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A Case Study: Deploying a First-Year Engineering Course at a Sino-U.S. Joint Program Abroad

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ABSTRACT

A joint mechanical engineering program was established between a large R1 U.S. public university and a renowned public university in China to collaboratively educate the next generation of global engineers. The U.S. institution's curriculum was implemented at the partner university, with all courses taught in English. Qualified students can matriculate at the U.S. university during their senior year, as a source of international talent recruitment. As required by the Ministry of Education in China, one-third of the courses from a joint program must be taught by faculty from the U.S. institution. Among these, a project-based lower division technical elective course was collaboratively adapted as a first-year requirement for all students in the joint program to enhance the existing curriculum with experiential learning.

The two-term course, offered to lower division U.S. students, allowed participants to design, build and test engineering projects and obtain technical experiences such as computer aided design (CAD), basic and advanced manufacturing, electrical fabrication, etc. In addition, technical written and verbal communication skills were incorporated through presentations and design reports. Post-pandemic, U.S. faculty taught the course in person at the joint program. Due to the different academic systems, the course format and credit hours were adjusted to meet the partner university's requirements while retaining all learning outcomes such as understanding the engineering design process, developing CAD and manufacturing skills, and teamwork.

Course implementation was assessed with end-of-term student surveys regarding students' experience in the course and their ability to obtain critical engineering skills. A comparison study was performed with student survey results collected from the equivalent course offered at the U.S. campus as a baseline. Despite differences in education systems and cultural backgrounds, results showed successful course deployment in China, with an average of 94% of the students achieving the expected learning outcomes. Project-based experiential learning courses show great promise to impact students internationally.

Introduction

Academic programs designed to support increased collaboration with institutions abroad are proposed to assist in helping with advancing global education. These programs are designed in different formats, including faculty-led collaborations, institutional partnerships, branch campuses, etc. [1, 2, 3, 4]. Among aforementioned formats, institutional partnerships are a collaborative effort between two institutions/departments to jointly develop a long-term program abroad to emulate successful programs at the home institutions [2, 5]. One benefit of these programs is allowing students to be educated by faculty members from abroad in a cohesive program designed for international students. Additionally, many of these programs allow students to visit or study at the program's home institution, allowing for an improved experience. Students and faculty who are involved in these programs have gained a global perspective, self-efficacy, and cultural competency [6].

While there are many benefits to developing an academic program abroad, multiple challenges exist in the development. Some challenges include legal, financial and cultural barriers. For example, many countries that have large populations of students who would benefit from such academic programs face challenges in the implementation due to travel regulations or proposed national security risks [3]. Additionally, funding can be an obstacle for implementing programs abroad especially in regions where students lack financial resources, requiring a large amount of support from the host institution or finding external partners to sustain the program [3]. Finally, challenges may exist due to differences in culture, which may include different goals, values, or social norms that may exist in the country, which can cause difficulties in the development and academic teaching of the coursework [3, 7].

Understanding existing challenges, an academic partnership was established between a public R1 institution located in the United States and a renowned public university in China to enhance global outreach and reputation. The collaboration established abroad was an undergraduate joint program in mechanical engineering, hosted at the partner's campus in China for financial affordability and utilizing existing infrastructure for local students. Per policy from the Chinese Ministry of Education, joint programs are required to have at least one-third of the core courses to be taught by faculty from the U.S. institution. Among these one-third courses, the joint program includes a required first-year technical elective where students are required to design, build and test an engineering prototype in a semester-long course which was developed based on a similar project-based course at the U.S. institution [8-9]. This paper examines the implementation of this undergraduate engineering course in two different cultural contexts by comparing its delivery at a U.S. university and its counterpart abroad. The study aims to evaluate the impact of varying cultural backgrounds and academic/social norms on course implementation. Both qualitative and quantitative data are presented to assess student learning outcomes. As globalized curricula become increasingly prevalent, this implementation serves as a case study for international educators, demonstrating successful collaboration between U.S. and Chinese universities in teaching an undergraduate engineering course.

Research Setting

This technical elective course was initially developed and implemented at a large public university in the U.S. as a two-term lower-division multidisciplinary experiential learning course where students design, build and test engineering projects in teams [8]. The course consisted of both lecture and lab session where students learned relevant project topics, computer-aided design (CAD), and basic fabrication and manufacturing processes in the first term. In the second term, the course expands to autonomous devices through microcontrollers, sensors and actuators while introducing additive manufacturing and laser cutting. The lectures were offered in a hybrid format allowing students to enroll in either an online or an in-person session due to over-enrollment. All lab sessions were implemented in-person to support students to develop technical skills related to the course. The students worked in teams of 5-7 students in lab sessions supervised by a graduate teaching assistant and an undergraduate assistant. Attendance was not required for lecture, but required for lab sessions. Lectures were recorded and made available to students. The class was open to all engineering majors and undeclared students who were interested in potentially majoring in engineering. The class had no prerequisites, and it served as an option for students' technical elective degree requirement.

When the course was implemented overseas, the class size was limited to a cohort of up to 60 students due to admission policy at the partner institution. Additionally, the course contents and teaching pedagogy followed the curriculum from the U.S. university, and the entire course was taught in English. The course duration remained the same as the U.S. setting, which it had to use one semester plus a short summer term to satisfy the time equivalency. The setup was similar to the U.S. setting in that there were one to two lectures a week, and one two-hour lab session per week. The lectures and lab sessions for the course were both conducted in person only and student attendance was mandatory for the first term. Due to the utilization of summer term at the partner institute, the attendance was not mandatory during the second term with slides and recorded instruction videos uploaded to the course website for students who could not attend or wanted to review the materials. Students work in teams of 6 during lab sessions.

Due to the different academic systems, the Chinese university does not provide teaching assistants for the courses. To assist the U.S. instructors in lab sessions, grading assignments, and other needs requested by the U.S. instructors, one or two peer faculty were provided for each course. Lectures were offered to all 60 students in person, and two lab sessions were offered with 30 students in each lab session in person, instructed by the U.S. faculty solely, or in collaboration with peer faculty. Similar to the U.S. education custom, instructors from the U.S. university held office hours to support student learning. Additionally, open lab sessions were available for the students to schedule at their convenience to work the team projects, as shown in Figure 1. 3D printing and laser cut were provided during the second term for the students to build a project. On average, each team dedicated about 10 hours per week during open lab sessions to complete their projects. This includes fabrication, coding, testing, troubleshooting, preparing slides for presentations, and preparing the project portfolio. Lastly, instead of a technical elective, the course was arranged as a degree-required course in the study plan for students who were enrolled in the joint program at the partner university.

Figure 1. Students working in teams during lab sessions at the joint program hosted by the partner university.

For each institution, a student survey was administered for assessment at the end of each academic term, notated as T1 and T2 respectively. The student enrollment and number of survey responses are tabulated in Table 1 below for the two programs for the 2023-2024 academic year.

	Number of Students (Response Rate)	
Location	**T1**	**T2**
U.S. Institution	357 (84.9%)	334 (87.1%)
Overseas Institution	60 (96.7%)	60 (65.0%)

Table 1. Course Enrollment and Survey Response Rate

Methodology

The surveys are designed to assess the motivation and success of the students abroad at the partner institution in comparison to the students at the U.S. institution as a baseline. To gain a better understanding on the implementation and impact of the course abroad, the following research questions were assessed:

1. Did the project-based experiential learning course achieve student learning outcomes in its implementation abroad, using the U.S. class setting as a baseline?
2. What are similarities and differences in student responses toward course resources from the U.S. institution and the Chinese institution?
3. Did the project-based learning format exert a positive impact on students abroad in student motivation and teamwork despite the exam-based academic culture?

To measure the students' self-perceived achievement of the course learning outcomes, students were asked to rate their confidence level. Students in the course were expected to develop a variety of engineering skills through the development of their projects in areas including the use of computer-aided design (CAD) software, basic design and fabrication knowledge, using a microcontroller, etc. We asked the students to rate their ability for the following skills on a scale of 1 to 5, where 1 is "very unconfident", 2 is “unconfident”, 3 is "somewhat confident”, 4 is “confident” and 5 is "very confident", at T1 and T2.

- Ability to design and fabricate a device
- Ability to use CAD (SolidWorks)

- Ability to implement the design process
- Ability to program microcontrollers (second term only)
- Understanding of Gantt chart and time management
- Ability to complete an interdisciplinary project

Students were asked to share the value they placed on different course resources and features to their learning. The different course resources were assessed on a scale of 1 to 5, where 1 is "very unimportant to my learning”, 2 is "unimportant to my learning", 3 is "somewhat important to my learning", 4 is "important to my learning", and 5 is "very important to my learning". The following course resources were listed in the survey.

When thinking about the course, how important were the following features to your learning?

- Lecture
- Lecture PDF slides
- Homework assignments
- Office hours
- Lab sessions

To assess whether the project-based learning course had a positive effect on students abroad in student motivation and teamwork, the following statements were used to assess student motivation at T1-T2. Students' responses were recorded on a scale from 1 to 5, where 1 is “does not describe me”, 2 is “describes me slightly well”, 3 is “describes me moderately well”, 4 is “describes me very well”, and 5 is “describes me extremely well”.

- I will be/was able to master the skills taught in this course
- I will be able to/was certain I could figure out how to learn even the most difficult course material
- I will be able to/could do almost all the work in this class if I didn't give up

To better understand how the students viewed working in groups we asked students to rate the extent they agree with the following questions regarding their participation as a member of the group project. The questions focused on team strategies such as leadership, communication and group regulation. The students were asked to rate their agreement with the following statements on a scale of 1 to 7, where 1 is "strongly disagree", 2 is “disagree”, 3 is "somewhat disagree”, 4 is “neither agree nor disagree”, 5 is "somewhat agree", 6 is "agree", and 7 is "strongly agree".

- I felt a strong sense of ownership and responsibility when working on our group project
- When my team members were not putting in their work, I tended to complete their tasks
- I completed my assigned tasks when working on our group project
- I enjoyed working on our group project
- I was quick to communicate with my group when problems arose
- I went out of my way to ensure that my group got along

The statistical analysis measured the difference between the student experiences from the U.S. and the partner institution during the 2023-2024 academic year through the Student’s *t*-test for evaluation.

Results and Discussion

Research Question 1: Student learning outcomes in the course implementation abroad

All student teams at the overseas and U.S. universities were able to successfully complete their project at the end of each term with a project competition held among students at its location respectively. The completion of the course project allowed students to demonstrate their knowledge and understanding of the course materials along with gaining valuable experience working in a team environment.

As shown in Figure 2, the course implemented abroad overall achieved the expected student learning outcomes. Given that most students had minimal experiences with engineering skills such as CAD and hands-on fabrication prior to the course, students abroad on average felt confident in the six categories of learning outcomes assessed. Furthermore, T2 exhibited a higher mean than T1 for all six outcomes as students had more time to practice their learning from the first term.

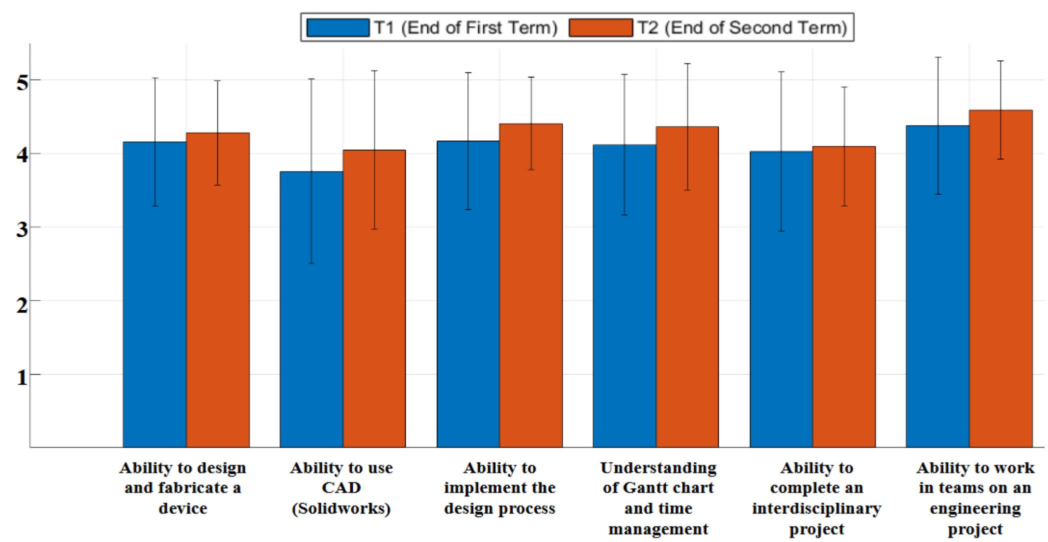

Figure 2. The overseas cohort of students' perceived confidence in the learning outcomes for the course at the end of the first term (T1) and the end of the second term (T2).

In addition, the student survey results from the U.S. institution were used as a baseline to assess whether the course abroad exhibited similar success on learning outcomes. Table 2 shows that students from both institutions self-assessed that they felt on average confident in being able to accomplish the course learning goals. The learning outcome that the students felt most confident about at both institutions was the ability to work in teams on an engineering project. Similarly, both cohorts indicated within the survey responses that their confidence in the ability to use CAD was the lowest rating among all the learning objectives.

The three learning outcomes that had statistical significance in the difference ($p<0.05$) are: the “ability to use CAD," the “ability to design and fabricate a device,” and the “ability to complete an interdisciplinary project” between the two student cohorts. It is noted that students abroad felt more confident in their ability to design and fabricate a device in both terms ($p=0.04$ for the first term, and $p=0.03$ for the second term), and their ability to use CAD during the second term ($p=0.04$). In contrast, students from the home university indicated that they were more confident in their ability to work on an interdisciplinary project when compared to their overseas counterparts (p-value of 0.04).

This difference may be attributed to the composition of the student groups: the overseas program consisted solely of mechanical engineering students, while the U.S. institution's program included students from ten different engineering majors. Students at the overseas institution were able to better connect with the learning objectives of the “ability to use CAD" and the “ability to design and fabricate a device,” as these were often required skills of mechanical engineering students. Therefore, students abroad possibly perceived such training as more important to their intended program in comparison to the U.S. students with majors such as chemical or electrical engineering which typically did not require the use of CAD. This disparity in perceived relevance could potentially cause the U.S. students to lose motivation in learning a skill not applicable to their future career goals.

Regarding the ability to complete an interdisciplinary project, the U.S. institute offered multiple projects during the second term to accommodate different majors, all while maintaining a focus on engineering design. Students at the U.S. institution reported feeling more confident in their ability to complete interdisciplinary projects, as they had the opportunity to work with peers across various engineering disciplines. In contrast, students abroad all majored in mechanical engineering, which limited their exposure to other specialties. While the projects at both universities were interdisciplinary in nature requiring knowledge of structural design, CAD, and basic electronics, students at the U.S. institution had the opportunity to experience working with engineers in other disciplines which provided them with further insight into an interdisciplinary project-based experience.

Overall, an average of 94% of the oversea students reported perceived learning outcomes at least at a level of being somewhat confident (3 on the Likert scale), and an average of 82% reported being confident in all learning outcomes (4 on the Likert scale). The student self-perceived assessment demonstrated the successful implementation of the experiential learning course abroad.

		Ability to design and fabricate a device		Ability to use CAD (Solidworks)		Ability to implement the design process	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	3.90 ± 0.86	0.04	3.71 ± 1.03	0.73	4.17 ± 0.83	0.96
	Overseas Institution	4.16 ± 0.87		3.76 ± 1.25		4.17 ± 0.93	
T2	U.S. Institution	3.98 ± 0.86	0.03	3.65 ± 1.12	0.04	4.17 ± 0.79	0.07
	Overseas Institution	4.28 ± 0.71		4.05 ± 1.08		4.41 ± 0.63	

		Understanding of Gantt chart and time management		Ability to complete an interdisciplinary project		Ability to work in teams on an engineering project	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	4.03 ± 0.99	0.53	4.26 ± 0.85	0.08	4.50 ± 0.73	0.27
	Overseas Institution	4.12 ± 0.95		4.03 ± 1.08		4.38 ± 0.93	
T2	U.S. Institution	4.34 ± 0.80	0.90	4.37 ± 0.74	0.04	4.57 ± 0.65	0.83
	Overseas Institution	4.36 ± 0.86		4.10 ± 0.81		4.59 ± 0.67	

Table 2. Comparison of student perceived learning outcomes of engineering skills from the course implementation at home and partner institute respectively. 302 and 291 students participated in the survey at home institution T1 and T2 respectively. 58 and 39 students participated in the survey at the partner institution abroad at the end of each term (T1 and T2) respectively. The highlighted values indicate $p<0.05$, with yellow exhibiting a significantly higher mean at the partner university, and blue exhibiting a significantly higher mean at the U.S. institution.

Research Question 2: Similarities and differences between the student responses at both institutions toward course resources.

Both cohorts at the U.S. and overseas institutions utilized various course resources to assist their learning with all learning resources rated on average of at least “somewhat important to learning” (3 on the Likert scale), as displayed in Table 3. The only exception was the views on importance of lectures at the U.S. institution which had an average rating of 2.95 with a standard deviation of 1.13, which students rated lectures to be much less effective post-pandemic in the U.S. for this specific course.

Students at the U.S. and overseas locations showed statistically significant differences in the average rating of importance for multiple learning resources based on *t*-test. For the lecture (attending lectures), lecture files, office hours and project related items (e.g., project specifications, tutorials related to project, etc.), students in the overseas institution reported a substantially higher level of importance to their learning than the students at the U.S. institution ($p<0.001$). Additionally, significant differences were found in the levels of importance to students for the homework as a course resource ($p<0.05$ in the first term, and $p<0.01$ in the second term). In contrast, it is noted that the in-person lab session was the only learning resource which was considered to be statistically significantly more important to the students in the U.S. than the overseas institution.

		Lecture Files		Project Related Items		Homework	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	3.53 ± 1.05	<0.001	4.36 ± 0.73	0.746	3.40 ± 1.04	0.026
	Overseas Institution	4.22 ± 1.03		4.33 ± 0.90		3.74 ± 1.12	
T2	U.S. Institution	3.81 ± 1.02	<0.001	3.60 ± 1.05	<0.001	3.58 ± 1.00	0.002
	Overseas Institution	4.51 ± 0.75		4.28 ± 0.68		4.11 ± 0.88	

		Office Hours		Lab Sessions		Lecture	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	3.48 ± 1.20	<0.001	4.73 ± 0.54	<0.001	2.95 ± 1.13	<0.001
	Overseas Institution	4.05 ± 0.99		4.36 ± 1.01		4.05 ± 1.07	
T2	U.S. Institution	3.69 ± 1.08	<0.001	4.78 ± 0.55	0.020	3.00 ± 1.17	<0.001
	Overseas Institution	4.29 ± 0.79		4.55 ± 0.71		4.33 ± 0.69	

Table 3: Comparison of course resources and features that are important to students at the U.S. and overseas institutions. The highlighted values indicate p<0.05, with yellow exhibiting a significantly higher mean at the partner university, and blue exhibiting a significantly higher mean at the U.S. institution.

By examining the similarities and differences between the students at the two institutions, we gained a better understanding of how students learned at each university respectively and how different academic systems affected student learning. For example, students at the partner university valued lecture and lecture materials much more than the U.S. students, which could be due to several reasons. Firstly, the student number was only 60, which was very small compared with the hundreds of students in the U.S. classroom setting. Also, Chinese universities used a cohort-based/community-based educational model in which all students enrolled in almost identical courses and lived together on campus. A peer community was easily fostered, and not attending courses would receive peer pressure which resulted in a higher participation rate in lecture. Lastly, lecture participation was required for the first term and sign-in sheets were used in each lecture session. To ensure a high learning outcome, the Chinese University assigned a supervisor to visit the classroom and monitor student participation rate occasionally, which gradually formed a social norm that students would not miss classes. For students in the U.S. institution, lecture attendance was not required but encouraged, and lectures were also posted as recorded lectures which allowed students to watch them at their convenience.

Office hours were also rated to be more important at the overseas institution rather than the U.S. institution. Due to the requirement of the courses taught in English at the joint program, some students at the overseas institution had difficulty understanding the course content. Having access to office hours allowed for an opportunity to better understand the materials due to the language barrier, which many students overseas utilized as a learning resource.

Homework was also valued differently at the two institutions. The students at the overseas institution rated homework to be at a higher level of importance than the students at the U.S. institution. This may be explained through the difference in the structure of the homework assignments. At the U.S. institution, the assignments focused more on traditional numerical based physics problems, while the faculty at the overseas institution modified the homework assignments during the first term to be more reflective of the product development process in industry where students were required to present including a project kick-off, design review, progress reports, etc. The purpose was for students to get a more applicable experience of how a product would be developed as a team effort in industry. The students abroad might have found this approach more meaningful than completing traditional assignments as a preview of what an engineer would do in a company.

Finally, the only course resource rated higher by students at the U.S. institution was the in-person lab sessions. This preference might be attributed to U.S. students' greater familiarity with in-person group and hands-on learning, as in general view they are often more exposed to this method throughout their K-12 education compared to students at the overseas institution. The difference was highly significant at the end of the first term ($p<0.001$), while this difference reduced at the end of the second term ($p<0.05$). This change could be attributed to the overseas students' growing appreciation for the utility of hands-on, lab-based learning as they progress through the course.

Research Question 3: Impact of project-based learning on motivation and teamwork for students abroad in an exam-based academic culture?

To assess the impact of potentially unfamiliar teaching methods on students at the overseas institution, students were assessed with survey questions about motivation at the end of each term. The results as shown in Table 4 suggested that the students at the overseas institution were highly motivated throughout the course, which included engaging in substantial individual work, persisting through challenges, and feeling successful in mastering the course materials. Notably, the overseas students expressed stronger agreement with these statements compared to their U.S. counterparts, with the differences being statistically significant.

		I was able to master the skills taught in this course		I was certain I could figure out how to learn even the most difficult course material		I could do almost all the work in this class if I didn't give up	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	3.60 ± 0.85	<0.001	3.74 ± 1.03	0.040	4.03 ± 0.95	0.340
	Overseas Institution	4.14 ± 0.88		4.03 ± 0.79		4.16 ± 0.89	
T2	U.S. Institution	3.52 ± 0.93	<0.001	3.65 ± 1.12	0.034	3.92 ± 1.02	0.567
	Overseas Institution	4.23 ± 0.92		4.05 ± 0.96		4.03 ± 1.12	

		I feel very motivated by this project		I did a lot of individual research on the project	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	3.90 ± 1.01	<0.001	3.52 ± 1.04	<0.001
	Overseas Institution	4.41 ± 0.89		4.05 ± 0.99	
T2	U.S. Institution	3.81 ± 1.03	<0.001	3.41 ± 1.07	<0.001
	Overseas Institution	4.41 ± 0.87		4.13 ± 0.97	

Table 4: Comparison of the student motivation for the two cohorts. The highlighted values in yellow indicate $p<0.05$, demonstrating a significantly higher mean at the partner university.

		I feel a strong sense of ownership and responsibility when working on a group project		When my team members are not putting in their work, I tend to complete their tasks		I complete my assigned tasks when working on group projects	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	5.92 ± 1.03	0.005	4.89 ± 1.51	0.167	6.41 ± 0.73	0.185
	Overseas Institution	6.33 ± 0.95		5.19 ± 1.41		6.55 ± 0.81	
T2	U.S. Institution	5.97 ± 1.06	0.031	5.06 ± 1.41	0.048	6.42 ± 0.73	0.621
	Overseas Institution	6.36 ± 1.12		5.54 ± 1.34		6.49 ± 1.03	

		I enjoy working on group projects		I am quick to communicate with my group when problems arise		I go out of my way to ensure that my group gets along	
Time	Location	Mean ± STD	p-value	Mean ± STD	p-value	Mean ± STD	p-value
T1	U.S. Institution	5.94 ± 1.20	0.032	6.07 ± 1.04	0.016	5.47 ± 1.29	<0.001
	Overseas Institution	6.31 ± 1.15		6.41 ± 0.79		6.14 ± 1.07	
T2	U.S. Institution	6.03 ± 1.16	0.156	6.13 ± 0.96	0.046	5.47 ± 1.54	0.001
	Overseas Institution	6.31 ± 0.94		6.46 ± 0.90		6.18 ± 0.98	

Table 5: A comparison of student views on group project work. The highlighted values indicate $p<0.05$, with yellow indicating a significantly higher mean at the partner university.

Lastly, students were assessed with statements related to working on a group project. As shown in Table 5, students responded very positively to the group aspect of the course and had a high level of agreement with the given statements. Interestingly, in many cases, their responses reflected a stronger sense of teamwork than their U.S. counterparts ($p<0.05$). This positive reception to team-based learning among the overseas students was particularly significant given their limited prior exposure to such teaching methods.

The findings suggest that despite the relative unfamiliarity of group projects in their educational experience, these oversea students quickly adapted to and embraced collaborative work showing that they had a strong sense of teamwork and motivation within the project in comparison, and in many cases, higher than their U.S. counterparts. In addition, many students expressed their appreciation for this new teaching approach at the end of the student survey, which was significantly different from their traditional classroom based learning. This positive response to the team-based learning may explain the substantial impact on students' motivation to succeed in the course.

Conclusion

In summary, this paper presents a successful case study of a first-year project-based experiential learning course implemented overseas. The course, based on a successful model from a U.S. institution, was adapted for an international joint program. We discussed the course's implementation and its success despite differences in academic systems, traditional learning styles, and cultural backgrounds. The students abroad not only completed their projects successfully but also met the course objectives at levels comparable to, and in some cases exceeding, those of students at the U.S. institution. Moreover, the course had a positive impact by exposing overseas students to an unfamiliar learning environment. This exposure resulted in high motivation levels and the development of fundamental group-based work skills. To enhance future student experiences based on feedback at the partnership university, the course instructors intend to add learning modules on project management tools due to lack of such exposure in the K-12 education system. Due to the success of this implementation, the course has been adopted as a base model for project-based learning at other schools within the partner university.

References

[1] G. Zheng and Y. Yang, "A Successful Joint Venture for International Engineering Education," 2017 ASEE Annual Conference & Exposition, June 2017, doi: https://doi.org/10.18260/1-2--27519.

[2] A. Fekadu et al., "Towards effective and sustainable global academic partnerships through a maturity model informed by the capability approach," Globalization and Health, vol. 17, no. 1, Nov. 2021, doi: https://doi.org/10.1186/s12992-021-00785-2.

[3] M. Escriva-Beltran, J. Muñoz-de-Prat, and C. Villó, "Insights into international branch campuses: Mapping trends through a systematic review," Journal of Business Research, vol. 101, pp. 507–515, Aug. 2019, doi: https://doi.org/10.1016/j.jbusres.2018.12.049.

[4] D. A. Stanfield, "International branch campuses: Motivation, strategy, and structure," Boston College University Libraries, Jan. 2014.

[5] P. L., Eddy, "Partnerships and collaborations in higher education," W&M ScholarWorks, 2010.

[6] M. Whatley, A. C. Landon, M. A. Tarrant, and D. Rubin, "Program design and the development of students' global perspectives in faculty-led short-term study abroad," Journal of Studies in International Education, vol. 25, no. 3, p. 102831532090615, Feb. 2020, doi: https://doi.org/10.1177/1028315320906156.

[7] C. Ottman and Sohum Sohoni, "Lessons Learned to Promote Teaching-Oriented Cross-Cultural International Mentoring and Collaboration," Papers on Engineering Education Repository (American Society for Engineering Education), Aug. 2024, doi: https://doi.org/10.18260/1-2--47729.

[8] L. L. Wu, R. M. Cassidy, J. M. McCarthy, J. C. LaRue, and G. N. Washington, "Implementation and impact of a first-year project-based learning course," 2016 ASEE Annual Conference & Exposition, June 2016.

[9] N. Choi and L. L. Wu, "Assessing Best Practices of a Multidisciplinary Experiential Learning Engineering Course," 2024 ASEE Annual Conference & Exposition, June 2024.