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# The Impact of Julie Thompson Klein's Interdisciplinarity: An Ethnographic Journey

by

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**Abstract:** Throughout 2018 we had the privilege of engaging with Julie Thompson Klein using an ethnographic approach combining interviews via teleconferencing and email exchanges to discuss many aspects of her work with the goal of understanding how she herself views her scholarly evolution over the past five decades. Discussions about Klein's life quickly became intertwined with stories about her work, and the process of capturing details of her intellectual journey resulted in a collection of commentaries in which biography could not be easily separated from review of her scholarly output. In this article, we decided to foreground the richness of the dialogue we have so enjoyed in which there has been a fusion of the two kinds of content, incorporating Klein's reflections to illuminate some of the central themes of her entwined personal and academic trajectories. We have chosen to organize the material into three categories that we see as primary areas of focus for her and her work over the years: interdisciplinary educational activities, contributions to the professionalizing of interdisciplinarity, and discourse on teams. Whenever possible, we quote Klein directly in her own words (printed in italics) to facilitate our overview of these areas.

**Keywords:** collaborative work, digital humanities, interdisciplinarity, Julie Thompson Klein, team science, transdisciplinarity

## Introduction

Throughout 2018 we had the privilege of engaging with Julie Thompson Klein through interviews, casual conversations, and emails to discuss many aspects of her work with the goal of understanding how she herself views her scholarly evolution over the past five decades. We took a standard ethnographic interviewing approach, attempting to capture both artifacts and meaning embedded in the evolution of Julie's nearly 50-year career (Creswell, 2007; Spradley, 2016). Interviews were conducted via teleconferencing through Zoom ([www.zoom.com](http://www.zoom.com)) using a LiveScribe 3 Pen that captures voice recordings and pairs them with handwritten notes ([www.livescribe.com](http://www.livescribe.com)). The digital audio recordings were transcribed using [www.Rev.com](http://www.Rev.com) and then used to reconstruct conversations, capture quotes, and analyze for themes embedded in the data (Maxwell, 2005). In addition, email exchanges were utilized so that Klein could provide written responses to various questions. The line of questioning was semi-structured and partly co-developed through casual conversations about main areas of interest that would later be organized into the written presentation of the data. Member-checking of data was exercised throughout the process and the presentation of data in this article is the result of verification from the participant for inclusion and accuracy (Miles & Huberman, 1994).

Upon the onset of this project, discussions about Klein's life quickly became intertwined with stories about her work, and the process of capturing details of her intellectual journey resulted in a collection of commentaries in which biography could not be easily separated from review of her scholarly output. In this article, we decided to foreground the richness of the dialogue we have so enjoyed in which there has been a fusion of the two kinds of content, incorporating Klein's reflections to illuminate some of the central themes of her entwined personal and academic trajectories. We have chosen to organize the material into three categories that we see as primary areas of focus for her and her work over the years: interdisciplinary educational activities, contributions to the professionalizing of interdisciplinarity, and discourse on teams. Whenever possible, we quote Klein directly in her own words (printed in italics) to facilitate our overview of these areas.

## Interdisciplinary Educational Activities

The 1970s and 80s were a time in Klein's life when she explored the boundaries of her own disciplinary experiences in English studies. This era of experimentation propelled her work into the realm of interdisciplinarity,

the sphere central to the whole body of work for which we have come to recognize her today. In the late 1970s, she was a Visiting Foreign Professor at Shimane University in Matsue, Japan. She stated that this appointment was a *one-year leave from [her] standing appointment at the English Department at Wayne State*. Klein recalls this year fondly, as it *spoke [to her] professed sense of adventure*. Her Fulbright a decade later, at the Tribhuvan University in Nepal, along with her assignment as an Academic Specialist for the U.S. Information Agency in Kathmandu, is another example of experience that appealed to her adventurous spirit. Klein reflects,

*My Fulbright was in an English Department, so it was based strongly in language and literature. My colleagues were interested in developing American studies, including a master's degree, but resources were short and teacher preparedness another problem. The traditional curriculum was longer on rote learning than innovation.*

Her desire for adventure was not limited to world travel. She began to travel into uncharted territories on the home front, as well. The most significant activity from this era and the one that most clearly affected Klein's scholarly trajectory was the launch of the Wayne State University (WSU) Interdisciplinary Studies Program (ISP) (first known as the University Studies/Weekend College Program or USWCP). It was an outlet that allowed Klein to break free from some of the less experimental curricular trends of the time, thus enabling her to dedicate her time to more innovative endeavors. Klein's work on this program, beginning in the mid 70s, launched one of the main themes of her career: designing interdisciplinary education. The program served a population of adult learners with an undergraduate curriculum modeled on curricula for interdisciplinary general education and liberal arts programming that had begun to be offered by some other institutions, with courses drawn from humanities, social sciences, and science and technology, followed by a senior capstone year. This curriculum reflected some of the trends that were apparent in new interdisciplinary fields such as "black, women's, ethnic, environment, urban, science, technology, and cultural studies" (Furtado et al., 2009, p. 69). These developments foreshadowed a growing interest in interdisciplinarity as a means of grappling with societal and cultural issues of the day, an interest Klein soon came to share.

In the wake of the university's termination of the Monteith College program, established in 1959 and closed in 1973, the innovative USWCP program was designed for working adults in the Detroit metro area. The program utilized an almost exclusively open enrollment policy, and those initially enrolled were predominantly African American. It continued the mission of the Monteith program by offering

alternative, interdisciplinary, humanistic curriculum-centered undergraduate degree programs [like those usually offered to] traditional college-aged students...to a self-selected group of [non-traditional] students ideally suited to a challenging interdisciplinary curriculum that [focused] on historical to contemporary issues, problems and topics. (Furtado et al., 2009, pp. 68-69)

Later, the faculty also developed a master's program modeled on other programs offering interdisciplinary liberal education to post-graduates. Eventually, to reflect greater recognition by the university, the program dropped the "Weekend College" label, was renamed the Interdisciplinary Studies Program (ISP), and gained department designation.

Over the course of these early years in Klein's career, despite continuing questions about the place of interdisciplinarity in undergraduate degree programs and the value of the contributions of faculty who dedicated time to interdisciplinary studies, Klein and others were dedicated to advancing integrative approaches to fulfill the "urban mission" of the university. As the status of other university priorities increased, however, that of its "urban mission" began to wane. Interdisciplinary studies programs and faculty members, at this point in time, at Wayne State and even on liberal arts campuses, did not escape intense scrutiny and skeptical critique, according to Klein:

*The USWCP and its faculty were disrespected because of the near open-enrollment status, bias against interdisciplinary general/liberal education, and, many faculty believed, its dominant African-American population despite institutional lip service to an "urban mission." Our prioritizing of teaching also paled in comparison to tenure and promotion policies favoring research and publication in a R1 research university.*

Despite the scrutiny and negative attitudes, Klein believes the interdisciplinarity of the ISP had an impact not only in the application of interdisciplinary studies to real-world local problem solving, but also in re-characterizing the relationship between instructors and students. The program made the educational experience more student-centered, emphasizing collaborative course design, active learning, and learning based on multicul-

turalism (Furtado et al., 2009). Such contextual learning, based in the real experiences of adults and their local community involvement, became a hallmark of the program and relationships were forged with labor unions, public works, private industry, government agencies, community service organizations, and in particular the State Prison of Michigan in Jackson, MI. This synergy among interdisciplinary thought, curriculum development, and application of learning in community settings was an important factor in shaping Klein's subsequent thinking about the confluence of academic and community perspectives for understanding complex social problems. It was a vehicle to continue to create and promote interdisciplinarity in the context of active learning course design. These developments, though not always appreciated by all, were how innovative thought became the impetus for innovative education:

*Since we created the curriculum from the ground up our work was heavy on curriculum development and teaching, in a research university that did not value that kind of work for tenure and promotion. Over time we developed a roster of courses but also kept designing new ones for approval in the university's revised general education program and the new ISP master's degree. The era of curricular reform was an initial "wind at our backs" but so, more profoundly, was a university president's introduction of a new College of Lifelong Learning that would serve "adults" in the student population and offer courses in locations throughout the Detroit Metro area (and even in Jackson prison). The majority of early students were also veterans who had educational benefits at the time, resulting in a high number of students but uncontrolled growth at times...[Subsequently], there was a heightened focus on instrumental interdisciplinary problem solving in research. Wayne State's later priorities are no surprise given national trends. There was never a focused commitment to a research agenda. The interest in interdisciplinary problem solving was centered on study of societal problems, especially in the social science division.*

The program and the work conducted at the ISP were a result of the reform era of educational experimentation during the 1960s and 1970s that bolstered interest in the usefulness of interdisciplinarity as a means of solving problems although, Klein notes, the Wayne State program *did not engage to any significant degree in the kind of hands-on problem solving [that characterizes some] curricula today*. After enjoying a rich tenure of 34 years dedicated to interdisciplinary education, the department was dismantled in 2007. The program itself continued briefly; however, despite its long history

of high local impact and relevance, it was also eventually discontinued:

*Departmental status was demoted to program status prior to termination by Wayne State University at a time when the university was courting a “better quality” of students. Colleagues and I [Furtado et al., 2009] joined in publishing an analysis of the program’s history and reason for termination.*

As Klein and her colleagues explained in their analysis, several factors beyond the financial constraints the university was struggling with contributed to the downfall of the ISP. There were new cuts in veterans’ educational benefits that had supported many of the local enrollees. The program experienced reduced enrollment over the 80s and 90s. Moreover, though no cause of the downfall, there was a shift in composition of the student population from blue-collar working adults to more white-collar management personnel from key industries, such as telecommunications, the insurance industry, and the public sector.

### **Contributions to the Professionalizing of Interdisciplinarity**

Klein has stated that her scholarly interest in interdisciplinarity arose from teaching in the Wayne State interdisciplinary program, experience that served as a foundation for ongoing critical analysis of the role of interdisciplinary and, later, transdisciplinary studies in higher education. Intellectual questions surrounding the nature of interdisciplinarity piqued her curiosity and led to her decades-long program of research. Her efforts developing educational frameworks that incorporated interdisciplinarity resulted in a series of seminal publications that aimed to encourage change in the structuring of modern university programming.

In her *Interdisciplinarity: History, Theory, and Practice*, published in 1990, Klein explored the broad background of the concept of interdisciplinarity and its application. Klein (1990) emphasized the importance of definition and the description of practices and ultimately, the relationship of interdisciplinarity to disciplinarity as it had come to be understood in the latter 20<sup>th</sup> century.

In her 1996 book, *Crossing Boundaries: Knowledge, Disciplinarity, and Interdisciplinarity*, Klein developed her early thoughts about boundary work, the differing claims on the definition and value of interdisciplinarity, and a conceptual framework for understanding, studying, and supporting interdisciplinary practices. Klein (1996) also presented a comprehensive account of developments in two major areas: “Critical Interdisciplinarity,” which interrogates the existing structures of knowledge and education with

the aim of transforming them, and “Instrumental Interdisciplinarity,” which typically focuses on pragmatic problems that need solving. She also explained the increasing complexity and dynamism of interdisciplinary and disciplinary relationships while presenting updated case studies of interdisciplinary fields, interdisciplinary genealogy in literature studies, and growing related movements in science and technology, including biomedicine and engineering (Klein, 1996). Now, in 2019, Klein notes that the field has evolved to such an extent that

*[the term “interdisciplinarity”] is no longer adequate to describe the plurality and complexity of crossing boundaries today. Even though the term continues to be an umbrella label, research and education are crossing divisions of not only disciplines but also interdisciplinary fields, and sectors of society including government, industry, and local communities. “Boundary work” is a composite label for claims, activities, and structures by which individuals and groups work directly and through institutions to create, maintain, break down, and reformulate between knowledge units [Klein, 2019].*

Her 2005 book, *Humanities, Culture, and Interdisciplinarity: The Changing American Academy*, examined historical contexts and perspectives on interdisciplinary theory and practice (including formation of the generalist model and new interdisciplinary conceptions, changing internal academic and external influences, and the expanded presence of interdisciplinarity as a field of study). It included case studies (with an updated account of literary studies plus studies of visual and aural domains typically included in literary analyses), and it discussed the interdisciplining of the study of America (in fields of American, black, and women's studies with a comparison to Canadian studies) (Klein, 2005).

With regard to these books, Klein states,

*The methodology of [the] three books is itself interdisciplinary, combining historical, rhetorical, and sociological analysis. Historiographical analysis uncovers genealogies of origin, benchmark events, periodization, and tensions between continuity and change. Sociological analysis examines how knowledge is codified in conditions of group membership and sanctioned practices. Rhetorical analysis dissects the claims by which people construct a field, patterns of consensus and difference, and the ways keywords and taxonomies structure hierarchies of value. These methods are not isolated. In the manner of Michel Foucault's [1969] genealogical studies of knowledge, historiography considers how discursive objects, concepts, and strategies produce regularities, rules, and*

*unities that are challenged by ruptures, re-figurations, and transformations. In the manner of Pierre Bourdieu's [1993] studies of the academic sphere, questions about power, conflict, and change arise in tracking the production, circulation, and institutionalization of knowledge. And, in the manner of Tony Becher's [2001] studies of disciplinarity, tracing historical and rhetorical patterns also entails an anthropological interest in how influential figures, artifacts, and literature establish cognitive authority, reputational systems, cultural identity, and symbolism.*

We asked Klein to elaborate on how the works of Foucault (1969), Bourdieu (1993), and Becher (2001) influenced her research and the development of her theoretical constructions, particularly in her later writings:

*Great question. My colleagues in humanities were shocked as I moved more toward social sciences to explain questions of power in institutionalizing interdisciplinary practices. Foucault helped me explain the politics of disciplinarity, Bourdieu patterns of power in the academy, and Becher a more heterogeneous understanding of disciplinary formations. This... reminds me of a conversation I had with Joseph Kockelmans once. He commented [that] the figures I cited were not the same as he would have chosen to frame interdisciplinarity, given his background as a philosopher who grounded thinking about interdisciplinarity in the work of philosophers. I reached more broadly across other theories and practices. To cite another example [of what others have done], the Association for Integrative [and, latterly, Interdisciplinary] Studies (AIS) has continued to prioritize the thinking behind Allen Repko's [Repko & Szostak, 2016] textbook for [those undertaking] individual student projects, which frames [a] definition of interdisciplinarity grounded in the concept of common ground emanating from interdisciplinary teaching and curriculum development. I reached more widely into research and team-based collaboration. Doing so expanded my purview to include the European-based notion of trans-sector transdisciplinarity and the U.S.-based notion of team science, here again underscoring the heterogeneity of interdisciplinarity while distinguishing my descriptive approach from prescriptive ones. I would not point to [Foucault, Bourdieu, and Becher] specifically as much as I would monitoring growing priorities of what I have defined as "Critical Interdisciplinarity" versus "Instrumental Interdisciplinarity": pitting critique and problem solving against each other as motivations. I carried earlier questions of power*



*and definitions of disciplinarity into expanding arenas of inter- and trans-disciplinary discourse.*

*I have written about “Critical Interdisciplinarity” in books that post-date the 1990 initial study, including pertinent sections. . .of Crossing Boundaries: Knowledge, Disciplinarity, and Interdisciplinarity [1996] and Interdisciplinarity: Interdisciplining Digital Humanities; Boundary Work in an Emerging Field [2015], and my chapter in the 2017 Oxford Handbook of Interdisciplinarity [2017]. It is also a major thread in my forthcoming book on boundary work [2019].*

So, for Klein, what is the unfinished agenda of the discourse on higher education and interdisciplinarity? The agenda is not so much “unfinished” as it is “evolving,” an argument Klein presented in Paris in 2018 in a keynote address on “Beyond Interdisciplinarity: Changing Scales and Spaces,” at a conference on “Politiques et pratiques de L’interdisciplinarité”:

*I ground [the agenda] in linguistic understanding of the changing semantics of meaning in use of words. I am working right now with a number of calls for future scholarly focus that might be worth embellishing. They reinforce the current heterogeneity, relationality, and intersectionality of the core concept. This expanded thinking is at the heart of my new book on boundary work [2019], where I emphasize understanding the nature of cross-disciplinary work by “listening” to the heterogeneity of practices and interests. There are cross-sections but also significant differences such as the imperative of pragmatic problem solving versus critique and versus epistemology. Heterogeneity challenges universalist theories that posit a “true” or “genuine” meaning of interdisciplinarity in favor of a spectrum. Relationality and intersectionality call attention to shared imperatives and alliances across fields, for example, problem solving in health and in environmental research as well as shared cultural agendas of cultural studies, women’s studies, post-colonial studies, and other such fields. Intersectionality also recognizes that the academy is not the sole space of cross-disciplinary work. It intersects with interests in government, business, and the public sphere [2018a].*

For more than five decades, Klein has been particularly committed to connecting and disseminating the diversity of ideas around interdisciplinarity. Consequently, she has been a key voice in shaping and linking many communities of practice that have emerged around interdisciplinarity. As she

developed her expertise in interdisciplinary pedagogy in the 70s and 80s and beyond, a multitude of such communities were working to establish norms for interdisciplinary studies as a focused area of study and not just a philosophical method in designing education. Klein's publications, even those that preceded the big book in 1990, provided much guidance in this area, helping to establish best practices for interdisciplinary work in teaching and research. Klein also devoted countless hours to networking and interfacing with scholars and practitioners dedicated to the philosophy of interdisciplinarity and the development, administration, and evaluation of interdisciplinary programs in higher education (Doty & Klein, 1994; Klein, 1999, 2002; Lenoir & Klein, 2010).

Klein's early work in the field came at a time when the inklings of the scholarly field of interdisciplinarity were being pulled together. AIS (the Association for Integrative Studies as it was then) began to form as the 80s approached, and by 1979 an initial cast of characters had created the association, built around sharing best practices for interdisciplinary pedagogy. In 1983, Klein joined the association. In one of its initial editions, the journal of the association (*Issues in Integrative Studies* as it was then) served as an outlet to disseminate an important piece by Klein titled "The Dialectic and Rhetoric of Disciplinarity and Interdisciplinarity" (Klein, 1983). Reflecting on that first piece she wrote for *Issues*, Klein says,

*You could call it [my] first publication within a dedicated community of practice. To recall, I started writing about theory and practice of interdisciplinarity because I was curious about their legitimacy, from both intellectual and political standpoints. Being in a disrespected ID program for adult learners, with a strong teaching mission and majority African-American population, was certainly a prompt in a research university. We were regarded as pariahs at the time, all the more striking given interdisciplinarity became a valued priority decades later (and I more valued as a result because of my expertise).*

By 1984, Klein was involved in the leadership of AIS as an at-large member of the board of directors. In succeeding years, she served as vice president, president-elect, and president in 1987-88. Of Klein's role in the early association (as in the many years since), her long-time colleague at Wayne State and in AIS, Roz Schindler, has commented,

*Her networking, initiating, consulting, editing, and supporting of interdisciplinarians and interdisciplinary programs have been just as important as her research, even though they often take place out of the limelight....A major aspect of her contribution to AIS has been networking with other associations, organizations, and*

groups, not just individual scholars. (Schindler, 2014)

Of course, Schindler did also comment on the importance of Klein's networking with individual scholars, both inside AIS and out. There's no doubt that her overall approach to the formation of knowledge is highly collaborative, between individuals as well as groups, and across institutional types, national boundaries, and divergent perspectives, including fledgling academics as well as seasoned scholars. And the vast majority of these efforts have been highly individualized, involving face-to-face discussions, phone calls, or emails, and requiring an enormous amount of time and effort (Schindler, 2014). If the Association for Integrative Studies (which became the Association for Interdisciplinary Studies in 2013) has had a wide impact on the evolution of interdisciplinarity, helping to establish best practices for interdisciplinary pedagogy and curricular design in addition to establishing a community for sharing resources, in turn influencing a plethora of degree programs, Klein's efforts have had much to do with that impact. AIS has twice recognized the value of her work with its highest awards, the Boulding Award in 2003 for outstanding long-term contributions to interdisciplinary studies and the Newell Award in 2014 for exemplary service to the association.

It is perhaps because Klein is a true interdisciplinarian that her impact has been as broad-reaching as it has. She has brought people with varied expertise and interests together, and her service has spanned communities that might not have otherwise had much overlap. As Schindler has further explained,

[H]er consulting on interdisciplinarity was not limited to the U.S. but was worldwide....Nor was her consulting focused solely on general education, or even on education as a whole; it also included interdisciplinary research and administration, and emerging interdisciplines as well. In these diverse consultations, she has drawn not only upon the work of AIS but also of GRIP – Group for Research into the Institutionalization and Professionalization of Literary Studies (focused on disciplinarity), HASTAC (focused on digital humanities), INTERSTUDY (focused on interdisciplinary research), Science of Team Science (focused on interdisciplinary team research), td-net (focused on transdisciplinary studies), and other professional groups in which she gained prominence over the last three decades. (Schindler, 2014)

In the 2000s, Klein's impact on interdisciplinary studies worldwide became increasingly visible in a variety of contexts. Klein's newer work was gaining influence in multiple fields and communities of practice. And along

with greater recognition of the value of her previous work, it generated national and international awards and accolades that highlighted her passion, commitment, and dedication. Besides the aforementioned top awards from AIS, these honors included her induction into the Wayne State Academy of Scholars; her receipt of the College of Urban, Labor, and Metropolitan Affairs Teaching Award; her receipt of an award recognizing her graduate mentoring; her receipt of the Joseph Katz Award for Distinguished Contributions to the Practice and Discourse of General and Liberal Education; and her visiting distinguished scholar appointment in the Centre de recherche sur l'intervention éducative, Université de Sherbrooke, Quebec.

As a testament to the widespread influence of her ideas (the extension of her educational pioneering), Klein was invited to share her work with many different audiences across a variety of venues, including the Task Force on Accreditation (of AIS) and the National Task Force on Integrative Learning (of AAC&U). Speaking engagements around the world, as in Canada (Sherbrooke Institute), Switzerland (Mutual Learning Session on Theory and Method), and Mexico (Seminario Internacional: Diálogos Sobre la Interdisciplina Observatoire des Réformes Universitaires or ORUS) served as vehicles for her influence to reach an international audience. This period of Klein's life allowed her to further explore the potential of her scholarship, too, propelling the evolution of her own thoughts in which she continued to make novel connections:

*I have learned from every experience, not just performing related duties but testing my evolving ideas with different audiences. The context at Sherbrooke, for example, included a didactic tradition of school education as well as medical practices. Later as a Visiting Fellow at University of Michigan Institute for the Humanities and as a Mellon Fellow and Visiting Professor of Digital Humanities my focus was on the emerging field of digital humanities. The keynotes [associated with these invitations] have also spanned facilitating institutional practices, designing and teaching education programs of varied types from general/liberal education to specific interdisciplinary fields, and supporting research agendas increasingly focused on societal problems.*

Klein's dedication to intertwining various perspectives became increasingly visible as the 2000s progressed and as her work progressed, continuing to impact key interdisciplinary fields beyond interdisciplinary studies, most notably digital humanities and the Science of Team Science (SciTS). In 2005, in the first full-length investigation of the triangulation of the three keywords found in the title of her book *Humanities, Culture, and Interdisci-*

plularity: *The Changing American Academy* (Klein, 2005), Klein presented a “new interdisciplinarity” in humanities, as proposed by Kaplan and Levine (1997), a version of ID that questioned not only the canon and curriculum but also the larger organization of knowledge and hierarchies that govern both intellectual and political lives. When we asked her about the changing landscape of digital humanities and its connections with interdisciplinarity, a subject she addressed at length in her 2015 book, *Interdisciplining Digital Humanities: Boundary Work in an Emerging Field*, Klein responded,

*My goal was to test the widespread claim that digital humanities is interdisciplinary by examining the boundary work of establishing, expanding, and sustaining a new field. [The] five years [between now and my research for my last book on the subject] is a short time to gauge change, despite the widespread rhetoric of “revolution” and “transformation.” Yet, digital tools, concepts, and environments have continued to expand. Dating from computational linguistics, electronic text production, and digital collections in the mid-20<sup>th</sup> century, the field of digital humanities underwent a sea change with the advent of the Internet. It now encompasses new digital-born objects, forms of scholarship, and publication, new areas such as gaming studies, critique of the impact of the computer on behavior and culture, and a new rhetoric and epistemology of Making.*

*Yet, challenges to sustainability, infrastructure, and preservation of digital content continue. They stem from the weakened funding climate in humanities, conservative policies for publication as well as tenure and promotion, lack of common standards and evaluation criteria, resistance to interdisciplinary innovation, and uneven development across disciplines, fields, and institutions. Differing priorities also occur across instrumental work focused on producing tools and critiques of digital media and culture. A large part of my research, then, tracked trajectories of different histories, methodologies, theoretical positions, schools of thought, and institutional locations. Keyword clusters were valuable means of defining both their particularities and their relationalities. I also examined the dynamics of integration and collaboration in trading zones of expertise and communities of practice. Finally, in answer to the question of whether digital humanities is an interdisciplinary field, I concluded a triple efficacy is unfolding across disciplines, interdisciplinary fields, and professions; within and across their*

*institutional locations; and within and across all organizations and groups that are grappling with implications of digital technologies and new media.*

In further exchanges about interdisciplinary and digital work, we asked Klein questions about how the changing academic environment along with the unchanging inherent constraints in the American education system affects work in those areas and the need for “interdisciplinary spaces”:

*I like your use of the term “interdisciplinary spaces” since the contexts in which interdisciplinary and digital work occur are numerous. My 2010 book *Creating Interdisciplinary Campus Cultures: A Model for Strength and Sustainability* [Klein, 2010] explored many of the challenges scholars face and strategies for responding. More recently, Holly Falk-Krzesinski and I [Klein & Falk-Krzesinski, 2017] co-authored an article on framing promotion and tenure for interdisciplinary and collaborative work. We cite numerous studies and models including . . .the University of Southern California revised documents on counting digital scholarship as well as related policy statements of the Modern Language Association (MLA) and the American Psychological Association (APA).*

We should note that the 21<sup>st</sup> century has seen an acceleration of “interdisciplinary spaces” and education programs, especially in international, women’s, ethnic, and biomedical and environmental studies, though we might also note that American cultural studies have lacked the same growth (Brint, Proctor, Murphy, Turk-Bicakci, & Hanneman, 2009).

Of course, broader questions exist about the future of interdisciplinarity in higher education. We asked Klein to address these questions, too, and she was quick to emphasize that, in spite of the challenges involved, such as those she explored in her 2010 book and has explored since, there are exciting new directions on the horizon and much hope for the future:

*In her book *The New Education*, HASTAC co-founder Cathy Davidson [2017] highlights both the challenges facing higher education and strategies for responding. The challenges include adjunctification of teaching labor accompanied by deprofessionalization of the faculty, rising tuition costs and student debt, narrow prioritizing of STEM and reductive skills training, corporatization of the university, and extremes of technophobia and technophilia. Formidable though the challenges are, Davidson argues we are at a tipping point for change, supported by models and strategies in a variety of institutions. Their common denominator is moving beyond narrow skills training to help students navigate their futures*

*by understanding the complexity of the world they live in, coping with change by learning how to learn, steering between technophilia and technophobia, and cultivating a new literacy grounded in skills of deep and critical thinking, communication and collaboration, [and] cross-cultural understanding. They are capable of having “palpable impact,” though not by jettisoning everything but by keeping what works well while shedding inherited features and practices that make it difficult to prepare students for [the] future: “unbundling” and “rebundling” practices.*

Klein further notes,

*Other HASTAC members have...fostered two powerful concepts that are exciting: “mobilizing networks” and “spatializing practices.” In The Future of Learning Institutions, Davidson and David Theo Goldberg [Davidson & Goldberg, 2010] proposed a definition of institutions as “mobilizing networks,” characterized by traits [Davidson] echoes in her new book: including horizontal structures that flatten expert authority, a shift from predetermined expert authority to collective credibility, decentering pedagogy, networked learning through social engagement and cooperation, and [a] conception of learning based on connectivity and interactivity. HASTAC colleague Anne Balsamo [Balsamo, 2011]...also echoed Michel de Certeau in distinguishing “place” from “space.” A place such as a university or school has stable boundaries and a fixed location. Space [like the “interdisciplinary space” discussed above] is “a practiced place” created by actions Balsamo calls “spatializing practices.”*

## **Discourse on Teams**

Klein's contributions in both interdisciplinary education and cross-disciplinary theory and application, as well as her emphasis on communication, naturally have positioned her to become an important voice in the emerging field of team science. The Science of Team Science (SciTS) community is dedicated to thinking about how teams tackle complex and global problems using a variety of scholarly insights about team dynamics and functions. The field is grounded in psychology, organizational science, the humanities, social psychology, management, leadership, and philosophy, among other disciplines, grounding that makes it prime for applying the collaborative brand of interdisciplinarity that Klein advocates. She has consistently contributed to the SciTS discourse through keynote addresses, panel participation, pre-

sentations at SciTS conferences, and publications over the past decade. In addition, she joined the growing field of scholars instrumental in establishing the key clearinghouse for matters related to SciTS as a founding editorial board member of the virtual Team Science Tool Kit ([www.teamscience5.cancer.gov](http://www.teamscience5.cancer.gov)) hosted and managed by the National Cancer Institute:

*My involvement in the Team Science conferences dates from early meetings at Northwestern University (2010). Prior to that I was invited to the ground-breaking conference on Team Science in Bethesda (2006), which subsequently formed the basis of a special issue of the American Journal of Preventive Medicine containing my article on evaluation [Klein, 2008]. My membership on the planning committee dates from 2011, also the date of a co-authored article on mapping a research agenda for the field. [Falk-Krzesinski et al., 2011]. In addition I was also a founding member of the Toolkit Editorial Board (2012) and did a media review of [www.TeamScience.net](http://www.TeamScience.net) for the journal Clinical Anatomy the same year [Klein, 2012]. More recently, I have a co-authored article on evaluating interdisciplinary and collaborative research in Research Policy [Klein & Falk-Krzesinski, 2017].*

*This [subject] reminds me of how often I find myself cross-secting organizations and networks that invoke inter/transdisciplinarity but not in a fully informed matter. I'm thinking of someone who heard an address I gave at SciTS in Phoenix. The person had argued earlier [that] we do not need to spend any more time talking about transdisciplinarity, but acknowledged not knowing a lot of the historical relationship of inter/transdisciplinarity and collaboration. Sigh....*

Of course, and thankfully, many involved in *organizations and networks that invoke inter/transdisciplinarity* do know a lot of the historical relationship of inter/transdisciplinarity and collaboration. By the late 20<sup>th</sup> century interdisciplinary research and its impact on complex problem solving had become a stabilizing element that in turn informed the emerging field of team science as it expanded from the beginning of the 21<sup>st</sup> century. A transcendent transdisciplinarity became associated with the team science movement as new frameworks were developed for health and medical research, along with an emphasis on joint problem solving between academia and stakeholders in a number of other social sectors. An emphasis on engagement in problem solving, such as that popularized by Swiss and German environmental and sustainability scholars of the 80s and 90s, stressed the real



life problematizing and the co-production of knowledge between academics and social actors.

Klein describes this development:

*The term ["transdisciplinary"] had limited circulation at first but proliferated in the late 20<sup>th</sup> century. It is now a descriptor of broad fields and synoptic disciplines, a team-based holistic approach to health care, integrated curriculum design, and a general ethos. At present three major discourses appear. The first discourse – Transcendence – has moved beyond the historical quest for unity of knowledge. Reviewing the history of transdisciplinary discourse, philosopher Joseph Kockelmans [1979] concluded it has tended to center on educational and philosophical dimensions of science. In contrast to the historical principle of unity, current discourse of transcendence accepts plurality and diversity, a value prominent in the Centre International de Recherches et Études Transdisciplinaire. It is advancing a new universality of thought and type of education replacing reduction with a principle of relativity that is transcultural and transnational. In addition, new synthetic paradigms have emerged, notable among them general systems theory, post/structuralism, neo-Marxist and feminist theories, cultural critique, and sustainability.*

*In the late 20<sup>th</sup> century the discourse of Problem Solving became more prominent in two developments: a form of "transcendent interdisciplinary research" associated with the team science movement, fostering new methodological and conceptual frameworks in health and wellness, and joint research and problem solving with stakeholders in society. The latter was evident in a new connotation of TD evident in the late 1980s and early 1990s in German and Swiss contexts of environmental research. Problems of the "lifeworld" took center stage and were subsequently coupled with the idea of "co-production of knowledge" by academics and stakeholders in the private and public spheres. Gibbons, et al. [1994] called further attention to the discourse when they proposed [that] a new mode of knowledge production had emerged. An older Mode 1 form of knowledge production – characterized by hierarchical, homogeneous, and discipline-based work – is being supplanted by a newer Mode 2 – characterized by complexity, non-linearity, heterogeneity, and transdisciplinarity.*

*[A] third discourse – Transgression – is a multi-layered critique that interrogates the existing system of knowledge and education. It is prominent in interdisciplinary humanities, critiques of disciplinary, socio-political movements for change that catalyzed new interdisciplinary fields, and a widening discourse of human rights accountability. The three discourses are not airtight, however. The imperative of Transgression is also evident in problem solving, in the difference between solving problems for the purpose of product development and seeking democratic solutions to controversial problems such as risks of technological modernizations such as nuclear power plants. The latter moves beyond traditional “reliable scientific knowledge” to advance “socially robust knowledge” fostering new partnerships between the academy and society in the agora of public debate [Nowotny, Scott, & Gibbons, 2001]. This complexity implies not only changes in disciplinary knowledge production. It also promotes inclusion of Western science and traditional ecological knowledge in a cooperative and contextualized rather than hegemonic form of knowledge.*

As the field of team science coalesced during the first two decades of the 21<sup>st</sup> century, Klein’s work tracing the evolution of interdisciplinary thought and her focus on collaborative knowledge creation, a key tenet of the Science of Team Science, has provided insights that have become important to the field. For her, SciTS has been a natural outlet that combines her previous experiences with and interests in mapping typologies of interdisciplinary research, collaborative problem solving, and the philosophical and applied reasoning of interdisciplinarity with the evidence-based study of science teams. Like the work of those involved in the Science of Team Science, Klein’s theory building and its application to real world problem solving draws on often unrelated disciplines all of which strive to arrive at similar goals with differing methodological and epistemological approaches. When asked for her view of how she fits in the SciTS community and how her scholarship contributes to the goals of Team Science, Klein states,

*My “fit” is three-fold. First, team science is not only collaborative but often interdisciplinary in nature. Since my expertise is inter/transdisciplinary research and education, I see my contribution as informing and enhancing thinking about those concepts in the network. Second, I work on an international scale and in fact organized the first panel on international perspective at a SciTS meeting in 2012. Third, I am a humanities professor, so am committed to enlarge the scope of methods and contexts for collaborative work*

*to be inclusive of humanities and arts.*

Klein's contributions do not always align with those of others in a field that is heavily populated by individual and social psychologists, management and leadership specialists, policy makers, and sociologists. Nor do all in the SciTS community agree that typology and definition are important aspects of the thinking she shares. Inter- and trans-disciplinary models for team science that Klein has propounded have received varying levels of support in the team science community. However, she continually strives to encourage connections between fields and advance the causes of team science. She says,

*Inter/transdisciplinarity has been a natural alignment of interests [with Team Science], even though SciTS continues to adopt one definition [of the term and practice] without accounting for different connotations. [In particular] it also minimizes a connotation of collaboration prominent in the international Network for Transdisciplinary Research (known as td-net), engagement of stakeholders in society in the actual research process. Humanities has also traditionally been outside the purview of thinking about team "science," even though there is a new openness today to inclusion [of humanities disciplines] while still not appreciating collaboration is also an "art."*

When asked about the role the Science of Team Science has played in the development of her own personal research, Klein responded,

*Team Science has not shaped my personal research as much as represented an opportunity to think more deeply about inter- and trans-disciplinary collaboration, leading to literature I had not read in the past but now reference when relevant. The most direct example [of the way this deeper thinking has enriched my own research and thence my work with others] was my work as Faculty Fellow for Interdisciplinary Development in the Division of Research at Wayne State University. The Division was prioritizing team science at the time, so my expertise in this area was of value in consultations with campus teams and professional development workshops.*

Klein is clearly committed to the establishment of team science as a professionally and academically recognized field. Her involvement as a director of the board of the International Network for the Science of Team Science (INSciTS) as of 2018 is a testament to her dedication to the field – and a testament to the extent to which most of those in the field do welcome her views. Klein believes that advancing team science is about establishing

strong core relationships and expanding the scope of science to include more than is commonly associated with SciTS, challenging scientists to incorporate multiple methods and approaches that reach beyond traditional STEM science to include humanistic and art forms in knowledge integration. Klein comments,

*The greatest challenges [in establishing TS as a respected field] involve organizational strength and credibility in inter- and trans-disciplinary communities of practice. Meeting the first challenge will require not only a strong INSciTS board and enlarged membership but also a concerted effort to enhance visibility and legitimacy in the crowded landscape of related interests. Extending from the last challenge, it is crucial to position the organization strategically in multiple communities that share related interests while bridging their discourse and that of team science, including organizations that posit criteria for status as an “interdiscipline.” Continued use of the term “science of...science” will narrow perception of the value of our work further over time.*

In 2016, Klein was the recipient of the Science of Team Science Recognition Award for her distinguished contributions to the field of SciTS. On that occasion, longtime friend and colleague Dan Stokols, a past recipient, provided an overview of her long-standing impact in the field of SciTS and the many other fields she has impacted (Stokols, 2019). The carefully crafted depiction of Klein’s stellar attributes describes her as a force within these multiple fields and provides a fitting synopsis of who she is as a model scholar and integrating force. [Note that readers of this journal will find Dan Stokols’ remarks reprinted in this volume.]

## Conclusion

For five decades, Julie Thompson Klein has documented, interrogated, and pushed the boundaries of scholarship in higher education, interdisciplinarity, digital humanities, team science, and countless other fields. She has personally connected scholars across disciplines, across communities, and across the world. There is no doubt that her influence is wider than what we can describe in these pages or indeed what others can describe in this volume. Rather than attesting to that influence by merely summarizing her career, we have adopted an ethnographic approach, using interviews via teleconferencing and e-mail exchanges to weave just a few of its many historical threads with reflections from Klein herself on the motivations behind her work and the trajectory of her ideas over the many years of her career

thus far. Her motivations include a passionate dedication to changing and impacting the world. And her scholarly work has been not only intellectual but also deeply personal. As authors, we feel that we have not done justice to her total contribution to and impact on both theory and practice in interdisciplinary studies and the many other areas where she has made a difference. However, we trust that we have been clear about the admiration we have – and share with so many – for this generous colleague and friend.

**Biographical Notes:** GAETANO R. LOTRECCHIANO, EdD, PhD, is President, International Network for the Science of Team Science. He reports the following. As doctoral students often do, I was waiting for that “grand” idea that would magically transform into a dissertation topic that would not only be novel but could also easily be completed within my already shortened academic career. As one who already had a PhD in Ethnomusicology under my belt, I knew enough to know that a dissertation was something one needs to start and more importantly *finish* within a reasonable amount of time. While I was working toward my EdD in Human and Organizational Learning, an instructor once asked a group of us “What really intriguing topical area do you plan to pair with a real problem worth researching?” The small group of students uttered some same-old-same-old topics like “resilience,” “organizational silence,” “executive training,” and a number of others, all of which drew from our professor a less than excited stare. I, on the other hand, had just finished reading Nicolescu’s *Transdisciplinary Manifesto* and Thomas Kuhn’s *Structure of Scientific Revolutions* and was cautiously interested in this notion of “transdisciplinarity” (a topic I ardently blurted out). My professor, a disciple of Karl Weick, asserted “Now that’s exciting” and he quickly sent me off to find everything I could on the subject. Needless to say, Klein’s work made up a pretty substantial part of my late night reading. Soon after, I began trying to understand the connections between team science, Parsons, Giddens, Nicolescu, Kuhn, and now this new scholar’s work that was invading my already crowded doctoral schedule. I happened to go to my first (the first) SciTS meeting in Chicago, and many of the new members of my community of scholars came to life. Of note was Julie Thompson Klein. However, I remember it was not until the second SciTS conference when I made a presentation under the direction of Stephen Fiore that I worked up the nerve to say hello. It was a cathartic experience. Why? Not because I learned anything more than what I had already extrapolated by reading her work (which was a lot by that point), but because I was able to begin to know the person behind the work. And amazingly, this humble, kind, electric, somewhat sassy, and always on point scholar made no bones about wanting to get to know me, what I was studying, and when the first chance we might do something together might be. This is the Julie Klein I most remember and to this day cherish as a colleague and friend. As I am now in the mid stages of my career, there are many lessons I am still learning from Julie as a collaborator, fellow IN-SciTS Board Member, and most importantly, friend. This project has been a labor of love and dedication to the kindness, encouragement, and trust afforded me by Julie. Gaetano Lotrecchiano may be reached at [glotrecc@gwu.edu](mailto:glotrecc@gwu.edu).

ANDI HESS, MSTech, is Vice-President, International Network for the Science of Team Science. She reports the following. As an undergraduate, I would find myself taking many courses and getting interested in a variety of topics. Each time, I'd get halfway through the material or the course, and I would feel like I couldn't possibly understand that topic without understanding a similar or related topic from a different perspective. Thus, my interests would coalesce around one discipline and then quickly shift to another as I decided I couldn't understand particular time periods without studying history, art, *and* anthropology. Then I would decide that I couldn't understand human movement without anthropology, geography, *and* psychology. Those that teach in interdisciplinary programs will recognize that my experience was not unique among the students that find themselves in our programs. As I struggled to create a triple major, involving subjects none of which I felt allowed for a complete understanding of whatever I was interested in, I happened to stumble upon a relatively new program that Arizona State University was offering in IDS. I remember taking the first course, using Allen Repko's textbook [Repko & Szostak, 2016], and finally feeling like I was in the right place. The theorists I studied (mostly Julie Thompson Klein and Bill Newell) finally provided some evidence that my instincts were well founded and that there were a plethora of connections to be made between the disciplinary perspectives I was learning. Most importantly, the IDS curriculum I studied validated that "every perspective owned a kernel of the truth" and that one was not necessarily more correct than another. It wasn't until years later when I was teaching in the same IDS program that I would come to see myself not as simultaneously an anthropologist *and* a geographer (neither of which quite fit), but instead as an interdisciplinarian. When I first attended an AIS conference, I was thrilled to put names to faces and meet those whom I had studied about, but as it happened Julie could not attend that year. However, I was fortunate enough to meet her at the SciTS conference in 2016. I recall summoning all of my nerve to sit down next to her and introduce myself at a lunch break, simply intending to thank her for the contribution that her ideas had made to my studies and for ensuring that there exists a field to which I can contribute my own work. In the intervening years, a friendship has developed that I value deeply as well as an ongoing dialogue that has continued to inspire my own work in interdisciplinarity and team science. I know there would not be a place in the academy for those of us who work specifically on the theory and practice of connecting areas of knowledge if it weren't for Julie's pioneering contributions to these fields. Personally, Julie's ongoing kindness, support, and encouragement have been invaluable, and for these and many more reasons, I am grateful for the chance to contribute to this project. I sincerely hope that she finds that we have done her work as much justice as is possible in such a short piece. Andi Hess can be reached at andihess@asu.edu.

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