using clustered synchronous virtual learning approach. Slides 14 and 15 provide the contrast between engaged and less engaged virtual participation. Slide 14 shows participants with cameras turned on and happy faces. It is easy to assume that Slide 14 indicates a more engaged audience than Slide 15.



As indicated by our experience teaching this class, when the class format was changed from clustered to dispersed, the students exhibited participation captured in slide 15. Over 90% of the students did not turn on their cameras. The level of student-

professor interactions declined dramatically, and student-student interactions were non-existent. In spite of the encouragement to turn on their cameras, most of the students did not heed the advice. Students did not ask questions as they did when CSVL was utilized.

13. Summary of Levels of Interactions

Slide 16: Comparative Analysis of Synchronous Dispersed and Clustered Approach

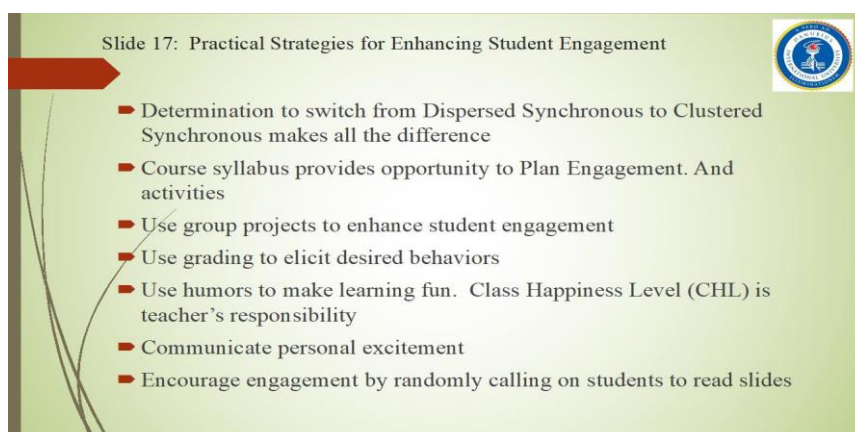
	Dispersed	Clustered
Attendance	Low	Very High
S-T-I	Low	Very High
S-S-I	Low	Very High
S-C-I	Moderate	High
Overall Engagement	Moderate	Very High

Slide 16 provides a summary of the level of interactions and engagement observed between dispersed and clustered, in-class synchronous virtual learning environments. Attendance was easy to observe with the Clustered Synchronous Virtual Learning (CSVL) because each student had to sign in. However, with Dispersed Synchronous Virtual Learning (DSVL), just because a student logged in does not mean that the student was actually present and engaged with the class. Observations made during this class, Student-Teacher Interactions (STI) were low with the Dispersed Synchronous Virtual Learning (DSVL), but very high with the Clustered Synchronous Virtual Learning (CSVL) platform. Students do not readily volunteer to answer teacher's questions when their cameras were not turned on with the DSVL platform. Whereas with CSVL platform, teacher could call on students directly to respond. Student-Student Interactions (SSI) were low, in fact for the most part non-existent with the DSVL platform. Given the fact that students were not together and the fact that their cameras were not turned on, opportunities for them to interact and the desire to interact among themselves were very low. As indicated on some of the slides above, Student to Student Interactions (SSI) were very high when in the CSVL environment (See Slides 14 & 15). The level of Student-Content-

Interactions was higher with the Clustered Synchronous Virtual Learning (CSVL) than Dispersed Synchronous Virtual Learning (DSVL). Overall student engagement was only moderate with DSVL as opposed to CSVL, which was very high.

14. Strategies Utilized to Enhance Student Engagement

Clustered Synchronous Virtual Learning per se would not result in a high-level student engagement.



Slide 17 provides a summary of several strategies utilized that had positive impact on student engagement. At the beginning stage of the course, decision was made to conduct almost all the classes in CSVL format. Making the decision at the beginning provided opportunity to reflect about what it would take to ensure student engagement. Student engagement must be part of the plan during syllabus construction. Group projects have positive impact on student engagement in and out of the classroom. Grading system was used effectively to elicit required behaviors, which were student to student, student to teacher, and student-content interactions. Injecting humor and raising the Happiness Level reduced classroom stress and encouraged students to participate in a lively exchange with the professors. In addition, professor's excitement, passion for student growth, love of the content are contagious and students responded positively to these emotions. Lastly, student engagement was enhanced significantly by the strategy of randomly calling on students to read slides and the use of class applauds to reward them for their participation.

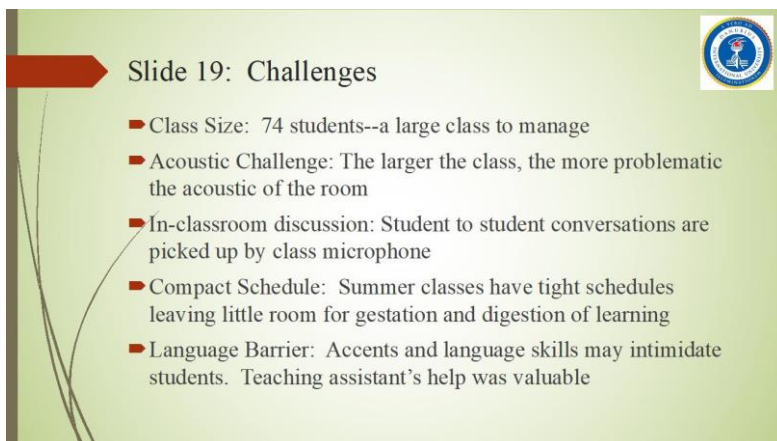


The overall impact of the combination of these strategies on student engagement is palpable as revealed on Slide 18. Students demonstrated their excitement not only by their applause in class, by their eagerness to attend class, but also by their enthusiastic presentations of their work.

Rarely do students give thumbs up in classes especially by Chinese students that, compared to American students, tend to be quieter and decorum-centric in class.

15. Clustered Synchronous Virtual Learning Challenges

The Clustered Synchronous Virtual Learning has its own challenges. First, the larger the class, the more difficult it is to manage remotely. Fortunately, this course had a teaching assistant who was present at every class. Second, a very large class requires a large room. The bigger the room, the more likely there will be an acoustic challenge. Sounds were bouncing off the wall and it made it difficult for the professor in a remote site to hear clearly what the students were saying.

A presentation slide with a light green background and a dark green arrow pointing right at the top left. The title "Slide 19: Challenges" is in the top center. A circular logo is in the top right. A list of five challenges is in the center, each preceded by a red square bullet point. The slide has a decorative line on the left side.

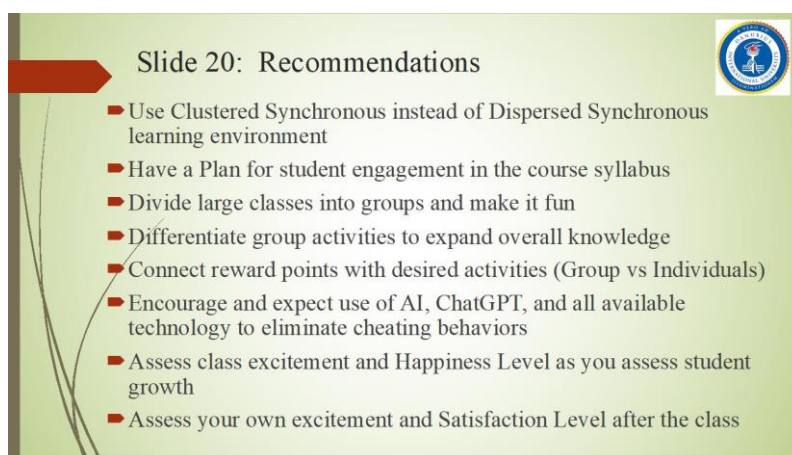
Slide 19: Challenges

- Class Size: 74 students--a large class to manage
- Acoustic Challenge: The larger the class, the more problematic the acoustic of the room
- In-classroom discussion: Student to student conversations are picked up by class microphone
- Compact Schedule: Summer classes have tight schedules leaving little room for gestation and digestion of learning
- Language Barrier: Accents and language skills may intimidate students. Teaching assistant's help was valuable

Third, the microphone picked up private conversations among students. The CSVL has an advantage over DSVL in that it allows students to collaborate and discuss among themselves; hence its high S-S-I. At the same time, the professor at a remote site found it difficult to hear specific student who was answering the professor's question because of the background noise. Both the teaching assistant and the professor decided to use additional device to remedy the situation. We offered the teaching assistant's phone to student who was trying to talk to the professor and with the use of WeChat, the student was able to speak clearly for the professor at the remote site to understand. Fourth, the class presented in this case study was taught over the summertime. Summer courses are taught daily and with that tight schedule, so much information was thrown at students leaving little room for personal reflection. Assignments required quick turnaround and the burden on students was heavier. More reason for the professor to ensure that the class was lively, engaging, and productive. Fifth, teaching Chinese students using English language has its own challenges. In spite of the efforts of the students, the teaching assistant had to step in to help with interpretations on several occasions. Fortunately, the students were hardworking, enthusiastic about their learning, and cooperative with the class requirements. The time difference between Romania and China presented a challenge for the professor who had to get up to teach daily at 2am.

16. Recommendations

Our experience with the course presented in this case study yielded some useful recommendations for those who may plan to teach remotely. Slide 20 provides the summary of the recommendations that should be helpful for virtual teaching:



- First, use Clustered Synchronous Virtual Learning format instead of the Dispersed if possible. It has superior advantage over Dispersed Synchronous Virtual Learning format in terms of student engagement;
- Second, for the class to be successful, the professor has to be intentional and strategic from the beginning about student engagement. The course planning should clearly state how engagement will occur. Meticulous planning helped in anticipating challenges ahead of the class;
- Third, the larger the class, the more appropriate it is to divide class into groups. This strategy created inter-group competition that contributed to engagement;
- Fourth, differentiate group assignments and activities so each group can contribute something unique to the overall knowledge gained in the class. For this course, each group selected a different country for their research. At the end of the course, 7 different countries were covered by all students;
- Fifth, use reward to enhance engagement. Beyond instant verbal rewards and the use of class applause, the grading systems can be used strategically to elicit desired classroom behaviors;
- Sixth, do not police students from using AI or ChatGPT or technology at their disposal during their learning. Instead, encourage them to use what is publicly

available to them. Emphasis on technology induced plagiarism is overblown and unwarranted. Professors should anticipate students would use GPS for navigation instead of reading a map, use of calculator instead of manually multiplying, use spell checkers instead of using a dictionary, etc. However, it is the responsibility of the professor to know what is publicly available and preempt the students by incorporating them into class activities;

- Seventh, each class has its own stress level or, on the contrary, what we call Class Happiness Level (CHL), which is the degree of liveliness and enthusiasm exhibited in class. Seldom do professors think in terms of CHL, but what makes students to give a thump's up at the end of a class is not only because of the amount of materials covered, but by how the professor manages the class. Learning doesn't have to be boring always and teaching doesn't have to be dull and tepid. Every difficult concept can be simplified. Students seek excitement and they do respond to professor's jokes and laughter. Be funny, there is a reason why comedy halls are packed full of audiences all over the world;
- Finally, professors can only give what they have. A boring individual cannot expect a happy class. At the end of every course taught, professors should not only assess student growth, they should also ponder over their own growth, satisfaction, and happiness with the class.

17. Conclusion

Indeed, technology will continue to play increasing critical roles in education. Virtual teaching and learning will continue to grow in popularity as technology becomes more sophisticated. Hybridization is the future of education. With the increasing application of technology, educators' concern for instructional quality will continue to grow. Greater attention will focus on student engagement. Those who wish to enhance student engagement in a virtual world will find the Clustered Synchronous Virtual Learning superior to the Dispersed Synchronous Virtual Learning in generating student engagement. Strategies offered in this article will be helpful to those who wish to teach in a clustered synchronous virtual learning environment.

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