Boal in Space: Using Forum Theatre to Improve NASA Engineering

By Amy Guerin

Abstract

This article explores NASA-funded research among faculty in the Theatre Program and Departments of Industrial and Systems Engineering, and Psychology at the University of Alabama in Huntsville using Theatre of the Oppressed (TO), specifically Forum Theatre. The project examined the use of TO theories and techniques to improve NASA's organizational culture and systems engineering processes. Throughout 2020, the Theatre side of the research team, which included a faculty lead, undergraduate research assistant, and two professional actors, worked together to develop a Forum Theatre-based set of scenarios to present to NASA engineers. The diverging expectations of the other faculty researchers and the NASA leadership involved in funding the project, and the COVID-19 pandemic caused major changes to the original scenarios and their presentation. This article discusses the original proposal, how and why changes were made to this plan, and asks the question, 'Is this still Boal?'

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INTRODUCTION

Summer 2020: the members of Team Space Eagle take a break from a development meeting to double-check budget numbers:

"Are we sure it's $150 million? That seems like a lot."

"That's what Bryan said. $150 million for just that amount of food and equipment."

"For an eagle?"

"An eagle on *a spaceship! **To Pluto**!*"

"Right, right. Okay, $150 million dollars it is--somebody update the script in the Google Drive."

"On it."

This dialogue, taken from one of the five Forum Theatre-based scenarios used in this research project, is an example of the broad humor used to pique spect-actor interest in what hidden truths keep NASA engineers from doing their best work.

Funded in 2019 by the NASA Systems Engineering Consortium, this transdisciplinary collaboration between Theatre Program faculty and colleagues in the Departments of Industrial and Systems Engineering, and Psychology at the University of Alabama in Huntsville (UAH) pursued a mandate to examine social systems and, thereby, improve production processes within NASA's engineering division by exposing hidden truths affecting the division's culture and processes.

UAH is uniquely positioned to take on this work because of our strong focus in aerospace engineering and military contracting, due to the presence of both the Marshall Space Flight Center and the US Army Installation Redstone Arsenal minutes away from campus. A STEM campus since its founding in 1969, UAH did not develop a major within the Theatre Program until 2015. I joined the Theatre Program faculty the next year to help build the program, after nine years at Texas A&M, where I collaborated with members of the Computer Science and Engineering faculty to cast flying robots as the fairy characters in a production of *A Midsummer Night's Dream* in 2009. This production was covered by *Wired* magazine and the NPR program *Science Friday*, among others. It showed me that these kinds of interdisciplinary collaborations between theatre and seemingly unrelated science fields like robotics were possible and hold great promise for generating knowledge.

Soon after arriving at UAH, I was introduced to Dr. Bryan Mesmer, and then-doctoral student Giulia Palma, both with the Department of Industrial and Systems Engineering (SE). Dr. Mesmer and Palma were engaged in a project to use non-engineering surrogates, which are broadly defined as systems with repeatable processes that result in a final product, like theatre, restaurants, or fashion design and distribution. These non-engineering surrogates were examined as models to refine or reform SE processes. In meeting with Dr. Mesmer and Palma, it was clear that theatre was a solid fit for what they were looking for in a non-engineering surrogate. Theatre uses a fairly uniform production process both in performance and design across the theatrical landscape that is repeatable, short (relatively speaking, compared to the years or decades of some SE projects), strictly budgeted, team-based, and results in a final product: a theatre production. Our work in non-engineering surrogates is ongoing

and we are currently in the process of applying for a grant through the National Science Foundation to continue this research.

Concurrent with the exploration into surrogates came the opportunity to collaborate with Dr. Kristin Weger, also with UAH, in the Department of Psychology. Dr. Weger's research in organizational development allows her to translate discussions of abstract concepts surrounding culture and processes into hard data, a key asset in addressing hidden truths affecting engineering processes at NASA.

In 2019, the first iteration of the project did not go as well as was hoped for by the research team. At NASA's request, our team included a Chicago-based firm that used Spolin-based improvisation techniques to present a traditional improv show at a NASA symposium in August 2019 in Houston, Texas. Leading up to this symposium, there was a two-day workshop at UAH with the improv facilitators, the research team, and UAH theatre students to hammer out what improv activities would be presented, how conference attendees (NASA budget and scheduling analysts) would be recruited to participate as performers, and what training those recruits would need in the improv activities they would be performing. Data from audience and participant surveys after the symposium performance showed that "The participants were a receptive community; 85% of responding participants indicated a willingness to participate again. However, there was low engagement from the symposium attendees overall. Out of the approximately 250 attendees of C&S, only around 80 (32%) attended the improvisational comedy workshop" (Banks et al.)

As the project moved into the later part of 2019, the research team recognized the need for a different improvisation technique in order to more strongly go after the hidden truths we were charged with uncovering and resolving. Hidden truths are the kinds of organizational understandings that are generally perceived to be negative, well-known by all, and not spoken of by employees, especially those lower down in the organizational hierarchy for fear of reprisal. For example, a hidden truth specific to NASA budget analysts might be that all budgets get inflated 75% beyond the original assessment in order to accommodate for later, unplanned expenses, and that that overage is simply folded somewhere into the line items in the budget.

We needed a technique that was centered on the audience experience, not the performer experience. Additionally, having this more robust set of theories and techniques would also make it easier to advocate for further funding because the work was grounded in peer-reviewed theory. In discussions with Dr. Mesmer and Dr. Weger, it was clear to me that TO was what was needed. TO is theoretically sound, uses developed techniques, and with the emphasis on change through direct action via the spect-actor, fills the needs of the project. Ideally, the information gained through TO sessions with NASA employees would provide concrete examples of how NASA's organizational culture was holding back its employees from doing their best work. These concrete examples would then be shared through NASA upper echelons, leading to positive change, and then to more optimal project outcomes from final product, budget, and scheduling perspectives. Working on the project in 2020 began for me with a close reading of *The Theatre of the Oppressed* and a plan for how to apply TO in person to the NASA engineering

environment, most prominently at a conference in August at Cape Canaveral. Yet, as we all know, fate had something else in mind for 2020.

The goal of this article is to explore the project through the lens of theatre, to understand why and how TO was chosen as the theatrical foundation, the initial aims of the project using TO, how TO was applied, how the aims changed over time as the work met audiences, what happened in performance, and how Forum Theatre was adjusted to accommodate the restrictions of a global pandemic. Ultimately, the pedagogy of TO proved to be incompatible with the present needs of the research project because the goal was to uncover and understand hidden truths, not to solve them in a scenario-based format.

UNDERSTANDING SYSTEMS ENGINEERING: TERMS AND IDEAS

To understand the aims of this research project, we must first understand some of the basic terms and ideas of the field of Systems Engineering. The field of Systems Engineering (SE) is defined in the textbook *Systems Engineering Design, Analysis, and Development: Concepts, Principles, and Practices* by Charles S. Wasson as: "The multi-disciplined application of analytical, mathematical, and scientific principles for formulating, selecting, developing, and maturing an optimal solution from a set of viable candidates that has acceptable risk, satisfies user operational need(s), and minimizes development and life cycle costs while balancing stakeholder interests" (Wasson 2).

A Systems Engineer works across engineering areas—aerospace, computer, electrical, mechanical, nuclear, etc.—to ensure that a final product is completed on time and budget. A final product can be small and

simple, like a soda can, or large and complex, like a Mars Rover. No matter the size or complexity of the product, the SE Process can be simplified into the following steps:

1. Identify a system's stakeholders – users and end-users.
2. Understand and analyze stakeholder operational needs – user stories, use cases, and scenarios.
3. Transform those needs into performance specification requirements.
4. Incrementally select and document a multi-level System Design Solution using an Analysis of Alternatives (AoA) based sets of viable candidates.
5. Procure, develop, or modify the components.
6. Integrate and test components for compliance verification to specification requirements.
7. Incrementally conduct technical reviews to ensure Verification and Validation (V&V) to specification and task requirements.
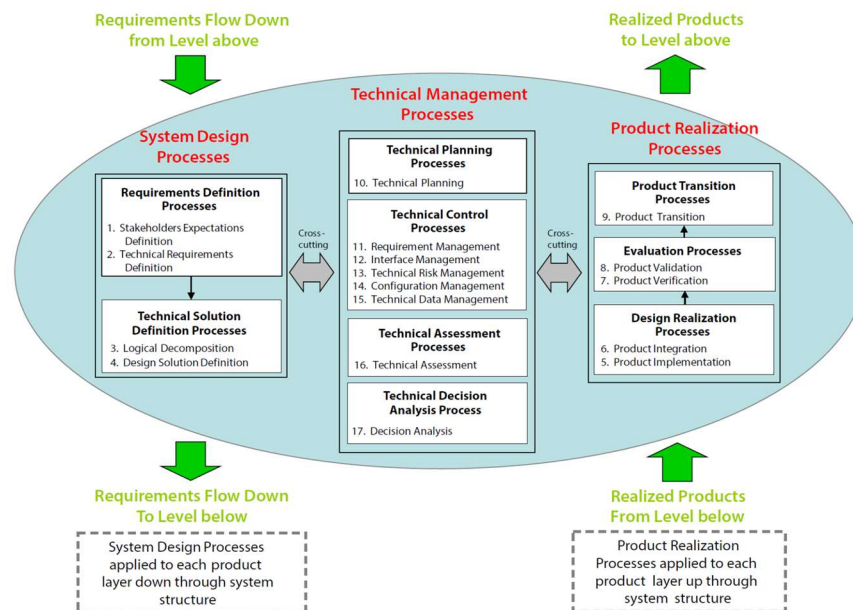8. Verify and Validate (V&V) the system throughout its development (Wasson)

FIGURE 2.1-1 The Systems Engineering Engine (NPR 7123.1)

(Hirshorn 16)

This SE Process leads to Systems Thinking. Systems Thinking is utilized for problem-solving when things go wrong and in the evaluation process after a project is at the end of its life cycle. Systems Engineers follow the steps listed below when working on a particular system/product/project:

1. Visualize or conceptualize any type of system – natural, engineered, or enterprise – and all of its constituent levels and components, their interrelationships, and operational interactions with its operating environment.
2. Perform a situational assessment of a system condition and level of urgency to initiate the appropriate, corrective actions in a timely manner.

3. Formulate, develop, and synthesize a set of solutions that respond to user operational needs and constraints.
4. Perform an AoA to evaluate and select the optimal solution that has acceptable risk to satisfy the user's operational needs and constraints for the least total life cycle cost.
5. Optimize the selected solution to provide the best value – cost-performance – benefit ratio – to the user based on their operational needs, priorities, and acceptable risk.
6. Observe system performance or the lack thereof, assimilate the observable facts, model, and analyze the contributory causes and effects. (Wasson 14).

While many of these terms are specific to SE, the ideas behind both the engineering process and the thought process are shared across disciplines. Theatre-makers will recognize aspects of the design process, the directing process, and the critical thinking that goes into evaluating a show in the post-mortem process within these SE-specific lists.

THE TRUTH IS OUT THERE: THE PROJECT, ITS JUSTIFICATION, AND ITS AIMS

The project, its justification, and its aims were outlined in a "Phase II Task Description" document written by the lead PI, Dr. Mesmer, and sent to NASA for administrative approval in November 2019:

> Project Management and Systems Engineering (PM&SE) are key to guiding the design and production of large-scale complex engineered systems. However, the processes of PM&SE are themselves large-scale complex engineered systems. These

"systems" are formed by many distinct subsystems (people) coming together in webs of couplings (interactions) that produce emergent behaviors (work). These emergent behaviors are sometimes unexpected and can drive unwanted system outputs such as cost overruns and delays. While a physical system can have its subsystems tested and analyzed to determine issues that may lead to unwanted behavior, a system of people is much more challenging. PM&SE is unlike a physical subsystem which responds with truth to whatever analysis or test is being conducted (understanding the assumptions of the analysis/tests). Determining the challenges in PM&SE is itself a challenge.

To dig deeper into these social systems of PM&SE, a radical approach such as improvisation may be needed, where practitioners' inhibitions are removed and challenges faced in PM&SE can be identified. Phase II work extends the findings of Phase I [literature review and 2019 Houston workshop] to produce a formalized template of "Forum Theatre"-inspired workshops to elicit unspoken truths, based on rigorous theory from multiple disciplines. The workshop template is then used to run a workshop at MSFC [Marshall Space Flight Center] on SE and MBSE [Model-Based Systems Engineering], as well as a workshop at the 2020 NASA Cost and Schedule Symposium.

The focus of these workshops is to identify unspoken truths in communities that are adopting techniques at their early stages. Application of these workshops will enable agency leads to identify potential concerns in their groups that may not otherwise be spoken. This is especially important when communities are asked to

adopt new technologies, such as MBSE, and may not speak the truth on their experiences due to pressure from leadership to adopt. (Mesmer)

From a theatre perspective, what Phase II asked for was a Forum Theatre-based set of interventions that would produce candid conversation amongst the audience of NASA engineers about cultural issues within their workplace that are implicit, unspoken, and negatively experienced. TO and Forum Theatre work by "turning the practice of theatre into an effective tool for the comprehension of social and personal problems and the search for their solutions" (Boal, *The Rainbow of Desire* 15). It offers a safe space that "within its fictitious limits, the experience is a concrete one" (Boal, *Theatre of the Oppressed* 141). These unspoken issues are not only harmful to the humans working in this environment but are also harmful to the engineering projects underway--the stress of a suboptimal working environment can lead to projects with cost overruns and delays. Bringing these "hidden truths" to light via Forum Theatre means a more transparent organizational culture and more streamlined and innovative engineering practices and projects for NASA. Forum Theatre becomes the "mechanism of transformation" for NASA's social systems (Boal, *The Rainbow of Desire* 27).

Our project was fortunate to have administrative support from personnel at NASA's Office of the Chief Engineer. The next step was turning the administrative support into funded support. We received that approval in December 2019 from the NASA Systems Engineering Research Consortium. Funding was provided starting in spring 2020 to the theatre area of the research team that covered a summer research salary for me, an undergraduate research assistantship for summer and fall 2020 and

spring 2021, and for two professional actors to be trained in TO and perform the interventions in summer and fall 2020. Work with this theatre staff was scheduled to begin in June 2020.

PREPARATIONS BEGIN: SUMMER 2020

Utilizing TO and Forum Theatre to provide proactive insight into hidden truths at NASA meant that the theatre area would need to be well-versed in this work in order to connect the strength of Boal's ideas with the reality faced by NASA engineers. Preparations began in April 2020 for what would be a summer of work with the two professional actors hired for the project, Kelly Parks and Boz Wells, and the undergraduate theatre major research assistant, Rebecca L. Westbrook. During the summer, the four of us – we named ourselves Team Space Eagle – would be learning about TO, writing the scenarios used in the performance presentations, running through mock TO interventions from spec-actors; and, finally, when it was clear that we would not be meeting in person at all for the rest of 2020, revising our plans to make TO work in an online meeting format. Having detailed lesson plans and a calendar in place at the start of the training enabled us to pivot as the pandemic and the needs of the research project changed our work.

Rebecca and I started at square one by reading (or re-reading, in my case, although it had been about 15 years) *The Theatre of the Oppressed* and taking detailed notes. My notes were focused on the aims of TO and how it was taught/learned. In my reading, which grew to include *Games for Actors and Non-Actors, The Rainbow of Desire,* and *Pedagogy of the Oppressed,* I saw how explicitly Boal, as influenced by Paolo Freire, called for direct action by the spect-actors. Freire says, "But the struggle to be

more fully human has already begun in the authentic struggle to transform the situation" (Freire, *Pedagogy of the Oppressed* 32) and is brought even further by Boal when he says, "The poetics of the oppressed is essentially the poetics of liberation: the spectator no longer delegates his power to the characters either to think or to act in his place. The spectator frees himself; he thinks and acts for himself. Theatre is action! Perhaps the theatre is not revolutionary in itself; but, have no doubts, it is a rehearsal of revolution!" (Boal, *Theatre of the Oppressed* 155)*.* Could we bring a revolution to NASA? I hoped so.

Rebecca focused on researching videos of TO in workshops and performances so that we could show Boz and Kelly what we were aiming for in our presentations. Our schedule began on June 30 with three 1-hour sessions on the major ideas of TO, including its context, its forms, and its primary movers, the Joker and the Spect-actor. The Joker is essentially a narrator, connecting the action happening "onstage" and the actors, with the audience, whom Boal called "spect-actors," because he expected them to both watch and participate in the theatre piece happening in front of them.

Our next step as Team Space Eagle was to begin collaboratively writing the scenarios that Kelly and Boz would perform for our audiences of NASA systems engineers, with Rebecca as our Joker. We had a list of five topics, generated from attendee feedback from the 2019 improvisation performance at the Cost and Scheduling Symposium in Houston, which gave us an idea of what our scenarios needed to be about. The topics covered the problems that arise when 1) new unfunded projects are added to a program unexpectedly; 2) leadership higher up in the organization only wants to hear good news; 3) unrealistic expectations

placed on budget planners when these new projects are added; 4) conflicts occur between new, younger employees and experienced, older employees; and, 5) managing the bureaucracy that comes with a large organization. Seven 90-minute sessions were scheduled for this task that would take us into mid-July 2020. Throughout these meetings, we brainstormed, wrote, re-wrote, discussed plot, characters, and scenario order until we came to one overarching plotline that connected all the scenarios. We also worked within the restriction of only having 60 minutes for all five scenarios plus spect-actor interventions, thus each scenario could be no longer than 5 minutes.

To pull in our engineer audience, we decided to develop a comedic plotline that was so outside the bounds of reality that they would put their focus on the story and the problems presented, rather than writing scenarios that were accurate to their current experiences and have them be derailed by engineering, process, or budget details that were or were not correct. The set of five scenarios that we wrote told the story of Operation Plutocracy, a manned mission to Pluto to accurately measure its size to ideally have it "repatriated" as a planet. Operation Plutocracy included Project Star Trek, intending to invent a warp drive engine that would take the astronauts (and eaglenauts, more on this momentarily) from the Earth to Pluto in 9.5 seconds. Gumming up the works were the surprise need for transporter pads to get the astronauts and their barbecue equipment (for that all-important photoshoot of the astronauts grilling out on July 4 on Pluto) to Pluto's surface, and the problem of how to plan for the bald eagles – Liberty and Justice – as NASA's first eaglenauts.

This calendar timeline, which ended in mid-July, while sufficient to write five scenarios, did not give us time to stage and rehearse them, and to include the Joker interventions. Just as Boz and Kelly needed to practice their lines and build their characters, we knew that we also needed to include time for Rebecca to get comfortable coming in after each scenario, asking questions of the spect-actors, engaging with them, and communicating their suggestions to Boz and Kelly. Team Space Eagle took a two-week break for previously planned vacations and line memorization and reconvened the last week of July for three weeks of rehearsals. Totaling 13 and a half hours of rehearsal time, we approached this section like a more traditional theatre rehearsal period. We staged – via our Zoom boxes – the scenarios, refined the characterizations, and then practiced having Rebecca serve as Joker while I stood in as every NASA engineer in our audience, making suggestions via audio and chat for ways that the problems in each scenario could be solved; the actors practiced improvising my suggestions for changes.

The final part of that three-week rehearsal period was the most important: practicing online interventions from the audience. Somewhere in early July 2020, it became obvious that none of the in-person conferences or center meetings were going to happen; up until then we were cautiously hopeful for late fall 2020 in-person gatherings. All of our encounters with our engineering audiences would be virtual, and most likely with the attendees' cameras off. We had to anticipate the worst-case scenario that we would not be able to see our spect-actors and talk with them about what they saw and how they would fix it, or even inviting them to join the actors in amending a scene to include their solution. We might be able to hear their voices, but also had to be prepared for only working with our spect-actors via the chat function available to us. With

this worst-case scenario in mind, and mindful of maintaining fidelity to TO and Forum Theatre, our rehearsal work to this effect took into account how to prepare Team Space Eagle for what a presentation with online audiences that they couldn't see or hear would look and feel like.

FALL IMPLEMENTATION: AUGUST-NOVEMBER 2020

On August 27, 2020, Team Space Eagle held a dress rehearsal of sorts on Zoom with six students in one of Dr. Mesmer's engineering classes. We had 90 minutes and decided to present the first three scenarios, to have the most coherent story that covered a wide range of issues that could be resolved. Each scenario went as rehearsed. Kelly and Boz turned on their cameras and the scenes began. With just two actors, we didn't have to worry about box order or volume issues. Their virtual office backgrounds and green screens held up, and each scenario had a brief introduction, voiced by Rebecca, that stated who the characters were and where they were located. Kelly and Boz would change their names to each new character they played. We received good feedback from the engineering students on details within the scripts that could be changed to make it more realistic, like adding language about Technical Readiness Level, a scale from 1-9 used at NASA to indicate the feasibility of an idea or product, with 1 at the bottom of the readiness scale as a purely theoretical idea, and 9 being an idea or product that had been used successfully and could be used again.

The most interesting piece of information we received as a TO performance team was the long silences that occurred after each of the scenarios. It was challenging for Rebecca as our Joker to get the spect-actors discussing solutions to the problems presented. In encountering the

problems of long silences and unexpected feedback, subsequent rehearsals with Team Space Eagle now included the longest silence we could endure without Rebecca interjecting as Joker – approximately 15 seconds – and offering feedback from a more risk-averse viewpoint.

Finally, during this August dress rehearsal, Team Space Eagle was given the charge to ask more discussion-based questions after each scenario, to get to the hidden truths presented therein, versus jumping immediately to how to solve the evident problems. At a team meeting after this presentation, we implemented the script changes and came up with discussion questions to ask before moving into problem-solving mode.

A second dress rehearsal with the same set of engineering students was scheduled for September 24, 2020, in advance of our October 2, 2020 presentation to our primary funding contact in NASA's Office of the Chief Engineer, based in Washington DC. During this run, we didn't make it to the second and third scenarios we had planned. After the first scenario was done and Rebecca as the Joker had asked some discussion questions and then moved to elicit solutions, she was politely stopped by Dr. Mesmer. In his subsequent feedback, it was clear that the focus had to be placed fully on the discussion of the hidden truths that were uncovered – moving us away completely from any problem-solving suggestions from the spect-actors that TO would have us do. Rather than developing our own discussion questions that centered on character actions and behaviors, we were given a set of specifically worded questions to ask in the discussion portion. For example, one of the questions was "How did this scenario apply or not apply to your experiences of organizational culture within your center?" (NASA locations--Cape Canaveral, Houston,

Pasadena, etc--are called centers.) This was an unexpected development, as it seemed that the explanation of what TO is and how it worked was understood and accepted by the research team members. The resulting fallout took us away completely from anything that looked like TO. After this we were simply a traditional performance team, without the ability to utilize the TO skills we had practiced so deeply and carefully in the months leading up to these presentations. It was personally disappointing to me to have this happen, because I was intrigued by the question of what TO looks like in a virtual environment, but that is a question I was unable to answer.

The October presentation with the Office of the Chief Engineer, and another presentation on November 13, 2020, for members of the Systems Engineering Technical Discipline Team, based at the John Glenn Research Center in Cleveland, OH, had very similar outcomes for our team. We received a lot of feedback on how to make our scenarios more realistic, and on how to restructure the order of the scenarios. The research team was able to engage in conversation with members of the SE TDT that did uncover hidden truths after the scenario performances, but TO was not a part of either of these presentations.

Based on these four presentations – two dress rehearsals and two performances – the most basic of questions must be asked: is it still Boal? Rebecca said this, in an evaluative essay, once the project concluded:

> At the start of this project, for me at least, it felt like this project was about both the use of Theatre Methodology to influence engineering culture, but also about how Boalian Techniques could be useful for application in this setting. Throughout the scriptwriting process, the focus on Boalian Methodology was very

present, and influenced the ways we approached the subject matter and talked about resolving and presenting issues within the workshops we planned.

However, what I think was absent throughout this process that would have brought more of an emphasis to Boalian techniques in the end result of the project would have been to have the researchers on our team from the engineering department be present for a majority of the brainstorming and writing sessions. A big focus of Theatre of the Oppressed, as I interpreted it from my preliminary research, was the importance of highlighting the voices of the people this theatre work is meant to help, and a big way to include that would have been to have a more vocal presence from the engineering field throughout the writing process.

As more and more changes were made, the project was shifted more and more away from Boalian techniques and became more and more of a performance for the audience to comment on, and less of an interactive experience that encouraged the audiences to become Spect-actors. Not an incorrect result, but one that was very distant from what we were originally intending on when planning for these workshops.

In *Rainbow of Desire,* we see another possible answer: "This was not the normal way to use these techniques, but these techniques were invented to be useful to people...not with the goal of adapting the people to the techniques" (Boal, *The Rainbow of Desire* 188). While I understand the point Boal is making – that TO and its practices can change to adapt to the moment – ultimately, I conclude that what we ended up with was not Boal. We had five scripted scenes, discussion about the scenes, and the

issues raised within them, but, we were not working with the aim of "turning the practice of theatre into an effective tool for the comprehension of social and personal problems and the search for their solutions" (Boal, *The Rainbow of Desire* 15). Nor did we ask "the participants to intervene decisively in the dramatic action and change it," and this was not "theatre that attempts to influence reality" (Boal, *Theatre of the Oppressed* 168). Our efforts as Team Space Eagle began as TO/Forum Theatre, but that is not how our efforts ended.

FUTURE CONSIDERATIONS

In April 2021, NASA's Office of the Chief Engineer, our primary contact for funding and for connecting with SE teams within NASA, let the research team know that there would not be any upcoming presentations scheduled. It was a disappointing, but not unsurprising update. TO is suboptimal in achieving its aims via online meeting spaces because there is very limited opportunity for the kinds of spect-actor involvement that differentiates TO from traditional improvisation. Additionally, as noted above, we were no longer doing any TO work within our presentations. Later in 2021, or in 2022, it may be possible to resume in-person presentations at NASA symposia and conferences because the research team has yet to truly use TO to improve SE processes and organizational culture at NASA. In returning to in-person gatherings, the possibility is open for restoring TO to this project. By rewriting the scenarios in collaboration with the rest of the research team, or in educating the research team more via videos of TO methodologies in practice, there is potential that TO can be the vehicle to drive the change that the research project is aiming for. Our work is not yet done, and only time (and further NASA funding) will tell if we can complete it.

CONCLUSION

In conclusion, the idea of using TO to help improve Systems Engineering processes and organizational culture at NASA is an intriguing one. It is not usually the case that Boal and NASA are ever used in the same sentence. The collision of these two worlds is mysterious to both sides, and, like aliens from different worlds, we examine each other and our offerings and make our best attempts to communicate effectively. In our case, we did what we could to use TO and Forum Theatre in both the unfamiliar setting of NASA engineering and in the unyielding strictures and confusion of a global pandemic. That Team Space Eagle was unsuccessful in our efforts does not speak badly of us or our SE and Psychology colleagues. As I noted in the introduction, my collaborations with Dr. Mesmer and Dr. Weger are ongoing. Had we been able to be in person, our utilization of TO would have likely been more impactful, but circumstances beyond our control made that particular piece of this project impossible. After trying and failing to make TO work online, it is my opinion that Forum Theatre is not adaptable to online Zoom-based presentations. Forum Theatre needs in-person interactivity and collaboration, and that is at odds with the restrictions inherent in a virtual format. The work that I have done to learn, synthesize, and teach TO leads me to believe that it is one of the most effective and proactive tools for examining social systems and uncovering hidden truths. As mentioned above in the Future Considerations section, I am hopeful to return to this research project, because the questions we are asking remain unanswered.

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