

Exploring the Significance of Theatre as a Pedagogical Tool in Teaching Personal Communication to Engineering Students

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Abstract— This innovative practice full paper explores the significance of theatre as a pedagogical tool in teaching personal communication courses to engineering students. Teaching non-technical subjects, such as humanities and communication courses, to engineering students has been a momentous challenge. This is due in part to the perception that these subjects are not directly related to the technical nature of the field of engineering studies. Furthermore, these courses are perceived to be irrelevant to the practical applications of technology and engineering in the real world. Engineering students prefer hands-on, practical, and experimental projects that directly correlate with their technical field of study. Therefore, instructional methods and pedagogies play a pivotal role in shaping engineering students' learning, especially of humanities and communication courses. Personal communication courses in the past have been primarily delivered through lectures on communication theories and a few classroom experiences delivered through activities. However, in an effort to enhance the learning efficacy, we chose to use theatrical formats and exercises as a pedagogical tool to teach personal communication capacities and skills. This unconventional approach allowed us to bring the dynamism of real-life communication scenarios into the classroom. The theatre exercises were adopted from the work of Augusto Boal and Konstantin Stanislavsky and were used in two ways: 1. Physical theatre exercises which involved body work and movement-based exercises. 2. Theatre-based communication activities, which involved group activities based around various roles and characters, in case-study scenarios. The theatre activities, specifically tailored for practicing personal communication skills, provided students with a platform to simulate real-life experiences within the safe confines of a classroom, thereby providing them with a unique opportunity to exercise their communication skills in a practical context. Our research included control and experimental groups, with the latter having the Theater-Oriented Pedagogy (TOP) integrated into their curriculum. The data analysis revealed a higher learning performance in personal communication skills among the experimental group. Additionally, students preferred communicative theatre exercises in comparison to physical theatre exercises. This paper, therefore, argues that the learning performance of personal communication

skills significantly improves when the theatrical format is employed as an instructional method for engineering students.

Keywords— *communication skills, theatrical exercises, instructional method, simulation*

I. INTRODUCTION

The use of exercises borrowed from theatre training is increasingly being adopted as a viable pedagogical form of training for undergraduate students to improve communication skills [1][2]. This pedagogical form not only allows students to actively engage in the classrooms but also improves their social consciousness and well-being [3][4]. However, less work has been done on understanding how these activities can be redesigned to make them more accessible to engineering students. Therefore, this paper seeks to assess both qualitatively and quantitatively the effect of introducing theatre exercises in the training of undergraduate engineers to aid not only in improving communication skills but also in developing emotional intelligence in relationship building. The theatre exercises were based on basic physical theatre exercises and theatre-based communication activities. So, this paper also tries to gauge which type of theatre activities are perceived to be more useful by engineering students.

II. BACKGROUND

Engineering education in the 21st century has evolved to be a multidisciplinary field. This is because educators today need to keep in mind the rapid technological changes that are happening in our world today to align the engineering curriculum to real-world requirements [5]. Even the employers and governments today are looking at technological innovations not only to solve niche problems, rather they are looking at them as a solution towards bigger world problems

like economic growth, environmental challenges, public health etc. [6]. Even accrediting agencies like ABET (Accreditation Board for Engineering and Technology) expect engineering students to gain proficiency in teamwork skills [7]. This is why researchers have repeatedly established the need for humanities and communication courses in engineering curricula to better understand the bigger world problems and the context within which they exist [8][9][10].

A. Problems with existing courses

However, even after establishing and integrating communication courses into the engineering curriculum, a major divide persists in the attitudes of engineering students in terms of utility and learning satisfaction gained from such courses [11]. This is because of multiple factors like lack of perceived need for such courses amongst students and curriculum overload [12][13]. Added to this is the fact that the majority of humanities and communication courses taught to engineering undergraduates use traditional pedagogy of teaching such courses which revolve more around reading, lectures and writing which is not very appealing to a large chunk of undergraduate engineering students. This is because engineering students are much more engaged and attentive with active learning strategies that involve hands-on, practical experiments [11][14]. Additionally, such learning strategies also tend to improve the learning efficacy of undergraduate students [15][16].

Hence, it is imperative that engineering students should be taught humanities and communication courses. However, to make such courses more accessible to the engineering community, it becomes essential that humanities and communication courses are taught to them after being redesigned and making use of pedagogies which makes such courses more practical, hands-on, and real-life based [16]. Therefore, this study uses theatre as a pedagogical tool to teach a communication course to engineering students which can potentially act as a bridge between the theoretical pedagogy of communication courses and active learning strategies, which are preferred by engineering students.

B. Theatre Oriented Pedagogy

The use of theatre in education is not a new concept as it was initially introduced in Britain in the 1960s with the goal of emphasizing education that is centred around the child [17][18]. Based upon the socio-cognitive model of learning, theatre offered especially potent learning opportunities by building upon the theory of learning by Bandura [17][19]. According to

Bandura, people learn by different avenues including seeing other people, getting feedback, reflecting on themselves, and interacting with their surroundings [20]. Therefore, the settings that are created by the theatre exercises focus upon creating simulations of real-world situations through which students are given an opportunity to see how other people behave which in turn allows them to reflect and respond. This prepares students for similar situations in the real world in the future [18]. Additionally, theatre has also been used to encourage creativity and develop critical thinking along with creating social awareness amongst undergraduate students and building empathy [20][21].

According to Boal, a revolutionary theatre practitioner, through theatre exercises, students abandon a habitual form of expression, hence enabling a recognition of the strengths and limitations of both their speech and body [22]. Theatre also prompts an immediate introspection bringing in an element of restraint and respect towards others. It also enables participants to note the impact their bodily expressions have on others, therefore helping students in building empathetic working relationships [18]. Similarly, Peter Brook, a well-known theatre director, in his book writes about how theatre is a "form of knowledge," wherein the human experience is examined from all angles. Theatre offers expressions that are holistic which all-encompasses the mind, body, language, relationships, history, and culture [23]. These skills, necessary for an actor, can also be taught through simulations to implement educational interventions [18]. Since these activities are being used currently in different educational settings, primarily limited to liberal arts colleges, in contrast, this study uses theatre as a pedagogical tool amongst engineering students in order to study its effect on student learning and their perception of such pedagogical tools.

III. METHODOLOGY

A. Research Questions:

1. How are student learning and performance affected when theatre is used as a pedagogical tool in teaching a personal communication course to engineering students?
2. Does restructuring theatrical exercises to be more communicative and less physical make them better suited for engineering students?

B. Participants

A total of 199 engineering students (104 from the second semester and 95 from the fourth semester; 137 male, 62 female) of a technological university constituted the participants.

C. Procedure

Data was collected in two stages:

1. Student performance data was collected from the second-semester and fourth-semester students who took the personal communication course. The personal communication course was taught to the fourth-semester students using traditional methodology and had a strong emphasis on the theoretical component (control group). Meanwhile, the same course taught to the second-semester students used theatre as a pedagogical tool (experiment group).
2. Additionally, an end-of-course survey was conducted of the second-semester students to gauge the student perception of the different types of theatrical exercises which were used as a pedagogical tool to teach the personal communication course. The survey collected both qualitative and quantitative data so as to better understand student perception of these exercises.

D. Context

The course was directed towards making students understand the value of relationships and effectively communicate in their personal and social worlds. The course was divided into two parts. The first part was delivered in 6 modules (2 hours each) in two weeks, focusing on theoretical and knowledge components. In these six modules, verbal communication skills were practiced using theatrical exercises. The content of the first six modules is given below:

Session 1: Introduction – An introductory overview of the course, its unique features, the structure and outputs of the projects, and the assessment mechanisms.

Session 2: Empathetic Project-building – Personal Communication is important because we always find ourselves in ‘world-building projects.’ This involves doing things together. As human beings, we are constantly building ‘projects.’ Here, the word ‘project’ is used in a broader and fundamental sense. It could include one’s career, one’s specific work assignment, one’s family, one’s social relationships, and one’s entire life itself. Furthermore, a project must have a clear problem to resolve, and the resolution or solution of such problems must come through empathy. Empathy is defined here

as active listening in order to solve a problem worthy of a world-building project.

Session 3: Building passion with Intentionality – Passionate persuasive speech based on intentionality i.e., through deep noticing (observation) and curiosity enables the students develop personal ownership of the problem to be addressed by the projects. Here, students must show how the problem resonates or connects with their-selves.

Session 4: Working with peers through relationality – There are always people in the team whom we didn’t choose. But one still needs to optimize teamwork and learn to successfully collaborate with all team members on the project. In order to achieve this goal, the basic principles of relationality i.e., treating others as “thou” rather than “it” (Martin Buber) is essential. Moreover, each team member must be assigned appropriate roles, functions, and responsibilities in the project to resolve the problem and build the solution together.

Session 5: Building Lasting Relationships through Effective Articulation – while building project solutions if there is effective articulation (i.e., conversations, dialogues) then it results in both innovative solutions (to the problem) and also long-lasting relationships.

Session 6: Presentation (Performance) – The final presentation was the public showcasing of the project output prepared by the students in front of an audience through their performance.

The second part of the course consisted of 5 tutorials (2 hours each) and a final presentation, conducted over six weeks. This part of the course is run on a tutorial model, where the class was broken into groups of six to seven students. During these six weeks, students worked on a real-world project, collaboratively with their peers, under personalized attention from their tutors and continued the practice of theatrical exercises. Every week during both lectures and tutorials, theatre was used as a pedagogical tool to teach the communication skills. Theatre was used in two ways: physical theatre exercises and theatre-based communication activities.

1. Physical Theatre exercises: These were exercises that focused on body movement, breathing, awareness of space and body work like Stanislavsky’s warmup routine (based upon breathing into your core), cleaning the bubble and viewing gallery [24]. These activities were taken directly from key sources like *The empty Space* and *An actor prepares*, which explore in depth, the actor’s movement on stage [23]. Here is a small description of one such exercise. “*Cleaning the bubble*”: *Students are instructed to imagine that they are inside a giant bubble, the dimensions of which are determined by how far their hands will stretch on either side, with their feet stuck to*

the floor. The bubble is very dirty, and they must clean it thoroughly with an imaginary soap, sponge and drying cloth in each hand. They cannot move their feet and must stretch around to clean the parts of the bubble behind them. Once they are done, they must prick it and step out. This teaches the students to reflect upon and gain control over their breathing which simultaneously gives them more control over their body movements. Such exercises were designed to give students exposure to a sense of performance and reducing their stage fright while simultaneously working on their non-verbal skills like body posture etc.

2. Theatre-based communication activities: these were group activities that students did in which they played various roles and characters, in imaginary scenarios/simulations with prompts based around character taking, group work and discussion activities. These activities were recontextualized for engineering students. Here is a description of an exercise. *“Three picture story”*: Students were asked to portray a real-world problem and solution in three pictures using their bodies and dialogues so that they learn to present and articulate their content in a concise yet innovative manner, representing a storyline. This was to teach the students teamwork, effective inter-personal communication and problem-solving skills.

E. Data Collection

The data was collected in the form of student grades, and post-course survey. All the students were required to take the survey at the end of the course. The survey consisted of questions that focused on the effectivity of theatre as a pedagogical tool for teaching personal communication skills to the students. The Table 1 consists of the sample questions that we used for our study. A total of 21 questions were used to assess the student perception on theatre-oriented pedagogy. More specifically, a 5-point Likert scale was used to assess student responses to the questions: 1 being Strongly Disagree and 5 being Strongly Agree. The survey was conducted once during the final week of the semester. All the survey responses were anonymized, which was conveyed to students to reduce social-desirability bias.

TABLE I. SURVEY QUESTIONS

Physical theatre exercises increased your learning and practicing of the following skills:
Empathy (Coming up with a problem)
Intentionality (Creating passion for the problem)
Relationality (I-it to I-thou, distribution of work)
Articulation (Creatively working together for the solution)
Presentation (Perform before an audience)

Similar questions were asked to compare the efficacy of two different types of theatre exercises. Additionally, reflection questions asking for the reasoning behind the ratings were also asked from the students to better understand their perspective on the exercises.

F. Data Analysis

The study used a multi-method design to analyze the data. The quantitative data was analyzed using descriptive statistics followed by a t-test. The overall course goals-exercise resonance score and student perception score of the theatre exercises was calculated by computing the overall mean for the two sets of 5 questions. Further t-test was used to compare the scores on both the categories for physical theatre activities and communication-based theatre activity. The qualitative student reflections were analyzed using a thematic analysis approach.

IV. RESULTS

A. Results for student performance in Personal Communication course

TABLE II: DESCRIPTIVES FOR ACTUAL STUDENTS' PERFORMANCE

	Group	N	Mean	SD	SE
Marks Scored	Sem2	104	84.274	5.431	0.533
	Sem4	95	81.425	7.513	0.771
	t	df	p	Mean Difference	
Marks Scored	3.041	169.847	0.003	2.849	

Note. Welch's t-test.

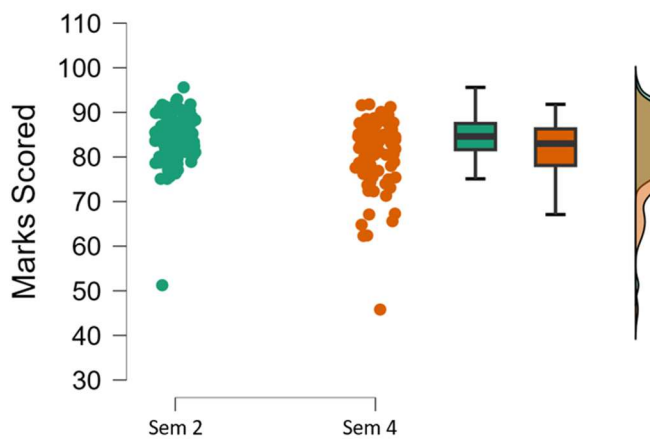


Fig. 1. Distribution of Students' performance.

As demonstrated by the Table 2 and Figure 1, an independent samples t-test was done to see the difference in actual performance scores for the experiment (Sem 2) and control trial (Sem 4). The results from the experiment trial ($M = 84.27$, $SD = 5.43$) and control trial ($M = 81.425$, $SD = 7.51$) indicate that there is a statistically significant difference in the actual performance scores between the two trials and students did better during experiment trial in comparison to the control trial $t = 3.041$, $p = .003$. The box-whisker plot also shows how the majority of students did well when taught using theatre as a pedagogical approach (Sem 2) when compared to the previous course (Sem 4).

B. Results for student perception in achieving course outcomes

TABLE III: DESCRIPTIVES FOR STUDENT PERCEPTION ON ALIGNMENT/HELPLESSNESS OF THEATRE ACTIVITIES WITH THE COURSE OUTCOMES

	N	Mean	SD	SE
Physical TA	104	3.533	0.697	0.068
Communicative TA	104	3.727	0.736	0.072

Measure 1	Measure 2	t	df	p
Physical TA	- Communicative TA	-2.493	103	0.007

Note. For all tests, the alternative hypothesis specifies that Physical TA is less than Communicative TA.

Note. Student's t-test.

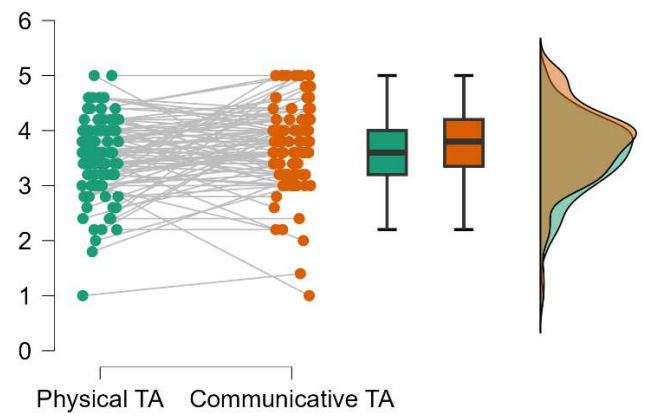


Fig. 2. Distribution of student perception on Alignment/Helpfulness of theatre activities with the course outcomes.

As depicted by the table 3 and figure 2, a paired samples t-test was done to see the difference in student perception on Alignment/Helpfulness of different types of theatre activities (TA) in achieving the course outcomes for the experiment (Communicative TA) and control trial (Physical TA). The results from the experiment trial ($M = 3.72$, $SD = 0.736$) and control trial ($M = 3.53$, $SD = 0.69$) indicate that there is a statistically significant difference in the student perception of helpfulness of theatrical activities in achieving course outcomes between the two trials and students did better during experiment trial (Communicative TA) in comparison to the control trial (Physical TA) $t = -2.49$, $p = .007$.

C. Results for student perceptions on Physical vs Communicative TA

TABLE IV: DESCRIPTIVES FOR STUDENT PERCEPTION OF PHYSICAL VS COMMUNICATIVE TA

Descriptives	N	Mean	SD	SE
Physical TA 2	104	3.524	0.734	0.072
Communicative TA 2	104	3.892	0.697	0.068

Measure 1	Measure 2	t	df	p
Physical TA 2	- Communicative TA 2	-4.60	103	< .001

Note. For all tests, the alternative hypothesis specifies that Physical TA 2 is less than Communicative TA 2.

Note. Student's t-test.

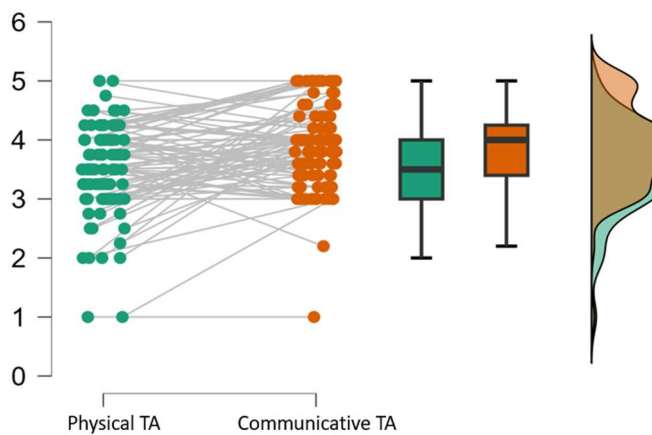


Fig. 3. Distribution of Student perception on physical vs communicative TA.

As shown in the table 4 and figure 3, a paired samples t-test was done to see the difference in student perception on different types of theatre activities (TA) for the experiment (Communicative TA) and control trial (Physical TA). The results from the experiment trial ($M = 3.89$, $SD = 0.69$) and control trial ($M = 3.52$, $SD = 0.73$) indicate that there is a statistically significant difference in the actual performance scores between the two trials and students did better during experiment trial in comparison to the control trial $t = -4.60$, $p < .001$.

D. Qualitative analysis

The reflection questions were qualitatively analyzed using thematic analysis. The themes that we generated from the survey were:

Theme 1: Students expressed satisfaction and enjoyment with the theatre-oriented pedagogy. Under this theme, majority of the students expressed that they enjoyed the new method of learning personal communication skills through theatrical activities rather than in a traditional classroom setting. For example, S2 said *“I Liked theatre as an instructional method because it made me come out of my comfort zone without making me realise, I am doing that.”* On similar lines another student expressed the importance of these exercises as S6 said, *“I particularly enjoyed the theatre-based communication activities as according to me, they made me think on a deeper and more critical level. I was able to go beyond words and understand the situation from a personal level.”* Additionally, we also found a few students who went beyond the enjoyment and learning aspects of these activities and were able to realize a deeper significance within themselves. For example, S11 said, *“Yes, it is helpful in teaching personal communication skills. The way you talk, the*

way you express, the way you emphasize on the words, the way you enact, your body language, the way you blend in with the character, it all leads to the betterment of communication of oneself.” This quote reflects that the student was able to enjoy the activities and fulfill the role, but at the same time was able to understand what competencies these activities translated into, when practiced over time.

Theme 2: The students found the Communicative theatre activities more enjoyable than Physical theatre exercises. This theme highlights that communicative theatrical activities that involve speech, dialogue and role-play were more appreciated than physical theatrical exercises by the engineering students. For example, S12 mentioned, *“I feel that the physical theatre exercises didn't do much in terms of communication skills. I would much rather engage in activities that require an aspect of speaking and talking and aren't that abstract.”* This quote shows that the student was not able to see the impact of physical theatre activities in the longer run and wanted something less abstract and more engaging. On the same lines another student S 19 said, *“Surely, there was some difference that these exercises made but for me personally, they weren't as helpful as I thought of them to be. They helped in personal communication between my peers, but I wouldn't say that it led to a huge change in my behaviour.”* From this student quote, we again see that the student is confused about the outcomes of the physical theatrical exercise and therefore is not able to see the benefit of the same.

Theme 3: Students felt theatre-oriented pedagogy could yield even better results if they were more deeply aligned with engineering themes. For example, S22 said, *“I think theatre is a good way to learn but there should be a different mechanism for learning and not just watching it and forgetting about it next time. I think theatre is for getting practical experience and if we don't get that then what's the benefit of it.”* This student echoed a minority voice, nevertheless a voice that questioned theatre as pedagogy for engineering students. The student felt that this mechanism had to be different, in that it had to give practical experience which for them was a deeper engagement with the world of engineering. Similarly, another student, S 36, said, *“I'm somewhere in the middle because I didn't completely enjoy these exercises due to them taking me out of my comfort zone but in terms of teaching personals communication skills, I think they did help in some way. I don't think we did them enough or in depth enough for them to have very significant impact.”* This reflects how the student is struggling with this pedagogy even when they enjoyed it, as it was not as deeply aligned with their engineering worldview. In both cases, we believe that students felt that they needed

exercises that not only make them communicate but can also be linked to their fields.

V. DISCUSSION

The study focused on understanding the impact of theatre-oriented pedagogy on the performance of undergraduate engineering students in a personal communication course. The study also tried to compare student perceptions of physical theatre exercises (taken directly from the professional actor's handbook) with communicative theatre activities which had been designed to meet course goals.

A. Impact on actual performance

Quantitative data analysis through an independent samples t-test shows that the performances of the students who took the personal communication course with TOP (theatre-oriented pedagogy) did significantly better than the group of students who did the same course without the theatrical component. This suggests that the use of theatre as a pedagogical tool positively impacted student performances and learning. This finding is in line with our literature, which suggested that making humanities and engineering courses more hands-on and providing simulation-based learning to engineering students leads to better learning and performance [15].

B. Physical theatre activities vs Communicative theatre

Quantitative analysis using a paired samples t-test demonstrates that according to students, communicative theatre activities were much more effective in achieving course goals/outcomes in comparison to the physical theatre exercises. This shows that activities that allowed students to engage with each other practically, were perceived to be better in terms of achieving course outcomes. Similar findings were reflected in the quantitative analysis of student perception of these exercises. A paired samples t-test of students' theatre activity perception ratings revealed that they liked/enjoyed communicative theatre activities significantly more than the physical theatre exercises.

Therefore, it can be deduced from the above findings that restructuring theatrical exercises to make them more communicative and less physical makes them significantly better for engineering students. An interesting thing to note here is that the difference between the two theatre activities (Physical vs Communicative) was much more significant when looking at activity perception ratings in comparison to ratings for achieving course goals and outcomes. This shows how both

activities were effective in delivering course goals, even if the students enjoyed the communicative theatre exercises more.

C. Qualitative Analysis

To better understand the reasons behind the findings, we evaluated the qualitative data using thematic analysis. Results demonstrated that most students were excited by the theatre-oriented pedagogy used and enjoyed the teaching methods. This finding again is in line with literature which suggests that active learning pedagogy produces higher learning efficacy amongst engineering students [13].

As for the physical theatre exercises vs communicative theatre activities, students enjoyed the latter much more. This may be due in part because the communicative theatre activities were more aligned with the students' projects and did not ask them to do abstract exercises that made them feel too vulnerable at times. An additional explanation might recognize the need for introducing physical theatre-based exercises by instructors who are professionally trained and practiced in this particular art form, rather than by simply applying exercises acquired from a professional actor's handbook. Additionally, the selection of other physical theatre-based exercises that might be more obviously relevant to an engineer's training might address some of the sentiment expressed by students who wished for more activities that involved an engineering approach. Some students also mentioned that the communicative activities were too short and wanted more time to do them. These findings demonstrate the overall success of the theatre-oriented pedagogy in building the interest of students in the course.

D. Implications

This study has numerous implications for instructors who are looking to switch to active learning pedagogies and make their classrooms more interactive. We strongly argue for using theatre as a pedagogical tool. First, the use of theatre-oriented pedagogy can be helpful to engineering students in a variety of ways apart from merely improving their communication skills as these exercises also teach empathy, social awareness, and human well-being. Hence, the objective of teaching humanities and communication courses to engineers can be effectively accomplished through the use of theatre-oriented pedagogy. Second, although theatre activities provide a major boost to student learning in the classrooms, it is important to further contextualize these activities for engineering students. Furthermore, as highlighted by one of the major themes that came out of this research, a more in-depth exploration of theatre activities considering engineering projects might help

engineering students understand and enjoy theatre-oriented pedagogy even more.

VI. CONCLUSION

The use of exercises and activities borrowed from theatre training is increasingly being adopted as a viable pedagogical form of training for engineers. For this study, the results indicate that theatre-oriented pedagogy has a positive impact on student performance in the personal communication course. Additionally, the results of theatre training showed student perception of communicative theatre activities to be preferential to physical theatre activities in achieving course outcomes. However, theatre-oriented pedagogies are still novel with regard to engineering education and require adequate training on the part of instructors in order to effectively convey the relevance of such an approach. Theatre provides a powerful, practical simulation of the human condition. Therefore, if contemporary engineering involves solving various human and planetary problems, then theatre-based pedagogies can play a significant role in enabling engineers to internalize and reflect on the complexities of the problems faced by humans at this time.

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