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An Application of Multidisciplinary, Interdisciplinary, and Transdisciplinary Approaches in Collaboration

A Thesis submitted in partial satisfaction of the requirements
for the degree Master of Fine Arts

in

Theater and Dance
(Design)

by

Grady Kestler

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The Thesis of Grady Kestler is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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Chair

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ABSTRACT OF THE THESIS

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Professor Shahrokh Yadegari, Chair

Collaboration, especially in theater, is essential to the creative process and crucial to the development of interesting art. Different types of collaboration exist in different settings each of which produces a unique result. When collaboration exists among a variety of disciplines, the process becomes cross-disciplinary and gives rise to different collaborative methodologies: multidisciplinary, interdisciplinary, and transdisciplinary. For each approach, I provide a detailed definition and describe the role it played in my experiences in the UC San Diego Theater and Dance department.

Chapter 1

Introduction

This work is a collection of observations and experiences from my past three years at UC San Diego pursuing an MFA in Theater and Dance and concurrently pursuing an MS in Electrical Engineering. My education has always been grounded in an interdisciplinary framework beginning with my BA in Music/Interdisciplinary Computing and the Arts. A good portion of my experience at UC San Diego has been about learning to balance two sides of academia: the creative aspects from the arts and the technical aspects from engineering and the sciences. This proved challenging due to the lack of interdisciplinary mentorship at a university level specifically between the arts and engineering. However, I was lucky enough to take courses with Shahrokh Yadegari who was one of the few professors with the same interdisciplinary drive as myself.

In the last year of my undergraduate education, Professor Yadegari invited me to apply to the Theater and Dance department to pursue an MFA in Sound Design. Knowing where my interests lie, we tailored a truly interdisciplinary experience by pushing my technical foundation in Electrical Engineering in parallel with my artistic creativity with theater courses and productions. The course work I've taken and the collaborative experiences I've encountered throughout my time here have influenced me to write about

the different frameworks of group processes.

This thesis is divided into two parts. The first examines each of three frameworks as they have been defined in various fields especially related to the health sciences and medical professions where collaboration of various disciplines is critical in solving new problems. In the second section, I draw parallels of these methods to my experiences in theater and discuss my personal belief of which framework produces the most rewarding experiences and optimal results.

Chapter 2

Frameworks

2.1 Multidisciplinary

The first type of cross-discipline collaboration well-known in research is the multidisciplinary approach. In the health sciences, teams are often composed of a variety of experts such that team members work in parallel but remain within their own discipline with limited or no interaction between each other. The team will attack a common problem from different perspectives [ALB$^+$07][CP06]. More times than not, these teams are formed at the hands of a single leader who has the vision for the group. The leader describes the problem and allows the members to independently find a solution by approaching it from various angles. However, despite the path a single member might find to a solution, the leader still maintains control of the group's goal and has sole reign to declare whether the solution is viable or not.

2.2   Interdisciplinary

In contrast to multidisciplinary research, interdisciplinary research progresses towards a more collected approach. *Facilitating Interdisciplinary Research*, written as a collaboration between the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, is a book focused on providing advice and techniques for people in academia to support interdisciplinary research. In the introduction, it provides a robust definition for interdisciplinary research as it pertains to the sciences and engineering.

> Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice [NRC05].

In this framework, teams are still comprised of experts in a variety of fields and the leader is still in charge of the end result. The difference from the multidisciplinary approach occurs in the methods by which members achieve the goal or solve the problem. Instead of maintaining control of each member's solutions, the leader fosters cross-discipline collaboration between each of the individuals in order to combine various tools and techniques from the different fields and solve the problem in a new way. The result of such collaboration is advancements in the field where the problem exists instead of in the field where the solution is found.

For example, in order to solve a problem in the medical field, a leader might propose a problem to a new team that consists of a mathematician, a biologist, and an engineer. In the multidisciplinary case, each of the three will devise a solution based

on the leader's specifications ultimately advancing the three individual fields. However, because each solution will be specific to a single discipline, the chance of using that solution in other divisions of the medical field are slim. In the interdisciplinary case, the team might uncover a solution that involves a combination of tools and techniques from each discipline. The result might have less impact on each of the individual fields, but the entirety of the medical field could benefit more from such a solution.

2.3   Transdisciplinary

The last collaborative approach comes in the form of transdisciplinary research and can be defined as an extension of interdisciplinary research in which the work is produced under a shared framework. The framework is generated as a result of abstracted ideas and theories that transcend individual, discipline-specific boundaries [ALB$^+$07] [CP06]. The largest difference in the transdisciplinary approach is a lack of a central leader. Instead, decisions developed by the team members while implementing a solution, will ultimately change the nature of the problem.

In post-modernity and the scientific community, the idea of lacking a static and central framework is discussed in topics such as self-organization, complexity theory and autopoiesis. Autopoiesis arises from the biological implications that recursively defined networks, generated as a result of specific constraints, will ultimately redefine these constraints as the network is being composed [MV91]. These networks, if studied from a mathematical perspective, produce complex systems which formulate the heart of complexity theory and non-linear analysis. Independent of the underlying framework, the implications of these networks involve the content of the network being distributed throughout the network connections as well as being a consequence of them [CS99].

Collaboration then can be viewed as a network of individual members working

towards a goal. The problem *derives* from decisions made by the members, while at the same time *informing* the very same decisions. In the case of the example above, the group itself would put forth a problem whose solution only exists as a culmination of theories and methods from the individual fields. As a result, a new framework would be created to find this solution and the original problem could adapt to fit within the new framework.

Chapter 3

Experiences

3.1   Taming of the Shrew(d): A Cautionary Tale

The nature of much of modern theater exemplifies the multidisciplinary approach in the form of a hierarchical process. At the top, the director maintains the overall vision and concept, and propagates ideas to the other members. Any artistic decision made by another individual is filtered through the director before being implemented into the piece. As a result, individual artists stray from making conceptual decisions and instead choose to focus on the technical implementation of the director's concept. While the content being heard or seen might not relate to the designer's conceptual foundation, it will play an important and specific role in the director's vision.

A recent example of this process can be seen in *Taming of the Shrew(d): A Cautionary Tale* directed by Kyle Donnelly, for which I served as Sound Designer. In my initial meetings with Donnelly, I could see that she worked in a multidisciplinary framework where directors have the ultimate decision on whether or not a design choice was used in the piece. Though she respected the designer's insights, she maintained complete creative control throughout the rehearsal process and tech. She made clear what

she wanted and needed those ideas to be implemented in order to achieve her vision. The end result was clearly a child of Donnelly's artistry with little influence from the voice of the designers. As the Sound Designer, I focused on being able to implement ideas Donnelly brought forth in rehearsal. I saw no room for my artistic voice to break through in the piece, despite my trusting Donnelly to have a cohesive vision as the director.

3.2 Lear and Machinal

In theater, the interdisciplinary approach is one that lends itself to a more progressive collaboration. Instead of the hierarchy exemplified in multidisciplinary collaboration, the director is positioned as the heart of the process and assists in the cross-collaboration of designers and actors. In contrast to fostering a separation of disciplines, the director becomes the foundation, supporting the connections and decisions made between other artists involved in the process. Instead of the central concept deriving from the top and controlling the individual decisions, an interdisciplinary process provides motivation and inspiration for the artistic decisions made by designers and actors. The process fosters foundation and support as opposed to filtering and control. Just as sciences rely on a diverse set of tools and techniques developed across disciplines, the process of creating theater relies on various artistries. Specialized areas collaborate to explore new possibilities of the piece, often resulting in the advancement of artistic concepts and technological solutions extending beyond the possible achievements of a single individual.

In my time at UC San Diego, I have worked on pieces that implement an interdisciplinary process. Two such pieces, both directed by Will Detlefsen, were *Lear* and *Machinal*. While both pieces were produced and performed on a much smaller scale the *Shrew(d)*, they were produced in an interdisciplinary fashion. During the first meetings between Detlefsen and I, most of the conversation discussed the content and text of the

piece as opposed to the actual design. Even though Detlefsen had his own vision, I found myself implementing the concepts we discussed instead of the sounds he wanted to hear or images he wanted to see. Because he inspires the designer's decisions in an interdisciplinary mode, everyone is implementing the same ideas. As a result, both plays utilized a variety of elements to convey Detlefsen's vision to the audience. The strength of the performances was not in the individual elements but rather in their cohesiveness.

3.3   Aiis and Head over Heels

Lastly, the transdisciplinary framework in theater is modeled as an ideal collective in which there is no true leader. While a single individual may put forth the original vision for the piece, subsequent decisions from any other artist may influence and alter the original vision. Following in the footsteps of an interdisciplinary process, the newly altered concept can further motivate and inspire decisions of the individual artists. The artistic content derives from decisions made by the individual artists while informing those same decisions. The result of this is an ideal collective of dynamic artists continuously creating and influencing each other and the overall piece.

I have worked on two projects that were implemented using this framework. The first, *Aiis*, was a project between myself and Steven Leffue to create an intelligent improvisation system [LK16]. At the onset of the project, we both had a clear vision of what we were going to produce. He conceptualized the artistic performance of the system while I began to implement it. We quickly found that iterative implementation was necessary to create what we had in mind, but as I implemented and he interacted with it, the end goal began to evolve, redefining the system we were trying to implement. Of course, this also redefined how I would implement the next iteration. In the end, mine and Leffue's expertise in different fields generated a new transdisciplinary framework

from which *Aiis* was born. Since its inception, *Aiis* has been used in performances at UCSD Theater and Dance, as well as in the albums *Futures* released by Rhonda Taylor in 2015 and *A Theory of Harmony* released by Steven Leffue in 2016. This same framework also produced a modified version of *Aiis* that will be used in an improvisation among the intelligent system and members of the International Contemporary Ensemble.

The second piece that utilized the transdisciplinary approach was titled *Head over Heels* and was a collaboration between myself, Leffue, and choreographer Anne Gehman. The piece was a improvisation among Gehman's movement, Leffue on live saxophone, and *Aiis*, extended to generate graphics as well as improvisatory audio. Unlike the process of creating *Aiis*, this performance never started with a central concept. Instead, the three performers would improvise and then we would discuss the outcome of the performance, make decisions, and reiterate through the process again. The final performance portrayed a narrative about man, woman, and machine that none of us had foreseen. In creating the piece as a collective, the performance created its own intentions independent of the members' input.

Chapter 4

Conclusion

From my experiences as a designer, the most rewarding processes with the best results were those that implemented a transdisciplinary framework. Unfortunately, the idealism behind the transdisciplinary approach is often overwhelmed by the realistic nature of teamwork. In order to achieve a transdisciplinary level of collaboration, open-mindedness and insightful creative input are required from every member. Without either of these traits, the team is often divided into a transdisciplinary core with an interdisciplinary or multidisciplinary support. These traits often fall short to the pride of the individual artists involved, and as a result members become overprotective of their work and fail to take conceptual feedback in their artistry. A result of these issues with teamwork is that transdisciplinary processes fail to scale well for larger groups. A piece or project that works well with two or three people becomes increasingly difficult when others are involved.

Another issue with transdisciplinary methods is a false assumption that pre-existing text defines the content of a piece. If one does believe this, then questioning the possibility of transdiscilinary collaboration manifests into ideas such as: Is it possible for the collective to develop a relationship with the content if the content has already

been fixed? Furthermore, if the text is allowed to be modified, is the heart of the text, the true content, dynamic as well? I don't necessarily believe that the text defines the content since plays written hundreds of years ago can be produced today in a variety of ways. I believe transdisciplinary collaboration relies on the individuals involved and their willingness to adapt and change with the content. If these dynamics can succeed, then the content will adjust within the transdisciplinary framework.

My experience with transdisciplinary collaboration and its positive outcomes does not reflect a majority of artistic processes. Theater, especially traditional theater, lives in the interdisciplinary and multidisciplinary world. The director maintains his or her vision throughout the process and works to either motivate and inspire, or filter and control, subsequent artistic decisions. The result is credited as the director's piece, produced with assistance from other parties involved.

In the production of a piece, each artist will have a purpose on the team regardless of the implemented framework. The differences between the frameworks described above comes about in the arrival of each artist's purpose. During a multidisciplinary process, the director has full authority to designate artists to a specific role. The medium of individual artistry will help bring about the director's vision in a unique manner. An interdisciplinary setting provides artists the opportunity to define their own use of medium to support the director's vision. In turn, they define their own role in the production process. Lastly, in a transdisciplinary collective, the individual artistry defines the central vision, and vice versa. Without a central figure, the collective is free to engage with the piece, resulting in conversation between its content and itself.

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