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TOWARDS GLOBAL INTERCULTURAL & INTERDISCIPLINARY PROJECT-BASED LEARNING: THE EVOLUTION OF THE GIPE EDUCATIONAL MODEL

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Abstract

The evolution of the Global Intercultural Project Experience (GIPE) Educational Model exemplifies the dynamic transformation of higher education towards more globally integrated and interdisciplinary learning environments. Based on experiences from bilateral German-Namibian "International Software Engineering Project" courses in 2015 and 2018, we responded to the German Academic Exchange Service's (DAAD) "UAS.International" program call and expanded our educational reach through partnerships in Latin America and Southeast Asia under the GIPE framework from 2019 to 2023. Even amidst the global pandemic's travel restrictions, the program adapted by implementing fully online Collaborative Online International Learning (COIL) methods, maintaining the delivery of valuable student-led solutions to international clients. As the global situation improved, the return to in-person engagement at the 2022 Spring School in Germany and client visits enabled deeper intercultural collaboration and personal growth, fostering an enduring network within the "GIPE family." This progressive model evolved from software-focused projects to interdisciplinary challenges that involve diverse academic fields such as IT, Business, and Engineering. Notably, in 2023, the program's partnership with the United Nations Development Program (UNDP) Accelerator Labs demonstrated its evolution from engaging local clients to executing projects on a global scale, illustrating the capacity of higher education methodologies to adapt and thrive in an interconnected world. Aiming to make Intercultural Project-Based Learning an integral component of Higher Education, the model has further developed into the Global Sustainable Intercultural & Interdisciplinary Project Experience (GIPE++) framework. With additional funding from DAAD and Erasmus+ for the next three years, GIPE++ is poised to emphasize sustainability both in project focus on the United Nations' Sustainable Development Goals (UN-SDGs) and in perpetuating the approach itself, ensuring its enduring impact on global education.

Keywords: *Project-based learning, intercultural learning, interdisciplinary learning, collaborative online international learning, interdisciplinary students project.*

1. Background

The evolution of educational models has been shaped by the changing needs of society, technological advancements, and pedagogical research. Traditionally, education followed a teacher-centered model characterized by one-way knowledge transmission and rote learning (Freire, 1970). However, the shift towards constructivist theories in the late 20th century emphasized active learning, critical thinking, and student engagement (Piaget, 1954; Vygotsky, 1978). This change paved the way for learner-centered approaches that focus on personalized instruction and collaborative projects (Bransford, Brown, & Cocking, 2000). The integration of technology in the 21st century further transformed education, facilitating blended and online learning environments that offer greater flexibility and access (Graham, 2006). Educational models have then increasingly adopted competency-based frameworks that prioritize skill mastery over seat time, reflecting the demand for graduates who are prepared to navigate and contribute to a rapidly changing world (Sergis, Sampson, & Pelliccione, 2018). As pedagogical research continues to evolve, educational institutions are exploring interdisciplinary, experiential and project-based learning strategies to better equip students with the critical skills necessary for the 21st century. With economies and societies becoming more interconnected, the workforce also faces global challenges requiring not only technological proficiency but also critical thinking, adaptability, intercultural awareness and cross-cultural communication (Wilson, 2010).

2. Related work

Project-Based Learning (PBL) is effective in promoting hands-on learning through real-world challenges (Bender, 2012). This approach engages students in projects that mirror professional settings, fostering deeper understanding and practical application of knowledge (Bell, 2010), preparing them with critical thinking, problem-solving, and collaboration skills needed in the modern workplace (Krajcik & Shin, 2014). Moreover, addressing complex issues like climate change, public health, and technological innovation requires collaborative, cross-disciplinary solutions.

Intercultural and Interdisciplinary Project-Based Learning (IPBL) is essential for solving real-world problems by combining interdisciplinary approaches with intercultural settings to enhance understanding and communication among diverse cultural groups (Gregersen-Hermans, 2017; Warr & West, 2020). Hart (2019) explores how IPBL in intercultural groups enhances students' intercultural competence. It underscores the importance of reflective practice and structured interaction in developing the ability to navigate and appreciate cultural differences. The findings suggest that PBL environments, where students engage with real-world issues from multiple disciplinary perspectives, can significantly improve their intercultural skills alongside their academic learning. Oladiran, Uziak, Eisenberg, and Scheffer (2011) report on the Global Engineering Teams (GET) program that promotes project-oriented tasks in virtual student teams working in collaboration with industry partners. Students from different countries and disciplines collaborate on engineering design projects. It illustrates how technology can facilitate international collaboration among students, allowing them to apply their diverse knowledge and cultural perspectives to create innovative solutions.

Collaborative Online International Learning (COIL) is recognized as an innovative, cost-effective method that promotes intercultural learning through online faculty and student collaboration across countries (Rubin, 2017). Although online collaboration in student projects began in the 1990s, the focus on international and intercultural aspects has gained prominence only recently (Brereton, Gumbley & Lees, 1998; Appiah-Kubi & Annan, 2020).

Focusing on sustainability challenges, Sulkowski, Kowalczyk, Ahrendsen, Kowalski, and Majewski (2020) highlight a program where students from various disciplines and countries collaborate on projects aimed at promoting sustainable development. The initiative showcases how PBL with an intercultural and interdisciplinary focus can lead to innovative approaches to sustainability, encouraging students to think critically about environmental, economic, and social issues from a global perspective.

All related work underscores the effectiveness of interdisciplinary project-based learning in fostering not just academic growth, but also intercultural competence and collaborative skills (Brassler & Dettmers, 2017).

3. The GIPE (Global Intercultural Project Experience) Educational Model and its evolution

The evolution of the GIPE Educational Model took place over more than a decade now, from small bilateral software engineering projects towards a now well-established framework for global intercultural and interdisciplinary students' projects on sustainable development goals tackling real-world problems of real clients in the countries of our partner universities.

3.1. Intercultural collaboration on (distributed) software development projects

In 2014, we desiged a course "International Software Engineering Project" at our university and our partner university in Namibia getting students to apply theoretical knowledge to real-life software projects in international set-ups covering all phases from requirements collection to the final hand-over. In 2015 and 2018, two instances of this distributed software development approach were run including one-week visits to Namibia strengthening intercultural collaboration and awareness. While requirements gathering and project planning was partly done together on-site in Namibia ("Presence"), development was online and deployment was organized by the Namibian partner locally ("*Presence-Online-Local*").

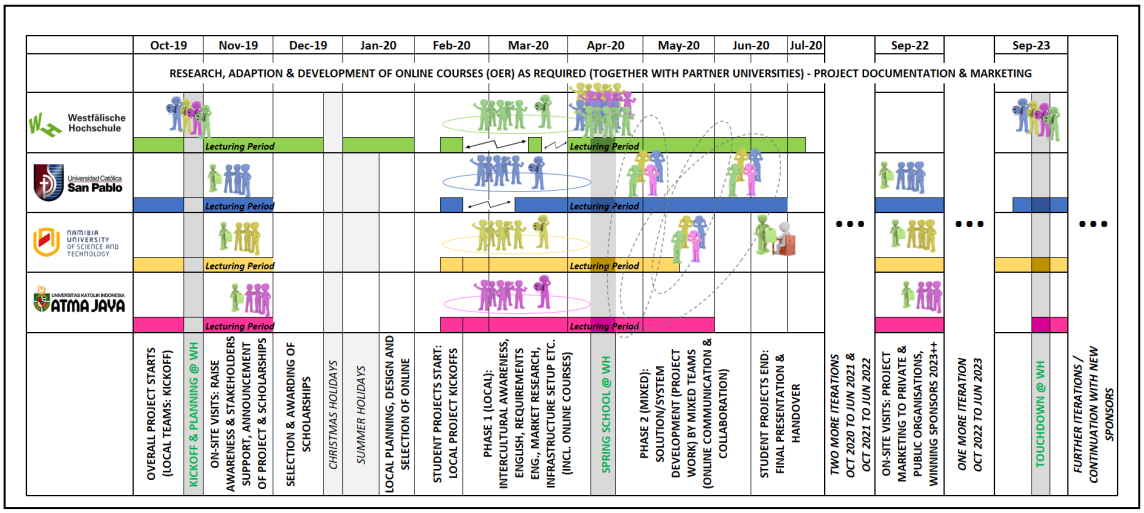
3.2. Towards a global intercultural project experience – Dawn of the GIPE framework

In 2019, we responded to an initiative by the German Academic Exchange Service (DAAD) aiming at strengthening internationalization efforts at German Universities of Applied Sciences and developed a framework that integrates IPBL and COIL, augmented by short-term physical mobility phases, to provide deeper intercultural exposure and facilitate effective online collaboration across continents and cultures. Over four years, from 2020 until 2023, we were able to offer selected students from participating institutions in Germany, Indonesia, Namibia and Peru the opportunity to gain a truly Global Intercultural Project Experience (GIPE) by working over one semester in a multicultural team on an international project for a real client (Meyer et. al., 2022a).

The annual student projects take place from February to June/July (subject to different academic calendars and lecturing periods) proceeded by client and project selection, evaluation of students' applications and awarding scholarships as well as requirements gathering and project planning together on-site ("*local*") with the selected client. The students' projects then run in four phases (see Figure 1):

1. Online collaboration preparation: A virtual global kick-off event brings all stakeholders together. Students then get prepared for the various project tasks through targeted trainings. Students join the project in intervals depending on the home universities lecturing schedules.
2. Two-week face-to-face phase (*"presence"*): All participating students and one representative lecturer from each university meet in Germany for team-building, intercultural exposure and mixed-team-setup ('Spring School').
3. Online collaboration: the students continue working on their project tasks in mixed teams using various web-based collaboration tools ("*online*"). They are instructed ('guided') by academic staff from all partner institutions and different disciplines, e.g. in the 2021 project, a business sub-project ("stream") was guided by a lecturer/researcher team from Peru and Indonesia while another stream focusing on the developing of an educational adventure game was guided by a German academic together with a colleague from Namibia.
4. One-week project-touchdown and hand-over: The German students travel to the client in Peru, Namibia or Indonesia (alternating) offering them a true international exposure too (*"presence"*).

Figure 1. The Masterplan for the GIPE Framework 2019-2023.



Due to travel restrictions during the Covid-19 pandemic, the 2020 students project was held almost entirely online ('pure COIL') except for early requirements gathering on-site while in 2021 at least the hand-over to the client in Indonesia could take place later the year and with only a few students travelling. The planned "*Local-Presence-Online-Presence"* model thus could only be held as "*Local-Online-Online-Online"* or "*Online-Online-Online-Presence"* respectively. Nevertheless, even almost without any meeting in person, both student projects were completed successfully and the results appreciated by the respective clients. However, in (Meyer et. al., 2022b) we explicitly discuss the importance of physical meetings during the two-week Spring School which is essential for our approach.

3.3. From software development to multi-disciplinary students' projects

While the first students' project within GIPE in 2020 focused on the development of a web-portal for a parastatal institution in Namibia, the focus of the 2021 project serving an eco-spirit center in Indonesia was already broadened allowing students from various disciplines to join and work on different tasks ranging from the development of a web-based booking system, a new business model, the implementation of a multi-layer educational computer game to the monitoring of sensor data through Internet-of-Things (IoT) technology. However, the various sub-projects ("streams") were run almost independently without much interaction or dependencies.

This changed slightly with the 2022 students' project serving a school in the outskirts of Arequipa (Peru) where all stream results got integrated under the roof of a newly developed website. Additionally, the dying out of the Covid-19 pandemic allowed for student mobilities in both directions leading to much deeper intercultural understanding and collaboration, fostering personal growth and establishing worldwide friendships within the "GIPE family". However, as the Spring School (to be more safe) had to be moved to June, this resulted in a "*Local-Online-Presence-Presence*" pattern with the handover visit of the German students to Peru following shortly after the "Spring School" in Germany.

3.4. Serving a globally distributed client – the UNDP students' project

When in 2023 we proudly served the United Nations Development Program (UNDP) Accelerator Labs in all our partner countries, the evolution of the GIPE Educational Model took the next step from a local to a globally distributed client. This allowed the local student teams to gather local requirements through on-site visits and meetings with client representatives in their respective countries – except for the German students who focused on global requirements during this first project phase. As the Spring School could also be held at the beginning of the joint lecturing period in April, this for the first time allowed for an early intercultural exposure and team-building, resulting in the implementation of the "*Local-Presence-Online-Presence*" pattern as originally planned for in the GIPE framework.

3.5. Focusing on Interdisciplinarity and Sustainability – from GIPE to GIPE++

Although the impact of the Covid-19 pandemic only allowed a proper implementation of the "*Local-Presence-Online-Presence*" pattern within the final project in 2023, observations and feedback from all project participants at the final GIPE conference ("GIPECon") in late 2023 confirmed that this approach led to the best results as regards intercultural awareness and collaboration. Moreover, although this combined approach comes with increased complexity as regards governance, project management and administrative support, it did not only have the intended impact on the participating students, but has also shown significant impact on both academic and administrative staff, their collaboration and personal growth as well as the participating HEIs as such (Meyer, 2024a).

Therefore, aiming at Intercultural Project-Based Learning becoming an integral part of Higher Education, we further developed GIPE into a more flexible Global Sustainable Intercultural & Interdisciplinary Project Experience (GIPE++) framework with funding now granted for three more years from DAAD and Erasmus+ which supports the next evolutionary step towards sustainability as regards both the projects' focus on UN-SDGs and also the GIPE/GIPE++ approach itself: All students' projects will explicitly address the UN-SDGs, e.g. the fight against the impact of climate change. Moreover, the students' projects now focus on true interdisciplinarity rather than offering mostly independent tasks for students from a variety of disciplines (multi-disciplinarity).

Therefore, in the current 2025 GIPE++ students' project serving a local community on a small island in the Jakarta Bay (Indonesia), in each stream students from various fields collaborate on tackling some client problem contributing to an overall solution to one major problem. In this case, students are conducting a baseline environmental study, analysing the current situation, e.g., as regards land erosion or beach pollution, its causes and possible remedies leading to a business model for sustainable tourism including social media and fundraising campaigns, a booking platform for local homestays as well as activities like mangrove planting, waste collection or creation of souvenirs, all integrated in one website.

The new GIPE++ framework thus fosters holistic and innovative approaches to problem-solving, encouraging students to think beyond the confines of their own disciplines. This cultivates critical soft skills such as teamwork, communication, and conflict resolution, as students learn to effectively work with others who have different expertise, perspectives or cultural background (Meyer, 2024b).

4. Conclusions

The GIPE++ concept of Interdisciplinary and Intercultural Project-Based Learning in the context of sustainable development goals has evolved over more than a decade from a small yet visionary course design in 2014 – and will further evolve. It offers numerous advantages in higher education, from enhancing student engagement to developing critical thinking, cultural awareness and collaboration, as well as real-world application skills. By fostering more active and student-centered learning, GIPE++ prepares students not only to succeed academically but also to excel in their future careers.

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