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Collaborative Online International Learning (COIL): A Study of Enablers Using Total Interpretive Structural Modelling and MICMAC Analysis

Nehajoan Panackal[1], Adya Sharma[2] and Sonica Rautela[3,*]

Symbiosis Centre for Management Studies, Symbiosis International (Deemed University), Pune, India
E-mail: [1]<nehajoan.panackal@scmspune.ac.in>, [2]<adyaindia@gmail.com>, [3,]<sonicaonnet@gmail.com>*
ORCID: [1]<https://orcid.org/0000-0002-9552-6763>, [2]<http://orcid.org/0000-0001-7040-0278>, [3]<https://orcid.org/0000-0002-2891-3819>

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ABSTRACT Internationalisation of curriculum in higher education institutions has become vital with the growing importance of globalisation. Mobility of faculty and students through semester exchange may not always be the solution due to various associated challenges. To address this an innovative method is Collaborative Online International Learning (COIL). In the current paper, the researchers have attempted to study COIL and understand the enablers that contribute to its successful implementation. To achieve this objective, the researchers have followed the steps laid down by the Total Interpretive Structural Modelling (TISM) and Fuzzy Matrice d'impacts croisés multiplication appliquée á un classment (MICMAC) analysis, which is based on extant literature review, reflection of researchers own experiences as well as expert opinion. The findings of the study shows the relation between the identified factors.

INTRODUCTION

Globalisation has impacted various sections of society differently, and higher education institutions are no exception. Today's global community has encouraged higher education institutions to invest in initiatives that provide international exposure to faculty and students (Brandenburg et al. 2019; Appiah-Kubi and Annan 2020). Harari (1989) has significantly contributed to the research on internationalisation in higher education. According to Harari (1989), there are three essential aspects of the international content of the curriculum, cross-country movement, and international technical assistance that are necessary contributors to implementing internationalisation in higher education. Achieving all three may not be possible each time. However, the internationalisation of higher education is vital and paves the way for students to become world citizens embracing diversity and inclusion. Such exposure is essential for students to exchange ideas, communicate and challenge existing perspectives (Banks et al. 2007). Concerns regarding costs, resources, and fear of the unknown are some factors that prevent this exchange (Vajargah and Khoshnoodifar 2013). Therefore, higher education institutions must recognise these challenges and explore options that could be more economical and feasible for all stakeholders (Vajargah and Khoshnoodifar 2013).

Collaborative Online International Learning, popularly referred to as COIL, is an innovative solution to address this problem. COIL enables faculty and students across the globe to connect by leveraging technology (Yates et al. 2021). It is a cost-effective instructional method that promotes intercultural learning. Through COIL, two or more international faculty located in different locations with different time zones can cofacilitate an online international collaboration between their students (Esche 2018; Yates et al. 2021). Thus, without travelling, by staying in one's own country, COIL provides an opportunity for students to connect with students across the globe. It helps students and faculty to build intercultural competencies through participation. Also, it enhances intercultural learning through online interactions with peers (Appiah-Kubi and Annan 2020). COIL is an excellent way of fostering intercultural sensitivity and competence (Junior and Finardi 2018).

The word 'collaborative' is crucial in COIL and indicates a joint effort of all stakeholders.

The joint effort is demonstrated through proper planning, mapping curriculum, finding topics of interest, and building trust and communication between faculty and students of the participating countries (De Wit 2013). The second aspect of COIL is 'online'. COIL relies on technology for collaboration. It is crucial to identify technology that is readily available in the participating countries and provides support to facilitate interactions. Technology aids COIL conduction through either the synchronous or asynchronous mode of delivery (Anzai and Shimizu 2022). The dimension 'international' is an essential step towards globalisation and considers different global dimensions. 'Learning' indicates the knowledge accumulated, experienced, and shared in the process (Misra et al. 2020).

COIL is an effective mechanism to enhance internationalisation in higher education. There are many dimensions and multiple practices in COIL. Researchers in the past have tried to define the practices and dimensions of COIL (Ogbonna et al. 2019). However, to the researchers' knowledge, no studies have attempted to model the enablers of COIL using the Total Interpretative Modelling and Fuzzy MICMAC analysis. The present study is an outcome of the researchers' experience with multiple COIL projects. The study highlights various factors contributing to successful COIL projects by connecting two diverse countries, India and Brazil. The study is significant to academicians and policymakers, as it provides a useful perspective to inculcate internationalisation in the curriculum and policies related to higher education.

Objectives of the Study

Through the study, the researchers have attempted to answer the following research objectives:

O1: To understand the factors enabling the successful implementation of COIL as an integral part of internationalisation in higher education.

O2: To arrive at a model using Total Interpretive Structural Modelling to explain the nature,importance, and interactions within the identified enablers.

To achieve these research objectives, the researchers have started the research with an extant literature review to identify the factors that enable the successful implementation of COIL. The factors were then validated by experts who have relevant experience in COIL. The researchers then followed the steps of the Total Structural Interpretative Modelling to propose a model that highlights the relation between the identified enablers. The findings and discussions of the model are analysed in detail in the concluding section of the paper.

Theoretical Background

Enablers of COIL

This section is significant as it forms the basis of the study. Through the extant literature review, the researchers identified the factors that enable the successful implementation of COIL. Multiple factors contribute to the successful implementation of COIL. The researchers have termed these factors as enablers, and are discussed in the section below.

Technology

Technology plays a significant role in bridging the geographical gap between institutions, faculty, and students (Lai and Bower 2019). Leveraging technology effectively enables institutions to contribute significantly to global education (Nava-Aguirre et al. 2019). According to Appiah-Kubi and Annan (2020), there should be sufficient investment in technology for COIL to be successful. Identifying technology that is accepted and used in the participating countries is essential (Krasulia and Pistor 2021). Internet bandwidth availability is vital for the smooth facilitation of COIL. Platforms that support interactions between the faculty and students, such as Zoom, Microsoft Teams, Google Meet, etc., are essential facilitators that facilitate communication between the faculty and students (Rubin 2017). There should be access to technology that enables students to submit their work after collaborations. These platforms should also enable faculty to review the submissions and provide effective feedback (Naicker et al. 2021). It is also essential to focus on the e-readiness of students to use these platforms. In other words, students should be able to use the available technology with ease

and have access to multiple online tools, such as Canva, WhatsApp, Padlet, etc., that helps keep them engaged (Eskom 2019).

Flexibility

The flexibility of faculty and students is core to the success of COIL. In most cases, participating countries in COIL will have varied course content, teaching pedagogy, and understanding levels (Villar-Onrubia and Rajpal 2016). It is essential to clearly understand the fundamental objective of COIL and be flexible to achieve the set objective. Flexibility among faculty is vital in designing a COIL project to help students collaborate (Jacobs et al. 2021). The course content would be different across the globe, and it is essential to recognise this difference and find a common path that would encourage the students to participate. The time zones in the participating countries could be different. Both the faculty and students should be flexible to collaborate beyond the regular institute hours (Wimpenny et al. 2022). Innovative and flexible curricula and pedagogy to support this curriculum are important driving forces for the internationalisation of higher education through COIL (Khan and Noam 2018). Another important aspect of flexibility is flexibility in language. The language barrier is a significant challenge in the internationalisation of higher education. For COIL to be successful, it is essential to be flexible in language, permit the use of translators, encourage the use of the dictionary and be flexible in listening (Jager et al. 2019). Instructors should offer students the chance to choose various activities to achieve better academic performance (Kumi-Yeboah 2018).

Institutional Culture and Institutional Support

COIL requires investment in technology, training, and committed faculty members. Institutional support is crucial for the success of COIL (Appiah-Kubi and Annan 2020). Institutions should be willing to invest their time and resources in COIL. They should have a support team that helps facilitate the COIL process. Institutional support is essential for providing training to ensure the e-readiness of faculty and students. The institute may have to invest in other forms of training, such as designing the curriculum, sensitivity training, language training, etc. (Asojo et al. 2019). It is crucial to have a culture that encourages international collaboration (Terenzini and Upcraft 1996). For the success of COIL, there should be an articulated institutional commitment toward the internationalisation of higher education. Institutions should provide frameworks that would ease the implementation of COIL. Efforts taken for collaborations should be recognised and appreciated by institutions. A culture should encourage faculty to identify and maintain such collaborations (Breser 2017; Knoth and Kiy 2018).

Cost-effectiveness

One of the significant challenges faced in the internationalisation of higher education, especially in practices that encourage the movement of students and faculty through semester exchange programs, is its cost (Vajargah and Khoshnoodifar 2013). COIL is an effective solution to this problem. Faculty and students involved in COIL do not have to spend on travel, accommodation, and other related expenses (Jie and Pearlman 2018). Cost-effectiveness is a major contributing factor to the success of COIL. Universities can internationalise curricula, advance novel partnerships, and provide international learning opportunities and global competencies to their students in a cost effective manner (Jie and Pearlman 2018). Students and faculty participating in COIL do not have to make financial commitments (Fowler et al. 2014). Affordability is an essential characteristic of COIL. This enables a large number of students to participate and enjoy the benefits of COIL.

Well-designed Projects

In COIL, the faculty involved would be hailing from different geographical institutions. It may be possible that the collaborating faculty may be handling different courses (Appiah-Kubi and Annan 2020). The faculty may also try to co-create a topic of mutual interest (Misra et al. 2020). It is crucial to have a thorough understanding of the project or curriculum in place. The project should be able to integrate core aspects of the curriculum of the participating institutions (Castro et al. 2019). This would help keep the students engaged, as they would be able to relate to the project's relevance. There should also be an em-

phasis on cultural exchange, hence designing a simple project that is easy to comprehend and execute is essential (De Wit et al. 2015). The time frame for the project should also be well-planned. It is essential to consider various cultural aspects while deciding the time frame. For example, important events, festivals, holidays, etc., should be considered. For the collaboration to be successful, considerable thought should be given to these aspects (Nava-Aguirre et al. 2019). It is vital to reduce ambiguity in the COIL project (Naicker et al. 2021). A good structure project will enable students to have more apparent discussions on the topic of interest (Rubin 2017).

Student and Faculty Engagement

The critical objective of COIL is to bring students into a shared common learning space where they are provided with an opportunity to examine and understand multiethnic, multicultural groups' perspectives. This enables them to gain knowledge about the course content and their worldview concerning other students from another country (Castro et al. 2019). However, a vital factor that decides the success rate of this activity is the level of faculty and student engagement. COIL requires planning and delivery of modules in the form of 'collaborative team teaching' and thus requires a commitment of time from the partner institutions' faculty so that they can co-plan guidelines, instructions, curriculum/topics, assessment, etc. (Jie and Pearlman 2018). The entire process is mutual and thus requires both sides' collaboration, cooperation, and faculty engagement. Also, student collaboration and active engagement enhance the students' understanding and may gradually weaken the communication barriers. Active engagement results in more open communication and the exchange of dialogue between students. This impacts the outcome or results directly.

Trust and Open Communication

Ignatiadis et al. (2006) pointed out the importance of trust among members participating in COIL. According to him, a lack of trust will result in members not sharing information. Trust facilitates open communication and information sharing. For COIL, trust among participating members is crucial (Appiah-Kubi and Annan 2020). Trust among participating students from different countries, trust amongst faculty collaborating for COIL, and student-faculty trust is essential for the success of COIL. According to Rubin and Guth (2015), there would be cross-cultural differences in COIL, and the members must trust that their culture will be respected and appreciated. A lack of trust will cause obstructions in the flow of communication and defeat the purpose of cultural exchange (Mudiamu 2020). The language barrier is a challenge associated with different cultures. To reduce the language barrier, it is essential to build trust. Trust helps build faith in an individual's character and within the group (Asgari et al. 2008). This is an essential factor that enables the flow of information and exchange of ideas responsible for COIL's success.

Intrinsic and Extrinsic Motivation

A key driver for the successful implementation of COIL is the motivation among faculty, students, and institutions to participate in COIL. Motivation can be intrinsic motivation or extrinsic motivation (Parker 2003). Intrinsic motivators are personal factors that bring joy to an individual. There are many intrinsic motivators for a faculty member or student to participate in COIL, such as the ability to go beyond geographical boundaries and connect and reach out to students across the globe. Other intrinsic motivators are the chance to make new friends and acquaintances beyond the country, explore new innovative ideas, and intellectual gain (Cook et al. 2009). The extrinsic motivators include rewards and recognition, certificates of appreciation, monetary rewards, etc. (Lechuga and Lechuga 2012). Team dynamics and comfort levels in collaboration are other important motivators contributing to COIL's success. Quite often, the motivating factors for faculty participating in COIL are intrinsic. The faculty and students have to be motivated and involved in the process. They need to be committed to going beyond the regular tasks for COIL to succeed.

Literature Review

As discussed in section 2 of the paper, the researchers conducted an extant literature review

to identify the factors that impact the successful implementation of COIL. The researchers have studied papers published in peer-reviewed journals of repute indexed in Scopus and Web of Science. Researchers have reviewed papers published in JStor, Ebscohost, Taylor and Francis, Springer, etc. Also, studies in India, Brazil, and other countries were conducted to understand COIL globally. The researchers focused on concepts and terminologies that were repetitive and common to the papers. These concepts were identified as significant factors for COIL. To identify the factors that contributed to the success of COIL, the researchers also reflected on their own experiences with COIL. Keywords based on the researchers' experience were searched, which further helped to strengthen the literature review. Table 1a represents the factors identified through the literature review and the key authors contributing to the study area.

Validation through Survey

In order to validate the eight enablers identified through literature review, a survey was administered to a select group of 50 respondents. The criteria for selecting the respondents were at least one-year experience of participation in COIL. The respondents were given a brief meaning of the identified enablers and were asked to "rate the enablers on a scale of 1 to 5" in the growing order of importance based on their personal experience. Cronbach Alpha was calculated to check the reliability of the construct. The value of which was 0.834, which indicated good internal consistency. Further, the mean score and standard deviation was calculated based on the responses, the mean score was greater than 3 was used as the valida-

Table 1a: Enablers identified

Enabler name	*Enabler*	*Source*
E1	Technology	Lai and Bower 2019; Nava-Aguirre et al. 2019; Eskom 2019; Appiah-Kubi and Annan 2020; Krasulia and Pistor 2021; Rubin 2017; Naicker et al. 2021.
E2	Flexibility	Villar-Onrubia and Rajpal 2016; Jacobs et al. 2021; Wimpenny et al. 2022; Khan and Noam 2018; Jager et al 2019; Kumi-Yeboah 2018.
E3	Institutional Culture and Institutional Support	Philip Appiah-Kubi 2020; Asojo et al. 2019; Knoth and Herrling 2017; Breser 2017; Krasulia and Pistor 2021.
E4	Cost-effectiveness	Vajargah and Khoshnoodifar 2013; Jie and Pearlman 2018; Fowler et al. 2014; Knoth and Herrling 2017.
E5	Well-designed Projects	Appiah-Kubi and Annan 2020; Misra et al. 2020; Castro et al. 2019; De Wit et al. 2015; Nava-Aguirre et al. 2019; Naicker et al. 2021; Rubin 2017.
E6	Student and Faculty Engagement	Castro et al. 2019; Jie and Pearlman 2018; Castro et al. 2019; Krasulia and Pistor 2021.
E7	Trust and Open Communication	Roberts 2006; Appiah-Kubi and Annan 2020; Guth and Rubin 2015; Mudiamu 2020; Asgari et al 2008.
E8	Intrinsic and Extrinsic Motivation	Parker 2003; Cook et al. 2009; Lechuga and Lechuga 2012.

Source: Authors contribution

Table 1b: Mean scores of enablers

Code	*Enabler*	*Mean score*	*Standard deviation*
E1	Technology	3.87	0.947
E2	Flexibility	3.44	1.040
E3	Institutional Culture and Institutional Support	3.35	1.153
E4	Cost-effectiveness	3.23	1.112
E5	Well-designed Projects	3.67	1.243
E6	Student and Faculty Engagement	3.75	0.988
E7	Trust and Open Communication	3.25	0.909
E8	Intrinsic and Extrinsic Motivation	3.65	1.040

Source: Authors contribution

tion criteria. Table 1b represents the mean score and standard deviation of the identified enablers.

RESEARCH METHODOLOGY

Data Collection

The steps proposed by Total Interpretative Structural Modelling (TISM) were followed by the researchers. In TISM, data is collected through expert opinion. For the study, it was necessary to include stakeholders who have been associated with COIL and have experienced COIL either as a facilitator, learner, or support team. A key objective of the research was to understand how the identified enablers contributed to the success of COIL and linked to each other. To achieve this objective, the researchers approached faculty who have designed and conducted COIL from India and Brazil. Also, the students who have experienced COIL from India and Brazil were enrolled to share their experiences via a semi-structured questionnaire. Data was collected from 50 such identified experts, of which 12 were faculty from India and Brazil, and 38 were students. India and Brazil have been selected for the study as the findings were based on COIL projects that had the participation of students and faculty from these two countries. As a step to improve the South-South relation, there has been a conscious effort to develop fruitful relations through COIL projects between India and Brazil.

The sampling framework for faculty as experts in TISM was:

- The identified faculty should have been trained in COIL and have participated in COIL.
- The faculty should have been actively involved in at least one COIL project.
- Faculty should have the required experience in designing COIL projects.
- The faculty should have collaborated with a faculty from at least one different country.

Similarly, the sampling framework identified for students as experts for TISM was:

- The student should have participated in at least one COIL project.
- The student should have interacted with students from at least one different country and culture.
- The student should have completed all COIL-related submissions for the project he/she was involved in.

The TISM method is dependent on the opinion of experts. Hence it was imperative to identify the correct experts. Hence this sampling framework was considered. Since the TISM method adopts a qualitative approach to collecting data that requires a thorough understanding of the subject, the sample size was limited to 50 (O'Cathain et al. 2015). The experience and feedback of the experts were captured in the Structural Self Interaction Matrix format as proposed by TISM, who discussed in the next section. Table 2 demonstrates the demographics of the respondents.

Table 2: Respondent demographics

Variable	*Category*	*Respondents*
Age (years)	18-30 years	38
	31-50 years	11
	Above 50 years	01
Gender	Male	22
	Female	28
Designation	Faculty (Indian)	7
	Faculty (Brazil)	5
	Student (Indian)	20
	Student (Brazil)	18

Source: Authors contribution

Total Interpretative Structural Modelling

TISM is derived from the basis of the Interpretive Structural Modeling (ISM) proposed by Warfield in 1973. ISM is an exciting technique that attempts to generate a hierarchical flow between the identified factors. The hierarchical flow helps identify the most critical factor that is crucial for the model's success (Mazdeh et al. 2015). The outcome of the ISM technique is a visual map representing the different levels of hierarchy between the identified factors. In 2012, Sushil reviewed the technique and proposed the TISM that provided a better explanatory framework, and hence, TISM has become a more preferred technique (Behl et al. 2018). The steps in the TISM technique are well-established. It begins with the identification of factors in the study. As discussed in the literature review, there were eight factors termed as enablers that were identified in this study, namely, Technology (E1), Flexibility (E2), Institutional Culture and Institutional Support (E3), Cost-effectiveness (E4), Well-designed Projects (E5), Student and Faculty Engagement (E6), Trust and Open Communication (E7) and

Intrinsic and Extrinsic Motivation (E8). The identified enablers were then translated into a Structural Self Interaction Matrix denoted as v, a, x, o that reflected the relationship between the enablers. Once the SSIM was established, it was translated into a reachability matrix by using binary digits 1 and 0. The reachability matrix helped form the basis for a series of iterations that helped understand the hierarchical levels among the enablers. The levels identified became an integral part of formulating the model.

The following section discusses these steps in detail.

Structural Self-interaction Matrix (SSIM)

Table 3 represents the SSIM. The table shows the relationship between i and j, which are the row and column variables (Sandbhor and Botre 2014). As per the rules of TISM, the relation between enablers was denoted as V, A, X, O, wherein:

- V indicated that I impacts j, but vice versa is not true
- A indicated that j impacts I but vice versa is not true
- X indicated that there is a two-way relation between i and j, and both i and j impact each other.
- O indicated that there was no observable relationship between the identified enablers.

This relation was arrived at through expert opinion during the data collection phase.

Table 3: Structural Self Interaction Matrix (SSIM) based on expert opinion

Enablers	*E8*	*E7*	*E6*	*E5*	*E4*	*E3*	*E2*	*E1*
E1	V	V	X	X	X	A	V	
E2	X	A	X	X	A	A		
E3	V	X	X	V	V			
E4	A	A	O	A				
E5	X	X	X					
E6	A	X						
E7	X							
E8								

Source: Authors

Initial and Final Reachability Matrix

The SSIM is then converted into the initial reachability matrix by using the rules given by ISM. V, A, X, O is converted into binary digit form 1 and 0, which states that "the (i, j) value for V is 1 and (j, i) is 0, for A the (i, j) value is 0 and (j, i) value is 1. For X, both the entries become 1 and for O, both become 0". Table 4 represents the initial reachability matrix derived using this principle.

Table 4: Initial Reachability Matrix

Enablers	*E1*	*E2*	*E3*	*E4*	*E5*	*E6*	*E7*	*E8*
E1	1	1	0	1	1	1	1	1
E2	0	1	0	0	1	1	0	1
E3	1	1	1	1	1	1	1	1
E4	1	1	0	1	0	0	0	0
E5	1	1	0	1	1	1	1	1
E6	1	1	1	0	1	1	1	0
E7	0	1	1	1	1	1	1	1
E8	0	1	0	1	1	1	1	1

Source: Authors

An essential aspect of the TISM is the application of the transitivity principle. The final reachability matrix is represented in Table 5.

Level Partitioning

The reachability and antecedent sets help derive the model's different levels as demonstrated in Table 6 and Table 7.

Based on the level portioning, enablers E5, E6 and E7 have been found to be the most repetitive. Hence they have been identified as Level 1. Well-designed Projects (E5), Student and Faculty Engagement (E6), and Trust and Open Communication (E7) have been identified as Level 1 of the model.

Based on the level portioning, enablers E1, E2, E4, and E8 are the second most repetitive. Hence they have been identified as Level 2, and E3 has been assigned Level 3. Technology (E1), Flexibility (E2), Cost-effectiveness (E4), and Intrinsic and Extrinsic Motivation (E8) are a part of Level 2 of the model. Institutional Culture and Institutional Support (E3) forms Level 3 of the model. Table 8 summarises the enablers of COIL and their levels based on level partitioning

FINDINGS

Globalisation aims to create an economy that is more 'integrated and independent' without obstacles and barriers. The process of globalisation has also impacted the field of education and

Table 5: Final Reachability Matrix

Enablers	*E1*	*E2*	*E3*	*E4*	*E5*	*E6*	*E7*	*E8*	*Driving Power*
E1	1	1	0	1	1	1	1	1	7
E2	0	1	0	0	1	1	0	1	4
E3	1	1	1	1	1	1	1	1	8
E4	1	1	0	1	0	1*	1*	0	5
E5	1	1	0	1	1	1	1	1	7
E6	1	1	1	0	1	1	1	0	6
E7	0	1	1	1	1	1	1	1	7
E8	0	1	0	1	1	1	1	1	6
Dependence power	5	8	3	6	7	8	7	6	

Source: Authors

Table 6: Level partitioning Level 1

Enabler	*Reachability set*	*Antecedent set*	*Intersection*	*Level*
E1	(1,2,4,5,6,7,8)	(1,3,4,5,6)	(1,4,5,6)	
E2	(2,5,6,8)	(1,2,3,4,5,6,7,8)	(2,5,6,8)	
E3	(1,2,3,4,5,6,7,8)	(3,6,7)	(3,6,7)	
E4	(1,2,4,6,7)	(1,3,4,5,7,8)	(1,4,7)	
E5	(1,2,4,5,6,7,8)	(1,2,3,5,6,7,8)	(1,2,5,6,7,8)	Level 1
E6	(1,2,3,5,6,7)	(1,2,3,4,5,6,7,8)	(1,2,3,5,6,7)	Level 1
E7	(2,3,4,5,6,7,8)	(1,3,4,5,6,7,8)	(3,4,5,6,7,8)	Level 1
E8	(2,4,5,6,7,8)	(1,2,3,5,7,8)	(2,5,7,8)	

Source: Authors

Table 7: Level partitioning Level 2

Enabler	*Reachability set*	*Antecedent set*	*Intersection*	*Level*
E1	(1,2,4,5,6,7,8)	(1,3,4)	(1,4)	Level 2
E2	(2,5,6,8)	(1,2,3,4,8)	(2,8)	Level 2
E3	(1,2,3,4,5,6,7,8)	(3)	(3)	Level 3
E4	(1,2,4,6,7)	(1,3,4,8)	(1,4)	Level 2
E8	(2,4,5,6,7,8)	(1,2,3,8)	(2,8)	Level 2

Source: Authors

Table 8: Enabler of COIL and their levels based on level partitioning

Enabler	*Name of the enabler*	*Level*
E1	Technology	Level 2
E2	Flexibility	Level 2
E3	Institutional culture and institutional support	Level 3
E4	Cost-effectiveness	Level 2
E5	Well-designed projects	Level 1
E6	Student and faculty engagement	Level 1
E7	Trust and open communication	Level 1
E8	Intrinsic and extrinsic mtivation	Level 2

Source: Authors

as a result, globalisation of education has become the new normal. Globalisation of education is indeed the need of the hour. In modern society, technology plays a vital role in bridging the gap between people and geographical distances. Also, leveraging technology enables and empowers institutions to contribute to global education. When used effectively and efficiently, technology acts as an enabler and contributes to the student's learning experience. Through the study, the researchers have identified eight enablers that would enable higher educational institutions to engage with internationalisation through COIL. Flexibility, Institutional Support and Culture and Well-designed Projects are the linkage factors in the model.

The researchers tried identifying the enablers contributing to COIL's successful implementation in higher education institutions. The study had

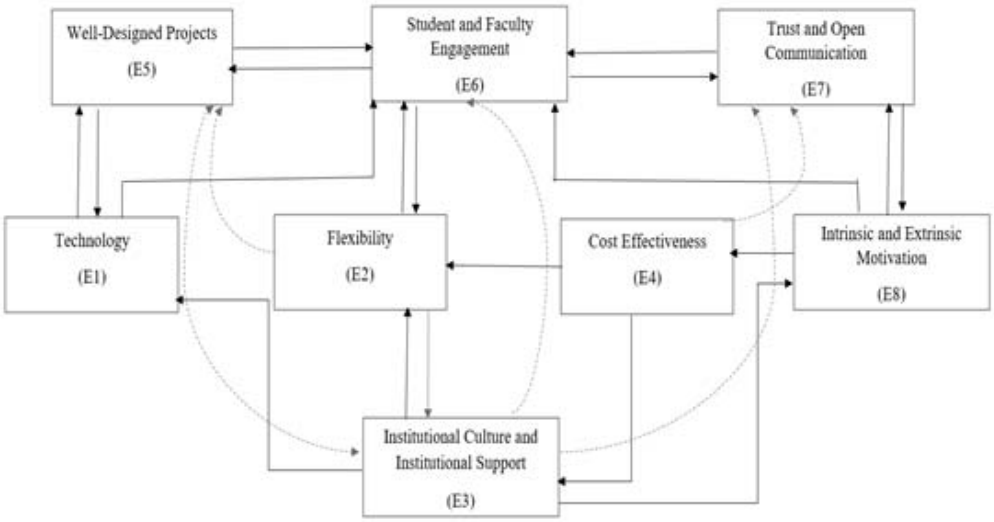

Fig. 1. TISM Model on enablers to the successful implementation of COIL in higher education institutions
Source: Authors

three significant steps that helped the researchers arrive at the model, as shown in Figure 1. The first stage represented the literature review that helped the researchers to arrive at the eight identified enablers. In the next phase, data were collected from experts with COIL experience. The opinion was interpreted and placed in the templates provided by TISM. The study's findings are discussed in two sections, the first is the model based on TISM (Fig. 1), and the second is the fuzzy MICMAC analysis that helps classify the enablers (Fig. 2).

DISCUSSION

TISM Model on Enablers to the Successful Implementation of COIL in Higher Education Institutions

Figure 1 represents the TISM Model on enablers to successfully implement COIL in higher education institutions. The model shows that well-designed projects, student and faculty engagement, trust and open communication are a part of Level 1 of the model. These are essential enablers, and higher education institutions should focus on these enablers to implement COIL successfully. Projects should be simple and comprehensive. There should be no scope for ambiguity. Language is vital while designing the project, it should be kept simple, and jargon should be avoided. The project should mention the timelines to be followed. This will enable both the facilitators and students to be aware of the expected outcome (Castro et al. 2019). For COIL's success, faculty and students' engagement and commitment are a must. Levels of engagement and commitment can be maintained through open communication. Participating faculty and students would be from diverse cultures. Hence it is crucial to build trust among the participating members (Mudiamu 2020).

Technology, flexibility, cost-effectiveness and motivation form a part of Level 2 of the model. These factors have a close relation with level 1 of the model. According to Appiah-Kubi and Annan (2020), "COIL requires investment in technology and for participants who are comfortable with online communication technologies supported by various colleges through their distance or e-learning facilities". In other words, technology, as well as students' self-efficacy toward using technology, plays a massive role in the success of COIL. Technology is the backbone for smooth implementation of COIL. Technology enables one

to overcome the mobility challenge and overcome the expenses associated with it. Access to technology is essential for COIL (Krasulia and Pistor 2021). The course content would be different across the globe, and it is vital to recognise this difference and find a common path that would encourage the students to participate. The time zones in the participating countries could be different. Both the faculty and students should be flexible to collaborate beyond the regular institute hours (Wimpenny et al. 2022). Technology should be leveraged to achieve flexibility. Technology also enables cost effectiveness, which is a defining parameter for COIL, which is an inexpensive solution for internationalisation. A key driver for the successful implementation of COIL is the motivation among faculty, students, and institutions to participate in COIL. This motivation also helps to keep the faculty and students engaged in achieving the learning outcomes.

Institutional support and culture, which forms a part of level 3 of the model, work in the background for the successful implementation of COIL. It is vital to have an institutional culture that supports and appreciates internationalisation (Knoth and Herrling 2017). It is important to have COIL as a part of the strategic plan and goals of the institute. This would be possible only through institutional support and investment in COIL.

Fuzzy MICMAC (Matrice D'impacts Croisés Multiplication Appliqué à UN Classement) Analysis

The MICMAC analysis is derived from the reachability matrix. It helps classify the enablers into four categories depending on the driving and dependence powers of the enablers. A drawback of the traditional MICMAC analysis was the use of only binary digits 1 and 0. This limitation was overcome by using Fuzzy MICMAC analysis, which helped to define a scale (Table 9) that enabled a better interpretation of expert opinion (Kandasamy et al. 2007).

Table 10 represents the expert opinion based on the associability of values provided. The fuzzy MICMAC Analysis helps categorise the variables identified into four categories based on their driving and dependence power, that is, Autonomous, Driver, Dependent and Linkage.

The fuzzy MICMAC analysis shown in Figure 2 is discussed as follows.

1st Cluster

The variables that fall under this cluster are called autonomous variables and are characterised as variables with weak dependence and driving power. In the model, Cost Effectiveness (E4) has been identified as an autonomous factor.

Table 9: Associability of values

Associability	*No*	*Very low*	*Low*	*Medium*	*High*	*Very high*	*Complete*
Value	0	0.1	0.3	0.5	0.7	0.9	1

Source: Authors

Table 10: Fuzzy reachability matrix for enablers for successful implementation of COIL

Enablers	*E1*	*E2*	*E3*	*E4*	*E5*	*E6*	*E7*	*E8*	*Driving power*
E1	0	0.9	0.3	0.7	0.7	0.9	0.5	0.7	4.7
E2	0.5	0	0.5	0.1	0.7	0.5	0.7	0.9	3.9
E3	0.3	0.5	0	0.7	0.9	0.5	0.5	0.3	3.7
E4	0.5	0.7	0.5	0	0.3	0	0.1	0.5	2.6
E5	0.7	0.7	0.9	0.5	0	0.5	0.3	0.7	4.3
E6	0.3	0.9	0.7	0	0.5	0	0.9	0.5	3.8
E7	0.7	0.7	0.5	0.7	0.9	0.5	0	0.3	4.3
E8	0.5	0.7	0.3	0.7	0.5	0.9	0.7	0	4.3
Dependence power	3.5	5.1	3.7	3.4	4.5	3.8	3.7	3.9	

Source: Authors

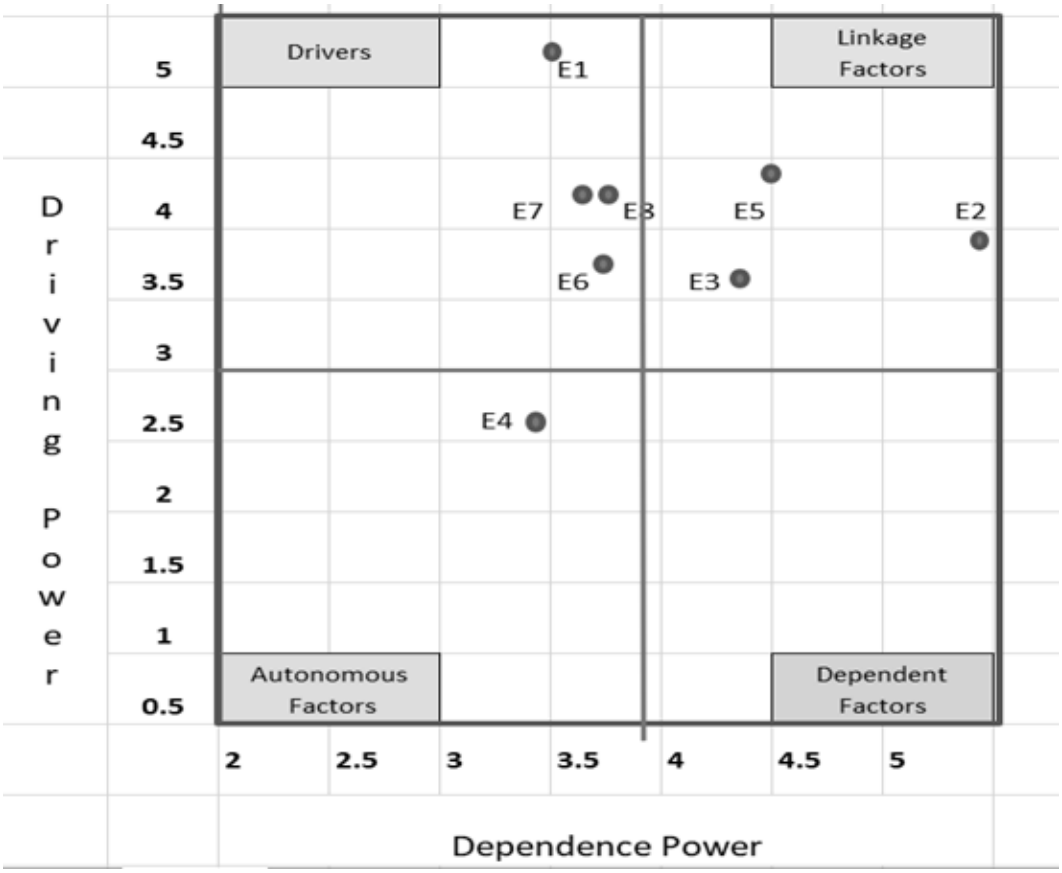

Fig. 2. Fuzzy MICMAC Analysis of the enablers of COIL
Source: Authors

2nd Cluster

This cluster is known as the dependence cluster. The factors in this cluster are defined as strong dependence power and weak driving power. There are no dependent factors in the model of study.

3rd Cluster

Factors in this cluster are called the linkage factors. These factors are characterised by strong driving and strong dependence powers. These are the most critical factors in the model. Flexibility (E2), Institutional Support and Culture (E3), and Well-designed Projects (E5) are the linkage factors in the model.

4th Cluster

This cluster is called the driver of the model. These factors have very high driving power and drive other variables and should hold significance in the model. Technology (E1), Student and Faculty Engagement (E6), Trust and Open Communication (E7), and Motivation (E8) are the drivers of the model.

CONCLUSION

It is important for higher education institutions to focus on these linkage factors. Flexibility of time, location for both students and faculty is crucial. Well-designed COIL projects that have

clear learning outcomes that are communicated to students help avoid gaps in the perception between students from participating countries. A good institutional culture that provides support for training faculty, provide incentives to motivate faculty as well as provide the required infrastructure set up is important to promote initiatives for COIL. Technology, Student and Faculty Engagement, Trust and Open Communication and Motivation are the drivers that lead to the success of COIL. There has been a lot of discussion on the importance of technology as a backbone of COIL, and it is important to identify technology that is easily available and accessible to the participating countries. Technology should be user friendly and should be able to facilitate the process without causing anxiety among the participants of COIL. Motivation from all participants help keep the participants engaged and benefit from COIL. It is important for higher education institutions to focus on these aspects.

RECOMMENDATIONS

The TISM-based model in this paper provides a very realistic representation of the enablers for the successful implementation of COIL. The model can help academicians and practitioners understand the hierarchy of actions to be taken. Based on the literature review and expert opinion, eight enablers were identified. They are technology, student and faculty engagement, trust and open communication, well-designed projects, flexibility, cost-effectiveness, intrinsic and extrinsic motivation, and institutional culture and support. The model helps in understanding the relative importance and interdependence of these enablers.

The fuzzy MICMAC analysis indicates the category of enablers, which needs attention according to their driving and dependence power. Faculty should concentrate on those enablers, which have higher driving power. These enablers should be emphasised for successful and effective COIL implementation. These higher driving enablers are the source for other enablers, which have higher dependence. Cost effectiveness appears as an autonomous variable, which means it does not have much influence on other variables of the system. The cost aspect is important for institutions and administration, as they are very cost conscious and sensitive about expenditures. From the point of view of faculty and students, cost effectiveness is not of prime importance, the exposure and experience is what they value more. Flexibility, institutional support and well-designed projects have strong driving power as well as strong dependence. These are linkage factors, can create instability and any change will have effect on others and also a feedback on themselves. Technology, student and faculty engagement, trust and open communication and motivation are independent variables having great driving power. These need maximum attention as they affect all other variables and need great attention for successful implementation of COIL.

MANAGERIAL IMPLICATIONS

The study has profound implications for academicians, policymakers, and representatives from the international cell in educational institutes across the globe. Focusing on the identified factors will help intuitions embrace COIL and help students benefit from the collaboration. There has been an increasing curiosity among universities and higher education institutions to identify opportunities to participate in COIL, and this has resulted in excitement as well as anxiety. The study provides a clearer understanding of the factors that drive COIL, the study also highlights the researchers own experiences that have resulted in successful COIL projects. These insights are useful for academicians, policymakers, and representatives from the international cell in educational institutes to take steps towards COIL and embrace internationalisation.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The researchers have followed the TISM methodology in the study. One of the drawbacks of TISM is that it is based on the experiences of experts and expert opinions. Sometimes, there could be a tendency of biasness, which cannot be completely ignored. The study was based on experiences in two countries, Brazil and India. The study can be further conducted considering the experiences of faculty from other countries as well. The derived model can be further validated using statistical techniques.

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