

INFORMATION TECHNOLOGY SESSION

DIGITAL INNOVATION: A PILOT IN TRANSNATIONAL HYBRID TEACHING

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Abstract:

Information technology innovation has the potential to tackle global challenges from climate change to inequality. This research examines a teaching model using HyFlex (Hybrid flexible) technology to connect university classrooms in the UK and India, providing affordable access to higher education without international travel and related emissions. Hyflex systems can enable online and on-campus academics to teach students in different locations. Data gathered shows the pedagogical benefits of this approach. Participating in transnational HyFlex courses has the potential to enhance students' adaptability, digital literacy, and cross-cultural communication skills, all valued skills in the jobs market and academia. Our survey results and pilot findings identify several key considerations for sustainable transnational HyFlex learning, including dedicated IT support, higher-quality equipment, flexible class timing and additional training. Beyond connecting international classrooms, our research suggests this HyFlex model could be readily adapted for diverse applications, including multi-site academic conferences and collaborative research projects spanning multiple institutions and underserved communities.

Keywords:

HyFlex, Hybrid, Innovation, IT, Pedagogy.

INTRODUCTION

Hybrid flexible (HyFlex) learning allows students to attend sessions in person or online in real-time. The HyFlex model provides the flexibility for students to choose their mode of attendance according to their needs, and it supports inclusion and accessibility by adapting to various learning styles and situations [1]. This research relates to HyFlex in an international context.

There are a number of reasons for international collaboration in education. Firstly, it broadens perspectives and enhances the cultural competence of students. Then there is the increasing globalisation of the higher education market [2], the demand for graduates with intercultural competencies [3], and the strategic advantages of international partnerships [4]. Universities worldwide are expanding transnational education offerings to meet student demands for global experiences while addressing mobility constraints [5][6]. Within this landscape, HyFlex approaches offer promising solutions to bridge geographical divides.

The pilot we discuss here arose from an initial challenge in 2022 - to develop a transnational environmental law and clinical legal education module between India and the UK. The course needed to accommodate teaching across three classrooms in different geographical locations. It might be taught from any of those locations. The Transnational Remedies for Environmental Harm with Clinical Legal Education ('TREH') LLM course emerged from a collaboration between King's College, London (King's) in the UK, and two Indian universities: Jindal Global Law School (JGLS) in Delhi and West Bengal National University of Juridical Sciences (NUJS) in Kolkata. It responds to climate change as a transnational issue requiring coordinated global action. The programme integrates Clinical Legal Education (CLE) to build students' practical skills alongside academic knowledge of cross-border environmental remedies. For example, students in the UK might practice interviewing a client who is in India, with a student interpreting there. Another of the key CLE skills taught is teamwork, necessitating a means for students to work on activities in class in transnational teams. It was necessary for the technology to function effectively to enable dynamic exchange among participants.

A crucial consideration was striving for decolonial approaches, ensuring equal teaching contributions from both Global North and Global South perspectives. Academics worked with technicians to develop a proposal to meet these complex demands, resulting in a novel approach which was launched in early 2023 [7].

This research explored the effectiveness and pedagogical impact of using the HyFlex model in a transnational context. The desired learning outcomes were to introduce students to the emerging discipline of Transnational Environmental Law, to provide access to clinical legal education at a master's level and to facilitate cross-cultural education between the UK and India. The research considers if these were met and how such a learning model affects student engagement and the overall educational experience.

Our research questions

We explored several key questions regarding the effectiveness and pedagogical impact of using the HyFlex model in a transnational context.

• RQ1: 'How does the HyFlex model facilitate international collaboration; specifically, how does it support cross-cultural communication and understanding?'

- RQ2: 'What are the pedagogical benefits of using the HyFlex model for a transnational environment, examining its impact on student engagement, participation, academic performance, and practical skills development?'
- RQ3: 'What challenges are encountered in implementing HyFlex learning in a transnational context, to what extent can these challenges be remedied, and what strategies might effectively address them?'

2. LITERATURE

HyFlex learning [1] offers a versatile model that accommodates various learning preferences by potentially allowing students to choose between attending classes in person, synchronously online, or asynchronously. Binnewies [8] expands on this by examining the design and delivery of HyFlex courses. Detyna et al. [9] further explore the challenges of the HyFlex model, highlighting the increased cognitive load, the importance of high-quality audio and video, and the need for robust technical and pedagogical support to ensure equity between online and in-person learners.

The application of HyFlex in an international context is a relatively novel concept with limited but emerging research. Its flexibility makes it particularly suitable for transnational education, where students from different geographic locations and time zones can participate in the same course. The work of Liu and Rodriguez [10] highlights the potential of HyFlex to bridge the gap between students in different countries, enabling a more globalised learning experience. In their study, Detyna and Dommett [11] introduce the $2 \times n$ matrix model, a framework specifically designed to address and resolve issues in HyFlex and dual-mode teaching.

As discussed in the introduction, the academic literature also presents several reasons why internationalisation is important. According to research by Yemini, M & Sagie, N [12], internationalisation at home and abroad are two key themes of the internationalisation agenda, and key benefits include improving academic quality and accessibility of education.

There is an emerging body of literature on using HyFlex in a transnational or international context, but few papers have been published on this topic thus far. Graffy [13] writes about international education from a legal perspective, arguing that it can break down barriers with technology.

By facilitating cross-cultural interactions, the HyFlex model's flexibility potentially allows for the inclusion of diverse cultural perspectives in the curriculum, thus enhancing students' cultural competence. This model provides opportunities for students to engage with content and peers from different cultural backgrounds, promoting a deeper understanding of global issues and cultural diversity [14]. Similarly, Teunissen [15] suggests that collaborative international education also enriches the learning experience by exposing students to diverse viewpoints and legal practices, which is critical for fields like environmental law that demand a broad, multidisciplinary approach. This approach has been shown to improve intercultural attitudes, knowledge, and motivation by connecting students from different cultural backgrounds in virtual learning environments [16].

Ambrose et al. [17] discuss various international approaches to HyFlex, comparing implementations in Israel and the United States. However, it is important to note that their comparison focuses on different national approaches rather than simultaneous connections between international institutions. Institutions employ a range of transnational education delivery models, from branch campuses to online courses, emphasising flexibility and adaptability in meeting diverse student needs across different geographic locations. Critical success factors include robust partnerships between institutions, quality assurance mechanisms to maintain educational standards, and the need for cultural sensitivity in curriculum development to ensure that education is relevant and accessible to international students. Incorporating global perspectives into teacher training programs is also crucial, as it prepares educators to operate in diverse cultural settings and bring global perspectives into their classrooms.

While the benefits of HyFlex learning in transnational education are clear, there are also significant logistical challenges. These include different semester patterns and teaching schedules (exacerbated by time zones), different technologies in different countries, and power outages in lower-income countries. Bockorny et al. [18] highlight that the success of HyFlex models depends heavily on the technological infrastructure and the ability of institutions to support synchronous and asynchronous learning effectively.

The flexibility of the HyFlex model is widely recognised, but student experiences vary significantly depending on their access to resources and personal learning preferences. Some students appreciate the ability to tailor their learning to their schedules; others find the asynchronous component less engaging and isolating. Detyna and Koch [19] emphasise that student satisfaction in HyFlex settings largely depends on the quality of interaction with faculty and peers and the effectiveness of the digital platforms used.

While the flexibility of the HyFlex model is widely recognised, student experiences with the approach vary significantly depending on their access to resources and personal learning preferences. Some students appreciate the ability to tailor their learning to their schedules, while others find the asynchronous component less engaging and isolating. Detyna and Koch [19] emphasise that student satisfaction in HyFlex settings largely depends on the quality of interaction with faculty and peers and the effectiveness of the digital platforms used.

This is a relatively new topic so few if any previous researchers have written on this precise subject, although there are some researchers who've looked at similar concepts. Probably the most similar is Yu et al [20] who found that 'transnational hybrid learning offers

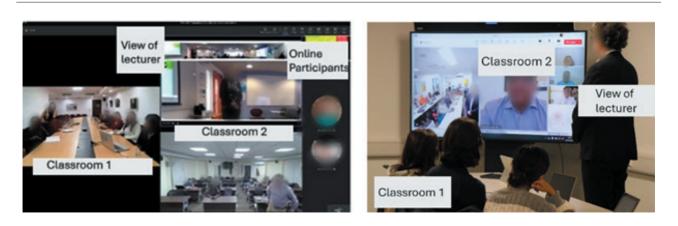


Figure 1. The image on the left shows the 'MS Teams' view. The image on the right shows the classroom view

students greater geographical and time flexibility, room for self-paced learning and controls on health risks while ensuring face-to-face interactions and physical activities'. Additionally, Qureshi, F. [21] looked at hybrid learning touching briefly on a transnational context, finding that the most effective aspects were the flexibility, the back-up option and convenience and the least effective was the lack of help, online class participation and technical issues. Detyna et al [22] touched on hybrid transnational teaching briefly as part of a broader look and different approaches, and have very limited results on this topic, but found it could potentially be enriching their academic understanding of the subject, and that during the course students were encouraged to reflect on their experience.de Freitas et al [23] looked at the related concept of blended learning (rather than HyFlex learning) but gathered student feedback in a transnational context and found that all students found the online resources useful and student commencing after the changes had been implemented reported higher levels of satisfaction and lower frustration.

3. METHODOLOGY

This section describes a case study of the collaboration between two international institutions to deliver the Transnational Remedies for Environmental Harm with Clinical Legal Education ('TREH') module. A research ethics minimal risk self-registration form was submitted for this study. No personal information from the participants was collected, ensuring the privacy and anonymity of all involved. The survey was distributed at the end of the module, and 12 students participated. Data was gathered through questionnaires distributed to students in the UK and India who completed the module in 2024, aiming to capture their experiences and feedback on the HyFlex learning model.

Room set up

The seminars were hosted using MS Teams. KCL used two sets of cameras, one the "Meeting Owl Pro" camera, which allows zooming into staff and student faces, and the "Huddly" camera, which was used when a full student view was required. The large HyFlex screen was used to view the external parties, and the projector was used for any slides. Screensharing and spotlighting the different classrooms on MS Teams was also utilised. NUJS used a lecture capture camera, a webcam, and a roaming microphone in combination with OBS so they, too, could change the view on the fly depending on what was needed. Microsoft Teams' screen-sharing and spotlighting features facilitated interaction between the different classrooms, so instructors could highlight specific participants or content, ensuring that the focus remained on the most relevant aspects of the seminar. This was particularly useful in managing the flow of the seminar across different geographical locations and maintaining a cohesive learning environment. The large HyFlex screen and projector screen at KCL allowed for the simultaneous display of external participants and presentation slides. This dual-display setup ensured that remote and in-person students could participate without missing any visual content, bridging the gap between physical and virtual classrooms.

4. RESULTS

In the survey, students rated their level of agreement for each question over the duration of the module. Responses to these questions are represented in Table 1.

"There was sufficient clarity of the lecturer's audio and video in sessions for me to understand the	"Any technical disruptions experienced were out- weighed by the overall learning outcomes of	"There were very high opportunities for cross-cultural exchanges and learning from diverse perspectives in	"This course was effective in facilitating cross-cultural commu- nication and exchanges
understand the	learning outcomes of	diverse perspectives in	among students "

Table 1. Overview of challenges in agile meetings, and corresponding solutions

sp among students. this course." course. the course. Strongly agree 17 33 33 42 67 50 50 17 Agree Neither agree nor disagree 0 8 8 42 8 8 0 Disagree 17 Strongly disagree 0 0 0 0

5. DISCUSSION

As context, the students surveyed had experienced regular technical difficulties during classes. Class start times were often delayed by setup issues, particularly because the preceding class used different technology requiring reconfiguration before the Hyflex session could start. There were also delays in putting students into breakout rooms for teamwork. Indian participants had to tune into English accents and vice versa. Another factor was disparate teaching cultures, with more interactive styles in the UK.

Against this background, the results are encouraging, and supported by extremely positive anecdotal evidence from the 2023 and 2024 student cohorts. The findings from this study demonstrate that the HyFlex model can facilitate meaningful international collaboration, encouraging cross-cultural communication among students despite numerous obstacles. This addresses our first research question (RQ1): HyFlex enables students from different cultural backgrounds to engage in realtime discussions and joint activities, thereby potentially promoting a deeper understanding of global issues and cultural diversity. In practice, connecting the UK and Indian classrooms allowed participants to share their respective diverse perspectives on environmental law, hearing from local lawyers and communities. Such interactions can bridge the gap between geographically separated learners, creating an opportunity to understand and empathise across cultural divides. In particular, the focus on transnational environmental law benefited from the exchange of viewpoints across jurisdictions, echoing Teunissen's [15] observation that exposure to diverse legal practices enriches learning in this field.

Of course, bringing students from different countries together does not automatically guarantee strong crosscultural engagement. We observed that participants joining remotely from another country could sometimes feel less connected than those physically present with the lecturer. This indicates that a HyFlex environment may lead to weaker social bonds for students who primarily engage remotely, highlighting the need for deliberate community-building across modes. Instructors also had to actively encourage interaction between the two cohorts to ensure that all students felt included. We learned the importance of prior induction and training on the systems for instructors for best outcomes. These observations suggest that, while international HyFlex classes hold promise for cross-cultural exchange, extra efforts may be necessary to cultivate a cohesive learning community.

To promote equity between students, we found it essential to provide equitable access to learning materials and opportunities for all studentsin. One of the advantages of Hyflex is that it is a relatively cheap means of sharing resources, allowing the transfer of knowledge between Global North and Global South institutions. Teaching strategies were adapted to offer recorded lectures, discussion transcripts, and other resources so all participants could access the same content. This approach aimed to minimise any gaps in information or opportunity. Prior studies have noted the importance of robust support and high-quality resources to ensure equity between learners in different locations [13]. The availability of class recordings and discussion forums gave students the flexibility to catch up on missed sessions due to time differences or other conflicts.

Another positive outcome of our HyFlex implementation was the development of valuable skills and high student satisfaction, addressing RQ2. Students reported that the transnational HyFlex format kept them engaged and prompted active participation. Our findings suggest that the HyFlex model can enhance student engagement and teamwork skills when executed in a transnational context. This aligns with observations by Detyna and Koch [7] that student satisfaction in hybrid settings depends largely on the quality of interaction and collaboration experienced.

However, the implementation of HyFlex learning in a transnational context is not without challenges." In our experience, one of the most prominent difficulties was inconsistent technology setups across the participating institutions, which led to uneven learning conditions. Each university had different hardware and software arrangements, resulting in variable audio and video quality during the sessions. For example, at one partner site, a wireless microphone caused audio distortion, while another site's basic microphone had limited range, forcing it to be moved around frequently. At the UK campus, despite the use of a more advanced 360° camera there were also difficulties. These technological disparities occasionally made it hard for remote participants to hear or see everything clearly, which could hinder their full engagement. The need for high-quality, reliable audio-visual equipment is therefore critical. Consistent with Detyna et al. [8], our findings underscore that investing in robust technical tools and support is essential to ensure all students have an equitable experience. Such issues reinforce the point that the success of HyFlex depends heavily on strong infrastructure, technical support and assistance

Teaching a HyFlex class is demanding but rewarding. It required instructors to split their attention between those in one physical room and those in another country who could be seen virtually through the screens, significantly increasing cognitive load. This aligns with earlier findings that HyFlex teaching can strain instructors due to its complexity. It was easier for students to interact with the lecturers in the same room simply because they were immediately visible and audible. In contrast, students from the remote class may need encouragement to participate in a discussion with a lecturer from another country.

Despite these challenges, we identified several strategies and adjustment to render the transnational HyFlex model workable. Dedicated technical and instructional support proved invaluable. During our sessions, the presence of on-site support staff was a key factor in addressing issues promptly. This allowed the lead instructor to focus on teaching while others handled troubleshooting – for example, fixing audio problems or monitoring the chat for questions. By quickly resolving technical glitches as they arose, the support staff minimised disruptions and kept the class flow intact. Our experience here reinforces the recommendation that HyFlex programs should include robust support mechanisms to assist both instructors and students.

From a technology perspective, leveraging advanced digital tools enhanced the experience. For instance, using multiple cameras and the screen-sharing features of Microsoft Teams enabled all participants to see both the speaker and the presentation materials, creating a more immersive environment. Students responded positively to these tools; many commented that the technology made the joint sessions feel more interactive and inclusive. This outcome is consistent with the idea that when used effectively, technology can break down geographic barriers and connect learners in a shared educational space. In fact, the ability to speak to and see peers on another continent in real time was frequently cited as a highlight of the course. The synchronous discussions - complemented by the available recordings for review - allowed students to engage in a truly cross-campus dialogue that would have been logistically impossible without such a HyFlex setup.

Whilst the transnational HyFlex approach offers exciting opportunities, it is important to maintain a critical perspective on its limitations. It should be acknowledged that our findings come from a specific context (a particular subject and partnership between institutions in two countries); therefore, results may not be applicable to all settings. Different disciplines or less technologically prepared institutions could face additional hurdles. Nonetheless, the lessons from this case study can inform broader practice. To address the identified issues, certain improvements are suggested. Institutions aiming to implement international HyFlex courses could invest in higher-quality equipment and dedicated IT support staff to ensure smoother communication across sites. We should note that over the two years, this program has run, the delivery has improved as we have learned and continually evolved towards a smoother process, and higher quality, simpler technology is being introduced.

Additionally, flexibility in scheduling (such as rotating class times or integrating asynchronous modules) might alleviate time zone pressures. Providing instructors and students with training for HyFlex environments – for example, using the technology confidently and using cross-cultural communication skills – could also enhance engagement and mitigate misunderstandings. By pro-actively tackling the technological, engagement-related, and pedagogical constraints, lecturers and administrators may improve the effectiveness of HyFlex learning. Our discussion reinforces the key theme that HyFlex education offers promising benefits for international collaboration and learning when executed in a transnational context yet demands careful attention to infrastructure and inclusive teaching practices.

6. CONCLUSION

Participation in a transnational HyFlex course gave students a unique opportunity for cross-cultural communication. It provides an opportunity to develop valuable skills, including adaptability and digital and cultural literacy, which are highly relevant in today's global job market. Additionally, faculty members engaged in international collaborations, which facilitated research partnerships and professional networking. For HyFlex learning to be sustainable in a transnational context, several improvements are recommended: dedicated IT staff should be available in each institution to provide immediate assistance. Investing in higher-quality microphones and cameras can improve overall learning experiences. Flexibility in class timings and increased use of asynchronous resources can address time zone challenges. Providing instructors with training on managing HyFlex environments will help optimise student engagement and learning outcomes.

To measure the success and viability of the HyFlex module over time, multiple approaches can be employed. Key performance indicators, which include student engagement levels, participation rates, and the overall satisfaction of both students and staff, are gathered through surveys and feedback forms. Academic performance of student outputs, such as assignments and participation in discussions, could be monitored to assess the educational impact of the module.

7. ACKNOWLEDGMENT

We would like to acknowledge the support and work of Phil Blake, Clare Thompson, Ammar Shirwani and Şimal Efsane Erdoğan. We would also like to acknowledge the input of staff at Jindal Global Law School and the West Bengal National University of Juridical Sciences, especially Ankita Chakravarty, in making this initiative successful.

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