Instructor Profile in Global Shared Learning Classroom: Development of Competencies and Skills

Patricia Caratozzolo, Tecnológico de Monterrey, Mexico

Patricia Caratozzolo received her Ph.D. from Universitat Politécnica de Catalunya, Barcelona. She is a Full Member of the Institute for the Future of Education and an Assistant Professor at Tecnologico de Monterrey, Mexico. She leads projects in Educational Innovation, Critical Thinking, Cognitive Flexibility, and the development of Social Oriented Interdisciplinary Skills in STEAM. Dr. Caratozzolo is a Senior Member of IEEE, a Member of the Executive Committee of the Mexican Chapter of the Organization of Women in Sciences for the Developing World (OWSD), a Member of the National System of Researchers (SNI) of the Mexican Council of Educational Research (CONACYT), and Vice President of the International Association of Continuing Engineering Education (IACEE).

Luis Alberto Mejía-Manzano, Tecnológico de Monterrey, Mexico
Rebeca Maria Garcia
Maria Ileana Ruiz-Cantisani, Tecnológico de Monterrey, Mexico
Patricia Vázquez-Villegas, Tecnológico de Monterrey, Mexico

Dr. Patricia Vázquez-Villegas has a bachelor's degree in the Food Sciences Engineering program and a Ph.D. in Engineering Sciences from Tecnologico de Monterrey. She has experience working in the development and application of sustainable platforms for the purification and detection of biomarkers. Has made research internships at the Michael Smith Laboratories at the University of British Columbia and the Water Center for Latin America and the Caribbean. In 2018 she was Coordinator at the Writing Lab of the Institute for the Future of Education. She is the co-author of 29 ISI indexed scientific publications, 1 book, 2 book chapters, and co-inventor of 4 intellectual properties. She is a member of the Mexican National System of Researchers. Her contributions in the field of sustainability have been in biotechnology, cereal sciences, energy efficiency; and active learning in education. https://orcid.org/0000-0003-1568-4954

Vianney Lara-Prieto, Tecnológico de Monterrey, Mexico
Edgar Omar Lopez-Caudana
Jorge Membrillo-Hernández, Tecnológico de Monterrey, Mexico

Instructor Profile in Global Shared Learning Classroom: Development of Competencies and Skills

The needs of Industry 4.0, and the globalization of workplaces, set new requirements for workers entering the job market, including the ability to function in intercultural environments and global societies. Therefore, higher education Institutions should promote global citizenship learning through Collaborative Online International Learning (COIL) strategies, an innovative way to engage students in a global, multicultural, shared learning environment. One COIL option is the Global Shared Learning Classroom (GSLC) approach which has at least four weeks in which complex problems that transcend borders are analyzed and addressed. Instructors must be able to guide students to identify, discuss and solve these problems online and in a short time. This work explores several COIL experiences carried out during the last five years (including experiences during COVID-19 and post-pandemic) between Latin American and European universities. The study includes evaluating different training programs for instructors carried out to meet the appropriate profile of COIL leaders. In addition, rubrics are suggested to diagnose and assess transversal competencies such as intercultural communication, critical thinking, global citizenship, multicultural collaboration, adaptation to virtual work environments, and the use of technologies. The results show that GSLC instructors must possess solid knowledge of their specialization and be trained in specific global competencies and soft skills for COIL experiences to succeed.

Introduction

Involving education for global citizenship is defined by UNESCO as the "*empowerment of students to assume active roles, locally and globally, to build more peaceful, tolerant, inclusive and secure societies*" [1]. This vision includes the cognitive, emotional, and behavioral dimensions. In addition, it seeks to guarantee students an education under the Sustainable Development Goal (SDG) #4 (Quality Education), with the necessary skills and knowledge to promote sustainable development, including peace, non-violence, gender equality, and cultural appreciation [2]. However, these competencies are often not easily modeled in a conventional classroom with specific or limited problem situations. One strategy for meeting these high demands is Collaborative International Online Learning (COIL), particularly the Global Shared Learning Classroom (GSLC) approach. GSLC is a collaboration between two or more faculty members from different geographic locations or countries through technology to teach similar or related courses [3].

GSLC incorporates a pedagogical technique that uses technology to connect classrooms in other geographical areas [3]. It also includes an alternative *third space* (to promote the internationalization of Higher Education [4], [5]). GSLC fosters global learning through a collaborative process in which people analyze and address complex problems that transcend borders through international collaboration [6]. With the GSLC approach, students study, identify, discuss, and create solutions to real problems. In that way, students develop different transversal competencies such as intercultural communication, critical thinking, global citizenship, multicultural collaboration, and adaptation to virtual work environments. Some of the positive benefits that have been reported for COIL in Engineering [7] are the fostering of intercultural and international competencies, multiple forms of collaboration, increased student learning and engagement, and a flexible and cost-effective process since there is no mobility for the students [2], [3]. There is evidence that the implementation of COIL strategies has had positive effects, so it is expected that COIL will be applied more frequently in Higher Education Institutions (HEIs).

Although COIL programs are widely disseminated in Europe and the United States, implementation is limited in Latin America, mainly because teachers have no experience in these activities and are limited in preparing to carry out these training modules—technology-based learning in their courses. As in any teaching-learning process, one of the main actors is the teachers [8]. They may require specific skills and training to achieve a successful experience. Additionally, for instructors, this educational format can provide benefits such as enhancing their career portfolio or resume, expanding their professional community, and exchanging teaching practices and feedback [9]. In this line, it is clear that a definition of the instructor's profile is required since the courses with the COIL strategy are relatively new. Moreover, no formal faculty training programs include founding techniques to design courses with faculty of different universities, developing evaluation techniques for acquiring knowledge, and the correct weighting of each experience design.

This work analyzes GSLC experiences to define the instructor's skill set for successful learning. In addition, the objective is to reflect on the lessons learned and training needs of faculty enrolled in a GSLC to offer general recommendations for future programs.

Methodology

This research analyzes data from 20 GSLC experiences implemented during the last five years between Tecnologico de Monterrey and Universities in Latin America and Europe, focusing on the instructor profile to identify specific skills that a professor must have for a successful GSLC preparation and implementation. In addition, we studied the information on

professors, partners, course theme, teaching tools, and the percentage of students who finished the course compared to the number of students who entered the class with GSLC (course completion efficiency level). The organizational model under which these collaborations operate was obtained and is reported in this manuscript. A literature review was also conducted to identify competencies recommended for the instructor profile in this context. Finally, we analyze the information gathered from the implemented GSLC courses with our partner universities, the different training programs for the instructors, and other COIL course implementations reported in the literature. The information suggests the key elements to consider in the instructor's training program and the skills an instructor must develop for a successful GSLC experience. The analysis and conclusions of this work are relevant insights to be considered for the design of an instructor's training program and an assessment rubric to evaluate the instructor's transversal skills.

Results and Discussion

Table 1 was completed using the information obtained from the review of eight studies carried out by international universities (references [10] to [17]). The table shows that the profile of the instructors generally is with a specialty in their field (Ph.D. or master's degree), with passion for teaching, interest in linking with colleagues from other foreign institutions, collaboration skills, with the initiative to innovate in education and promote global skills in students and their courses. Another interesting finding in the profile of the professor who implements COIL is the interest in generating in their students these international skills even in environments with restrictions, such as what occurred with the pandemic, developing innovative ways to create multicultural environments in their learning experiences. Therefore, before describing the required profile of instructors, it is essential to define their roles and functions. Many reports based on online education have pointed out that the main functions and roles that instructors perform are the following: facilitator, researcher, designer, manager, advisor, and counselor [9], [10]. In this sense, some studies indicate the needs and requirements of pioneer organizations for COIL courses [11]–[13]. Therefore, five types of skills may be established for COIL instructors: field, pedagogical, technical/digital, socioethical management, and digital skills. These are depicted in Figure 1 and Table 2.

In general, field, pedagogical, socioethical management, and design skills are skills that any instructor must have. The added skills for COIL instructors are the technical or digital and socioethical management skills used to contextualize according to the COIL experience. Since the variability of teaching courses implementing COIL may be broad, one of the first requirements is primarily instructors' specialization in their field or area. The instructor must dominate the subject's content and be able to organize and prioritize the topics, linking the content with reality and, selecting learning sources, keeping up to date. As pedagogical skills, translation of knowledge to students is fundamental; the instructor transforms the inside of their discipline into understandable terms [13]. In addition, motivation, the guidance of students, and the promotion of group interaction are activities that any instructor must perform to arouse the interest of their students. Albrahaim [9] mentions knowledge about learning theories as a required skill for online instructors. Stewart justifies that understanding these theories, their applications, limitations, and refining provide instructors with a robust framework for organizing thinking and developing optime teaching designs [14]. Even instructors ratify the importance of knowing "how people learn" [10]. Design skills also are considered demanding tasks, which means the presentation and organization of the contents in acceptable formats for the students. This group has included the ability of the instructor to incorporate student feedback in new or improved courses [9].

Table 1. Instructor profiles of some of the partner universities.

Partner University	Course	Topic Area	Instructor Profiles	Reference
SRH Berlin School of Management	Risk management in financing	Business	Lecturer for Corporate Finance, Ph.D. in Economics, with experience as an independent consultant in the areas of corporate valuation, management accounting, and financial accounting	[10]
Pontifical University of Salamanca	Consumer Behavior	Business	Professors with graduate studies in Marketing or Business Management who can use technology for education as digital platforms and mobile devices.	[11]
International Design and Engineering Education Association	Design Thinking Methodology	Engineering Education/ Mechanical Engineering	Researchers specialize in rapid prototypes, computerized processing, and manufacturing.	[12]
Universidad de los Andes	Nutrition and Nutrigenetics	Bioengineering	Professor with graduate studies in nutrition and food technology. Researchers in innovational education.	[13]
María Cano Foundation of Medellín	Psychosocial Risk Factors at Work	Business	Researchers specializing in communication. "Manage unique accompaniment to students affected by" the pandemic. (p.3666)	[14]
University of Alicante	Entrepreneurship and creative industries	Art & Design	Researchers specializing in communication, with knowledge of educational methodologies, focused on the student and his learning and the use of technology in education.	[15]
Rice University	International Business Development	Business	Professors specialized in international business, emphasizing the use of the English language.	[16]
University of North Carolina Charlotte	Competitive Intelligence	Business	Different roles of teachers are identified as designers, administrators, facilitators, experts, and mentors.	[17]

Figure 1. Desired skills for instructors in COIL

Within the socioethical management skills, we have grouped social and ethical skills. One of the essential abilities is communication, not only oral and written communication but also using distinct channels or tools (e-mail, text messages, or chats). One related skill to communication is using comprehensiveness to clarify statements and notes [9], facilitating the students' feedback in diverse forms. In this part, ethical and social skills acquire a relevant role, so communication must be based on respect in a comfortable and sure environment considering cultural differences and institutional policies. Under this last point, instructors must also establish course policies and rules for class participation. In this same category, soft skills may be defined as inter and intrapersonal skills, abilities, and traits that let technical skills and knowledge be applied. As soft skills, we can classify communication, the ability to work in multidisciplinary teams, negotiation, conflict resolution, and decision-making [15].

Finally, technical/digital skills refer to the instructor's knowledge about technology as a resource for their classes and interaction. Particularly for COIL/ GSLC instructors, access to these technological tools is critical and considers the competencies [10] shown in Table 3. Two complementary skills in this group that not all the studies of educational researchers mention are understanding the capabilities and limitations of these technological tools and being attentive to updates of those technological advances. These are very important since the success of these resources in learning depends on their practical and appropriate use.

Maybe the most advanced and established program in instructor training for COIL experiences in the world is the agenda of the Suny COIL Center of the Purchase College campus at the State University of New York. This program was a pioneer and initially developed a COIL Course Orientation (CCO) of 5 weeks, introducing COIL designs and a series of recommendations about what works and what does not in COIL [18]. In addition, this same center offers diverse training options for developing a COIL course for customized or group online classes, support for planning and evaluation, or spokes [17].

Table 2. Specific skills of COIL instructors per group.

Group	Skills
Field	Knowing the content or subject matter
	Being updated
	Linking subject content with relevant phenomena
	Developing and selecting appropriate learning resources
	Developing an inventory of existing content and resources
Pedagogical	Translate content knowledge into "teaching."
	Motivating students
	Promoting group interaction, collaboration, and teamwork
	Student guidance
	Design and implementation of assessment resources
	Knowing learning theories
Technical/Digital	Accessing various technological resources and tools
	Understanding learning and teaching capabilities and limitations of those tools
	Being alert to the latest updates and renovations of technology and software
Socioethical Management	Using different communication strategies
	Using sufficient and understandable language
	Working in multidisciplinary collaborators teams
	Providing feedback through diverse forms
	Creating respectful relationships and considering cultural differences
	Maintaining a warm, friendly, safe, and comfortable environment
	Negotiation or resolving conflicts
	Decision making
	Leadership and management
	Demonstrating commitment to institutional policies
	Establishing and declaring course policies, rules for participation, and assignments
Design	Organizing content and activities
	Presenting the learning materials in different formats
	Using student's suggestions to develop and design new courses

Table 3. Considered competencies as a part of accessing technological resources.

Competence
Use of learning management systems
Use of e-mail
Use of webcam and chat applications
Navigate browser windows
Upload and download files.
Creation of PDFs
Develop audio/video materials.
Use of free tools

Additional to this extensive training, main initiatives were investigated:
For Latin American COIL instructors, training may include specific demands concerning interest, language, and topics, according to the findings of King [19]. Sixty participants of the LATAM COIL network (belonging to 10 countries and 47 different Universities) were anonymously surveyed, with 83 % expressing interest in future VE training. In this same study, participants manifested Spanish language training preference. Their biggest concern in the VE strategies was the aspects related to course planning (for example, partner finding, topic determination, or recruitment).

This year, the European Commission ERASMUS (EUROPEAN COMMISSION, Erasmus+ Programme) supports and funds a proposal that combines the work of European and Colombian universities, a German university, and the Tecnologico de Monterrey: "Digitalization meets university governance" (DigiUGob). The aim of this proposal is relevant to the objectives of the action "Capacity Building in Higher Education" and seeks to improve teaching in the beneficiary institutions [20]. However, the main aim is digitizing the university administration through international exchange and appropriate consultation formats. Therefore, it is precisely the COIL tool that is one of the cornerstones of this proposal. The role of Tecnologico de Monterrey in DigiUGov is to develop a quality assurance mechanism for digital teaching and learning and to exchange existing COIL experiences within this international consortium [14], [15], [21], [22]. Furthermore, based on its research and experience in the future-oriented digital learning format, Tecnológico de Monterrey will develop a fundamental quality assessment tool to examine COIL offerings in depth.

These may have been designed at short notice due to the rapid shift to digital mode at the pandemic's beginning. To ensure learners are at the center of their development, Tecnológico de Monterrey will evaluate the current COIL design of different didactic methods, synchronous and blended learning, and the combination of other digital formats in a pilot project. This project will report its results by the end of 2024 through the following summary of specific objectives to which this work package is linked:

- Develop recommendations for improving QA mechanisms and support structures based on previous COIL formats' experiences.
- Researchers will learn how to master the challenges of e-teaching at a university successfully.
- Network with other university teachers to learn about approaches to teaching in different cultural contexts and research fields.

- In think tanks, exchange on the future of (digital) teaching. Reinforce the notion of a "learning community."
- Training for different target groups, especially for persons with management responsibility and with committee activities - in administration and science

Conclusion and Future Work

It is a fact that most university professors did not study directly to become teachers. Some are engineers, architects, lawyers, biologists, or doctors, who have found a path of professional development in teaching. In reality, each teacher teaches, in many cases, how he learned best in his past and believes that the best way to teach is how his favorite teacher was. Therefore, establishing didactics and pedagogy centers that monitor teacher development is fundamental in higher education institutions. As a result, new, more complex, and ambitious educational models are implemented, and in many cases, such as the one described in this study, using technological tools, state-of-the-art where perhaps the teachers are not experts and have to acquire new skills. The Global Shares Learning Classroom is a powerful didactic technique that, in its first years of implementation, became an experimental technique to be an option in the path of internationalization of students, coupled with the new trend of "micro-credentialing by competencies." It may be that professionals "collect" or achieve certificates as digital "badges" that will serve them for their future jobs. In any case, being able to interact, compare, collaborate, be examined by external professors, and test the quality of education in other countries without leaving your own, is a unique opportunity that in the future will lead to a global school where the competencies are not only certified by certifying agencies but by active teachers, live, with actual exams, current courses and in an interaction between students and teachers that in the end will result in more global education to create citizens of the world.

References

[1] UNESCO, «What is global citizenship education?» *UNESCO*, 9 de enero de 2018. https://en.unesco.org/themes/gced/definition (accedido 23 de enero de 2023).

[2] Z. Jie y A. M. G. Pearlman, «Expanding Access to International Education through Technology Enhanced Collaborative Online International Learning (COIL) Courses,» *International Journal of Technology in Teaching and Learning*, vol. 14, n.º 1, pp. 1-11, 2018.

[3] P. Appiah-Kubi y E. Annan, «A Review of a Collaborative Online International Learning», *International Journal of Engineering Pedagogy (iJEP)*, vol. 10, n.º 1, Art. n.º 1, ene. 2020, doi: 10.3991/ijep.v10i1.11678.

[4] F. F. Guimarães y K. R. Finardi, «Global citizenship education (GCE) in internationalization: COIL as alternative Thirdspace», *Globalisation, Societies and Education*, vol. 19, n.º 5, pp. 641-657, oct. 2021, doi: 10.1080/14767724.2021.1875808.

[5] V. P. Misra, S. Rautela, A. Sharma, y P. Mishra, «Collaborative Online International Learning (Coil) in Teaching-Learning: Bridging the Student Mobility Gap in Internationalization of Higher Education.», *International Journal of Modern Agriculture*, vol. 9, n.º 3, Art. n.º 3, sep. 2020.

[6] J. Membrillo-Hernández, W. J. C. Bejarano, L. A. M. Manzano, P. Caratozzolo, y P. V. Villegas, «Global Shared Learning Classroom Model: A Pedagogical Strategy for Sustainable Competencies Development in Higher Education», *International Journal of Engineering Pedagogy (iJEP)*, vol. 13, n.º 1, Art. n.º 1, feb. 2023, doi: 10.3991/ijep.v13i1.36181.

[7] M. Blumthal *et al.*, «Developing Collaborative Online International Learning (COIL) projects in Engineering Education», presentado en 2022 ASEE Annual Conference & Exposition, ago. 2022. Accedido: 12 de febrero de 2023. [En línea]. Disponible en: https://peer.asee.org/developing-collaborative-online-international-learning-coil-projects-in-engineering-education

[8] D. Vlachopoulos y A. Makri, «Quality Teaching in Online Higher Education: The Perspectives of 250 Online Tutors on Technology and Pedagogy», *International Journal of Emerging Technologies in Learning (iJET)*, vol. 16, n.º 6, pp. 40-56, mar. 2021.

[9] F. A. Albrahim, «Online Teaching Skills and Competencies», *Turkish Online Journal of Educational Technology - TOJET*, vol. 19, n.º 1, pp. 9-20, ene. 2020.

[10] I. Drazic y R. Prell, «Digital exchange: the barrier-free experience abroad – a project by the SRH Berlin University of Applied Sciences», 2021.

[11] S. L. Hernández-Zelaya y E. Uribe-Bravo, «International academic collaboration: The Reinserta case», *International Journal of Excellent Leadership*, vol. 1, n.º 2, pp. 11-21, 2021.

[12] P. Orta, K. Kim, M. Löwer, G. Mendez-Carrera, P. D. Urbina Coronado, y H. Ahuett-Garza, «Padlet in IDEEA Global Course and Project», en *Visions and Concepts for Education 4.0*, M. E. Auer y D. Centea, Eds., en Advances in Intelligent Systems and Computing. Cham: Springer International Publishing, 2021, pp. 189-199. doi: 10.1007/978-3-030-67209-6_21.

[13] R. García García, I. Contardo Hernández, M. Ruíz Acin, A. Ramos Trujillo, V. Tejada Ortigoza, y J. Membrillo, «The Global Classroom experience, a didactic strategy to develop skills through Project-based learning. Lessons learned between Mexico and Chile in a multidisciplinary development on Food Science», en *Proceedings of the 20th LACCEI International Multi-Conference for Engineering, Education and Technology: "Education, Research and Leadership in Post-pandemic Engineering: Resilient, Inclusive and Sustainable Actions"*, Latin American and Caribbean Consortium of Engineering Institutions, 2022. doi: 10.18687/LACCEI2022.1.1.159.

[14] J. C. Vásquez y M. A. C. Buitrago, «Significant learning in the global classroom experience: psychosocial risks in pandemic times Mexico – Colombia (2020-2021)», *INTED2022 Proceedings*, pp. 3666-3671, 2022, doi: 10.21125/inted.2022.1021.

[15] J. C. Vásquez, P. E. A. Galicia, C. S. Olmos, y A. R. B. Gurruchaga, «A Global Classroom entrepreneurship and creative industries experience: Spain and Mexico - possibilities and challenges», *INTED2022 Proceedings*, pp. 3690-3695, 2022, doi: 10.21125/inted.2022.1027.

[16] A. M. Haduch, «Different application of COIL methodology in collaboration between Mexican and American Business Schools», *1*, vol. 63, n.º 1, Art. n.º 1, may 2022, doi: 10.33119/EEIM.2022.63.2.

[17] F. Martin, K. Budhrani, S. Kumar, y A. Ritzhaupt, «Award-Winning Faculty Online Teaching Practices: Roles and Competencies», *Online Learning*, vol. 23, n.º 1, pp. 184-205, mar. 2019.

[18] J. L. Rosales y M. R. Gutiérrez, «Applying a Collaborative Online International Learning Experience (COIL) during two Undergraduate Environmental Engineering Courses in the US and Mexico», presentado en 2022 ASEE Annual Conference & Exposition, ago. 2022.

[19] E. J. Rubin y S. Guth, *The Guide to COIL Virtual Exchange*. Sterling, Virginia: Stylus Publishing, 2022.

[20] T. Fumasoli y F. Rossi, «The role of higher education institutions in transnational networks for teaching and learning innovation: The case of the Erasmus+ programme», *European Journal of Education*, vol. 56, n.º 2, pp. 200-218, 2021, doi: 10.1111/ejed.12454.

[21] E. Miller, H. Ceballos, B. Engelmann, A. Schiffler, R. Batres, y J. Schmitt, «Industry 4.0 and International Collaborative Online Learning in a Higher Education Course on Machine Learning», en *2021 Machine Learning-Driven Digital Technologies for Educational Innovation Workshop*, dic. 2021, pp. 1-8. doi: 10.1109/IEEECONF53024.2021.9733776.

[22] P. Caratozzolo, C. J. M. Smith, P. Munoz-Escalona, y J. Membrillo-Hernández, «Exploring Engineering Skills Development Through a Comparison of Institutional Practices in Mexico and Scotland», en *SEFI 2022 - 50th Annual Conference of the European Society for Engineering Education*, Barcelona, Spain, 2022, pp. 1878-1883. doi: https://doi.org/10.5821/conference-9788412322262.1291.