Learning from Klein: Examining Current Interdisciplinary Practices within U.S. Higher Education

by

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Abstract: In this article, I consider Klein's scholarship as a foundation to examine the realities of interdisciplinary practice in higher education institutions, including questions of who engages in interdisciplinary work, how interdisciplinary work is supported, and how interdisciplinary work is organized. In discussing each of these issues, I underscore elements of the higher education context, including funding, enrollment, and staffing. I identify areas that require future research regarding higher education and interdisciplinarity, specifically research engaging questions of inequality in access and outcomes and research examining educational delivery modalities such as hybrid and online learning and the effectiveness of interdisciplinary curricula and pedagogies in these environments.

Keywords: higher education, interdisciplinarity, institutionalization, Julie Thompson Klein, online learning

I first encountered the work of Julie Thompson Klein when I was a doctoral student at the University of Southern California in the mid-2000s. My own field of expertise, higher education studies, is not a stranger to the concept of interdisciplinarity. In the prior decades, the topic had occupied what many higher education scholars might consider to be niche specialty areas, such as undergraduate teaching, student learning, and curriculum development. Evidence was emerging of the "interdisciplinary arms race" in higher education (Rhoten & Pfirman, 2007), a race that continues, with multiple and overlapping concerns about how interdisciplinary teaching, research, and practice might shape the way institutions behave. My engagement with Klein's work expanded my understanding of interdisciplinarity beyond the foci of my academic field; her work was an integral element of my doctoral dissertation, which examined the experiences of doctoral students enrolled

in an interdisciplinary neuroscience program (Holley, 2006; 2009).

When asked to reflect on Klein's scholarship in ways that might extend future research in interdisciplinary studies, I first considered the historical origins of interdisciplinary practices in higher education. While the so-called "arms race" of the 21st century is related to issues of funding, outcomes, and assessment, interdisciplinary activities among colleges and universities are evident throughout their history. A historical analysis reveals endeavors that mirror those of other social institutions – organizing and regulating the knowledge-producing activities of people in ways that promote legitimacy and longevity. Colleges and universities exist for many reasons, but one reason is to educate and graduate students with skills, knowledge, and degrees that translate into individual and social benefits. Yet contemporary rhetoric positions interdisciplinarity and its associated outcomes in near revolutionary terms: as a way to advance human understanding, move disciplines forward by transcending disciplinary knowledge, and better the human condition. Shared among these terms is the belief that interdisciplinarity holds a potential that cannot be reached by traditional, disciplinary ways of knowing. More muted among the same terms are the social, cultural, economic, and political realities in which higher education institutions exist, with the result that interdisciplinarity seems an ideal that all too frequently feels unattainable. Klein (2010) has acknowledged this paradox, noting that "promotional rhetoric and the promises of strategic plans ring hollow when interdisciplinary work is routinely impeded and discounted.…despite all the talk about interdisciplinarity, universities are failing to walk the walk" (p. 4).

Reflecting on Klein's writings as well as the current status of higher education in the United States conveys uncomfortable facts. These facts include declining public support of and trust in higher education; escalating tuition costs and skyrocketing student debt; emerging educational pathways to student learning and skill development, such as vocational, short-term, and credential-based programs; and devaluing of the professoriate in ways that make hiring and retaining future faculty uncertain: all trends that potentially influence the future of interdisciplinary education. Added to these facts are questions and concerns related to nationalism, globalization, and internationalization as well as shifting narratives on definitions of truth and expertise. Colleges and universities are being forced to re-examine their most core task, the production and dissemination of knowledge, in ways that involve consideration of interdisciplinary work. Advocates for interdisciplinarity frequently suggest that educational institutions need to do more to promote the new approaches needed to unravel complex problems and develop sustainable, ethical solutions to those problems; higher education institutions as a whole

face the need to understand and respond to such advocacy.

It is with the belief that higher education institutions serve as a mirror to larger society, reflecting our best and worst tendencies, that I write this article employing Klein's scholarship as a foundation to examine the realities of interdisciplinary practice in higher education institutions, including questions of who engages in interdisciplinary work, how interdisciplinary work is supported, and how interdisciplinary work is organized. In discussing each of these issues, I underscore elements of the higher education context, including funding, enrollment, and staffing. I identify areas that require future research regarding higher education and interdisciplinarity, specifically research engaging questions of inequality in access and outcomes and research examining educational delivery modalities such as hybrid and online learning and the effectiveness of interdisciplinary curricula and pedagogies in these environments.

Who Engages in Interdisciplinary Work?

Understanding the scale and scope of current interdisciplinary efforts in higher education gives important initial insight into what future research related to the topic might entail. Implicit across Klein's scholarship, and indeed that of other researchers who write about and study interdisciplinarity, is the lived experience of people – to understand "interdisciplinarity in higher education" is to understand how students, faculty, and other stakeholders experience interdisciplinary efforts. Students frequently experience these efforts in pursuit of a credential or degree. In 2016, postsecondary institutions in the United States awarded 2.9 million two- and four-year degrees; of these, 30,500 associate degrees and 49,000 bachelor degrees (slightly less than three percent of the total) were labeled as "interdisciplinary studies." These figures do not account for the thousands of degrees in fields such as biomedical sciences or disability studies that likely have curricula that cross disciplinary boundaries (NCES, 2018). Consistent with trends in higher education, the profile of students receiving interdisciplinary studies degrees is highly gendered – females earned 58 percent of the associate's degrees in interdisciplinary studies and 67 percent of the bachelor's degrees in interdisciplinary studies in 2016 (NCES, 2018). Overall, the number of students majoring in interdisciplinary fields has increased in the past decade (NCES, 2018), illustrating a sustained student interest in interdisciplinary learning (Brint, Turk-Bicakci, Proctor, & Murphy, 2009).

Quantifying the number of postsecondary faculty who engage in interdisciplinary work or who reside within interdisciplinary programs is a more

difficult task. While 1.5 million faculty work in postsecondary institutions (NCES, 2018), three-quarters of faculty positions are off the tenure track, typically in contingent, adjunct, postdoctoral, or lecturer roles (Harmon, Hopkins, Kelchen, Persky, & Roy, 2018). Looking across the various types of institutions that employ faculty (two-year, four-year, public, private, not-for-profit, and so on) reveals that only a little over half of all postsecondary institutions in the United States have tenure systems; tenure is no longer the *de facto* reality for most faculty. A widening gap exists between traditional faculty roles and the realities of higher education. At a time when the number of students receiving doctorates and potentially pursuing faculty careers has increased, and student demographics have become more diverse, the desirability of available jobs and the securities offered through the tenure system have weakened.

Examining interdisciplinary studies programs at U.S. institutions reveals how interdisciplinary studies programs are frequently led by contingent, adjunct, or lecturer faculty, or involve only a small number of faculty of whatever sort in relation to student enrollment. As an example, a review of the IPEDS (Integrated Postsecondary Education Data System) database and institutional websites shows six full-time faculty (only one of whom is tenured or tenure-earning) as part of the Interdisciplinary Studies Program at University of Maryland, Baltimore County and 183 students across all degree fields. In the University of Oklahoma Interdisciplinary Studies program, 115 students are enrolled across all degree fields, led by a team of four faculty (IPEDS, 2019). While some interdisciplinary studies programs may have a higher number of faculty per student, or make up deficiencies by drawing on faculty resources from other parts of campus, the student/faculty ratio is at present often too high to be optimal for the student experience. This ratio also suggests a deficiency not just in the number of faculty (including contingent, non-tenure-track, and lecturers) who serve as advisors and mentors, but also in the financial resources and support allocated by the university to the program. The frequently inadequate number of interdisciplinary studies faculty operating without sustained and abundant support is especially significant, given Klein's reminder that the interdisciplinary curriculum is invented by faculty. "Interdisciplinary study is creative and constructed rather than imitative and formulaic," she writes, and this construction requires the attention of empowered faculty (Klein, 1999, p. 17).

On the one hand then, as noted, an increasing number of students are interested in interdisciplinary learning. On the other hand, as also noted, faculty engaged in interdisciplinary work are more likely to be in insecure professional positions and lack access to support such as professional development opportunities when compared to those in more secure positions,

leaving questions about the ability of such faculty to structure and guide student engagement in interdisciplinary work (Augsburg, 2006). In the coming years higher education institutions will likely face continued demands from students to offer interdisciplinary learning opportunities that respond to learning trajectories that do not fit within the traditional four-year undergraduate scheme, that align with real-world challenges, and/or that suit emerging employment prospects. Successfully meeting these demands will require an interdisciplinary faculty community more empowered to create and offer programming than many are now. "Teaching by highly educated individuals engaged in ongoing learning of their own produces a valuable opportunity for students to learn essential knowledge and skills that will prepare them for life and career," conclude Condon, Iverson, Manduca, Rutz, and Willett (2016, p. 1). When faculty lack access to secure employment positions and the power of governance within those positions, not to mention professional development enabling ongoing learning, their capacity to design and deliver interdisciplinary curricula is questionable.

For interdisciplinarians who do assume a faculty position, even a relatively secure tenure-track position, the institutional challenge of working across interdisciplinary boundaries may still be significant. Klein (2013) acknowledges this challenge, noting that often "the rhetoric of transformation and powerful precedents [of such work being well done] are checked by the local political economy of institutionalization" (p. 73). The local political economy may negatively impact the assessment of faculty work and, in turn, the renewal of faculty contracts. Faculty who have secured positions in interdisciplinary programs and who develop and teach interdisciplinary curricula may find that policies and practices guiding their work are unclear. Pfirman and Martin (2010) offer examples of important policies and practices for those engaged in interdisciplinary teaching: "the need for course releases to develop intrapersonal expertise, co-teaching credit for the interpersonal approach, departmental buy-in for the interfield class, and adjunct support for practitioners when external stakeholders are involved" (p. 388). However, such support for interdisciplinary teaching may not be available. And when it comes to interdisciplinary research, Klein and Falk-Krzesinski (2017) suggest that "individuals face a double handicap. Their work is judged typically by discipline-based standards, and their contributions to collaborative research are under-valued if they are not first author on publications or principal investigator on a grant" (p. 1055). Even when institutions do offer policies and practices supportive of faculty working in interdisciplinary areas, these policies and practices usually exist within institutional cultures that have continually demonstrated their resistance to change. As Klein has

often observed throughout her work, this resistance is embedded in the deep roots that the academic disciplines have in the modern higher education system. While these roots ground the system (for example, routing students in a relatively straightforward pathway from entry to graduation through the academic major), they also constrain change. A troubling conclusion is that academia has been and may well continue to be reluctant to pursue the sorts of change necessary to support and further interdisciplinary work, thereby neglecting the increasing student interest in such work and the increasing societal demands for people who can do work of this kind.

How Is Interdisciplinary Work Supported?

Of course, knowledge production activities within the university come at a cost that goes well beyond the cost of a few faculty lines. However, regardless of the metric used, the costs of interdisciplinary programs must be balanced with those of other institutional priorities. As once reliable funding streams for colleges and universities have diminished, including state funding for public institutions and federal aid for students, institutional choices are increasingly made with regard to what value a program or activity provides, and whether this value is consistent with the associated cost. Only uncertain evidence is available as to whether or not interdisciplinary programs are more expensive overall compared to traditional disciplinary programs – hugely variable factors such as institutional context, faculty staffing, and number of students all influence estimates of program costs. A 2013 report from the Delta Cost Project at the American Institutes for Research ranked disciplines by cost per degree; interdisciplinary studies programs were just below the average, but cost more than such majors as mathematics, English, philosophy, and human sciences. Of course, the validity of figures of this sort depends on answers to many questions. What is the nature of faculty appointments in an interdisciplinary program? Does the program have tenure-earning or tenured faculty? Is the interdisciplinary academic program comprised of faculty with dual appointments, and if so, how do the academic departments support these positions? Does tuition generated by the students in the program remain within the program, or is it allocated across academic departments/colleges? Similar questions exist for interdisciplinary research centers, including questions about staffing, structure, and organization. Klein and others have reflected on the tendency to fund interdisciplinary programs through seed grants, venture capital, or related start-up funds with the expectation for future self-support. However, they also have noted it is important for such programs to have "a stream of funding that resists

budget cutting and other pressures" (Klein, 2010, p. 93). Without such a stream flowing when start-up funds give out, future self-support may be very difficult. Over the last two decades, institutions have increasingly expected all academic programs to produce enough revenue to maintain future program efforts. We should expect this trend to continue, and interdisciplinary programs may have a particularly hard time with this expectation.

Another trend that can make the investments to build and sustain interdisciplinary programs seem too costly: the straitened financial realities of higher education in general. Almost every state in the U.S. is spending less on public higher education now compared to 2007 (Mitchell, Leachman, & Masterson, 2016). Over half of the states have moved towards a performance-based funding model, where state-funded academic institutions are "rewarded" based on such criteria as the number of degrees completed annually, the average time to a degree, and/or the employment status and salary of graduates. These criteria fall outside those identified by Klein and colleagues as best criteria for assessment of interdisciplinary programs (Rhoten, Boix Mansilla, Chun, & Klein, 2006), including the ability of students to define an interdisciplinary topic, work with ideas from different disciplines, and be part of an interdisciplinary team. Measuring the productivity of an interdisciplinary degree program by pre-determined criteria designed for traditional academic degree programs has proven challenging (Feller, 2002). Academic institutions understandably shy away from perceived high-risk degree programs that fall outside of traditional boundaries, especially if questions exist related to externally defined performance criteria such as graduates' employability and salary.

Alternatively, interdisciplinary academic programs have been seen as cost-cutting or money-saving endeavors. Consider those institutions that merge several programs underneath a vague interdisciplinary label as a way to cut administrative or staffing expenses. Of course, colleges and universities can use merging and other structural changes to achieve two goals simultaneously, fostering a robust interdisciplinary academic culture while also reducing institutional expense. However, when the primary motivation for such structural changes is upping degree production (increasing the number of graduates under a specific disciplinary or interdisciplinary label as a way to satisfy external criteria) or addressing budget gaps (reducing staff or faculty by consolidating workloads and class responsibilities in response to fiscal shortfalls), the potential for real interdisciplinary learning has usually been usurped for other ends (Augsburg & Henry, 2009). Examples abound of once robust interdisciplinary studies programs that have been diminished or eliminated through administrative decisions related to budget, staffing, or student enrollment. The programs

at Wayne State University and Miami University are two of the most prominent examples (Augsburg & Henry, 2009).

Interdisciplinary research programs (as opposed to interdisciplinary teaching programs) have seen sustained interest from federal, state, industry, and not-for-profit funders. However, the influence of funders thus far has not been benign. Relying on external partners to motivate, fund, or promote interdisciplinary outcomes can reduce the ability of higher education institutions to make decisions based on student and/or academic interests. True, we have had statements from the National Science Foundation, the National Endowment for the Humanities, and other federal agencies in the United States that recognize and prioritize interdisciplinary research funding for at least the past three decades – as, for example, in the National Research Council's *Facilitating Interdisciplinary Research* (2004). However, now multiple decades into this push for interdisciplinary work, we have seen the potential detriment of this push through institutions "simply adopting interdisciplinary labels without adapting their disciplinary structures and artifacts" (Klein, 2010, p. 4). Newly formed interdisciplinary projects still building important bonds of trust and productivity among members can be harmed when academic institutions approach interdisciplinary funding with the same administrative approach as they use for disciplinary funding (e.g., the return of indirect costs to only one academic college or department).

How Is Interdisciplinary Work Organized?

Across much of her scholarship on interdisciplinarity, Klein reflects on the numerous variables that shape how institutions pursue interdisciplinary programming. These variables include the size and mission of the institution, the institutional culture, the financial capacity for this sort of programming, and the depth of the interdisciplinary effort (Klein, 1996, 2010). Colleges and universities may desire to become more responsive to student and faculty (and stakeholder) demands for alternative curricula that promote interdisciplinary work; however, even if they seek out best practices to do so, effective practices vary based on unique institutional characteristics. Klein (2013) writes, "We must test the appropriateness of best practices in the particularities of context" (p. 73). What works on one campus, at one specific point in time, may not work for another at a different time.

The organization of interdisciplinary teaching and interdisciplinary research commonly relies on using familiar building blocks (faculty, credit hours, centers and institutes, etc.) in novel ways. A lingering question is whether novel outcomes such as we expect from interdisciplinary work

can be anticipated from this approach. Writing with William Newell, Klein (1997) has critiqued the adoption of disciplinary practices for interdisciplinary ends, suggesting that managing the complex system necessary for interdisciplinary work "requires recognizing the coexistence of multiple activities and their essential heterogeneity" (p. 8). Moreover, this recognition necessitates changing not just institutional structures, but also institutional culture. The research center, for instance, holds promise as a unit capable of crossing boundaries (Klein, 1996) while responding quickly to external stimuli and maintaining engagement and status within the institution. However, while such centers may be promising vehicles for the promotion of interdisciplinary research, Biancani, Dahlander, McFarland, and Smith (2018) accentuate how such centers may be excessively vulnerable to administrative influences. Where such centers are concerned, "the administration likely has more leeway to change course or to scale the enterprises up or down," the authors conclude, employing "a strategy through which upper administration can exercise a great deal of discretion in steering the university with little opportunity for faculty resistance" (p. 557).

Interdisciplinary degree programs may find their capacity to be responsive to demands for education of this kind hindered by the old thinking that dominates our institutions, too. The "otherness" of these programs can leave them staffed with faculty who lack secure professional status within the institution (a problem noted above). They might also be ill-defined and, at times, unprotected from unfriendly administrative interference. Without adequate resources for the advising they need or other faculty support, students in such programs might be forced to select from a smorgasbord of courses that check boxes towards degree completion rather than encouraged to develop a rigorous interdisciplinary learning experience. This check-the-boxes approach negates the potential of interdisciplinary education to develop relational learning such as "the abilities, commitments, and knowledge [students] need to move among subjects and fields, individuals, communities, cultures, and nations" (Klein, 1999, p. 16). Curricula must be responsive to local contexts, but they must also serve as vehicles for robust learning opportunities. Accordingly, issues such as course sequence and integration across disciplinary bodies of knowledge require empowered faculty action and consistent faculty monitoring if such learning is to take place. And, whatever else happens, the organization of interdisciplinary learning is poised to change rapidly with the growth of online, hybrid, and other emerging delivery models for education.

Speaking of change, contemporary conversation about the organization of higher education reflects on the idea of "the university of the future." What

will the university be like for our next generation, and the ones after that? Among the commonly discussed features are an emphasis on lifelong learning, flexible learning experiences, and responsive financial models. Universities of the future are also presumed likely to advance digital and other alternative learning models and foster knowledge-generating partnerships with non-academic institutions – in sum, meeting students where they are in terms of their learning and desired outcomes, perhaps even anticipating where students will be, and providing training and credentials that are reflective of the needs of a changing economy. As one example, Georgia Institute of Technology (Georgia Tech), with its Commission on Creating the Next in Education (CNE), suggests the need "to imagine a future in which the artificial barriers found throughout higher education disappear" (2018, p. 60). In the Commission's final report, the idea of "interdisciplinarity" is mentioned only briefly, in reference to dissolving disciplinary silos and encouraging collaborative learning across academic departments. Yet the report in its entirety speaks to the sort of educational future where innovation and flexibility (hallmarks of interdisciplinarity) shape the university, as opposed to rigid structures and slow-moving change. Another example of future-think can be found in the so-called New American University at Arizona State University. Lamenting what he called the "fundamental design limitations" of the academic institution (Crow & Dabars, 2015, p. viii), President Michael Crow has spent the past decade re-imagining the possibilities of higher education. The ASU approach differs from Georgia Tech's in that academic programs and colleges are empowered to act based on the interests of students and faculty. By devolving responsibility to the level of the academic unit, ASU encourages students and faculty to seek collaborative learning not just within the institution, but with other entities outside of it.

For research universities of the future that prioritize interdisciplinarity, the organization of this work will no doubt begin with the acknowledgment of expense: Research universities are expensive organizations with a cost per student much higher than that of other institutional types, meaning that dedicated revenue streams and a consistent budget will be key elements of any organizational initiative. While this fact does not necessarily mean that interdisciplinary units must be entirely self-sufficient, the issue of cost will continue to be a paramount reality for institutional administrators and faculty. Furthermore, the master's and bachelor-level institutions (those outside of the Carnegie Classification doctoral-level range) that serve a significant and increasing percentage of students in American higher education have and will continue to have fewer financial resources to devote to innovative or experiential programming. In the future, as now, these institutions are less likely to have a robust endowment as a cushion for financial risk-taking.

Regardless of external pressures for interdisciplinary initiatives across the whole range of postsecondary institutions, then, unless these initiatives are connected to a steady and reliable revenue source, the chances of their widespread adoption across a significant percentage of such institutions are low.

Future Research Related to Interdisciplinarity and Higher Education

I now turn to the question of "What's next?" When we reflect on the scholarship related to interdisciplinarity produced by Klein and her contemporaries, we should do so with a keen eye towards understanding the current and future state of higher education. Answering the question will require consideration of relevance. What is the relevance of interdisciplinarity not just to academic institutions, but also to the multiple stakeholders invested in their work, such as government and industry funders, employers, and policymakers? What is relevant across the range of the more than 4,000 academic institutions in the U.S. that work with a diverse array of students and curricula? What is relevant to bettering the core functions of the academic enterprise (teaching, research, and service) in ways that promote synergy and sustainability?

While the community of scholars who study interdisciplinary education have fashioned a robust research base, led by the work of Klein and others, it is important that we anticipate changes ahead for higher education. This anticipation requires connecting issues of interdisciplinary practice more closely to the higher education system. I believe we have more work to do here, especially considering the rapid pace of change in higher education and the diverse array of institutional types in the U.S. New studies are sorely needed to address interdisciplinary practice.

Drawing on the work of higher education scholar Burton Clark, Klein outlines the delicate balance academic institutions must achieve to negotiate "the gap between older, simple expectations and the complex reality that outruns those expectations" (2010, p. 6). Reflecting on this delicate balance, I examine two potential areas for future research on interdisciplinary studies in higher education: inequality in access and outcomes and delivery modalities of interdisciplinary curricula.

Inequality in Access and Outcomes

Scholars should research which institutions offer interdisciplinary programs, what students have access to these programs, and what outcomes exist for the institutions, faculty, and students affiliated with these programs. Doing so most effectively requires consideration of what we mean by the

term "outcomes." Klein (2005) offers examples of important student learning outcomes, including the ability to ask meaningful questions about complex topics and the ability to understand multiple sources of knowledge relevant to those topics. In an era of heightened assessment and accountability, I suggest furthering our definition of outcomes to more strongly focus on career tracks and professional trajectories experienced by interdisciplinary graduates. For example, at two-year colleges, do graduates with associate's degrees in interdisciplinary studies transfer to four-year institutions at the same rate as graduates from other programs? What factors explain any differences between the groups? Do students who seek short-term certificates or job credentials in interdisciplinary programs secure employment? How well does their training serve them in professional roles? At the level of four-year institutions, comparative analyses of learning experiences and professional experiences of graduates with interdisciplinary degrees compared to their peers will be valuable. A longitudinal analysis of non-traditional graduates who arrive at the institution with credits already earned and assemble those credits towards an interdisciplinary degree would give insight into important issues such as prior learning assessment and college credit earned through workforce training, military training, or industry certification.

Demonstrating the outcomes of interdisciplinary degree attainment, in terms of individual student development as well as career advancement, is important to understanding the value-added nature of interdisciplinary education. For example, educational researchers have documented the influence of the college major on professional trajectories and earnings after graduation (Altonji, Arcidiacono, & Maurel, 2016). Unemployment rates for students aged 25-29 years old who completed an interdisciplinary studies bachelor's degree were four percent in 2016, roughly the same as those of graduates in English language, criminal justice, and mathematics (NCES, 2018). Examining how employment rates for graduates with interdisciplinary studies degrees change over time and what professions these graduates pursue will remain important. Amid institutional conversations regarding performance-based funding, information on employment rates and professional trajectories for interdisciplinary studies graduates can help inform administrative decision-making.

Delivery Modalities and Interdisciplinary Curricula

The realities of higher education in the years ahead will include a continued increase in online learning, a trend that runs counter to the downward trend of student enrollment overall. In the future as now these enrollments

will include fully online courses, in which all of the content is delivered virtually and students do not meet in a face-to-face environment, and blended or hybrid courses, in which a portion of the coursework is delivered virtually and a number of face-to-face meetings are required. Learning formats that include gaming or interactive virtual reality as well as MOOCs (massive open online courses) show the continued growth in educational environments and pedagogies beyond those of the traditional classroom. In 2014, 2.8 million students in higher education took coursework solely online, and that represents approximately one in seven learners (Allen & Seaman, 2016); again, this number is expected to increase for future generations of learners.

Despite its increasing popularity among students, online education still faces numerous institutional barriers. Faculty can be reluctant to develop online courses and engage in an online learning environment; only about one-third of chief academic officers at four-year institutions in the United States say that their faculty are supportive of online education (Allen & Seaman, 2016). Further, not all academic institutions have support systems or processes in place that enable faculty to participate in online course development and delivery. A close examination of online education reveals that the divide between institutions along such lines as prestige, resources, access to technology, and ability to move innovations forward quickly results in uneven program development and student outcomes.

The nuances of online education and related rapid change of technology bring additional complexities to questions of interdisciplinary programming. Patrick, Wicks, and Powell (2014) observe, "There is great diversity in the effectiveness of courses and content….increasing access alone [to online programs] will not lead to better outcomes for students" (p. 88). We lack an effective blueprint to support the features of impactful interdisciplinary learning such as learning communities, faculty networks, fluid disciplinary curricula, and subdisciplinary boundary crossing (Klein, 2010) when we project those features across a virtual environment and not solely across the physical map of a campus. However, interesting examples of possible templates for interdisciplinary engagement in an online environment do exist. One example involves new interdisciplinary fields that span multiple academic disciplines and encompass the online realm, such as the games studies and e-sports program under development at The Ohio State University, which will span five OSU colleges and eventually include undergraduate and graduate degrees, online certificates, and a range of virtual reality and computer gaming experiences. Another involves the growth of fully online graduate degrees in a variety of interdisciplinary academic fields, especially those that integrate theory and practice, such as social work and computer science.

Conclusion

In this article, I have built from the foundation provided by Klein's scholarship as a way to examine the contemporary reality of interdisciplinarity in higher education, particularly who engages in interdisciplinary work, how interdisciplinary work is supported, and how interdisciplinary work is organized. Interdisciplinarity in higher education remains an endeavor laden with problems, as Klein and others have repeatedly reminded us. Confronting these problems in the future is likely to have one of two possible outcomes. One would be that discussed by Bammer (2017): changing interdisciplinarity, or more specifically, "disciplining" interdisciplinarity. Compartmentalizing interdisciplinary work within a disciplinary structure (and presumably, a related departmental structure) would allow for collaboration, academic recognition, professional advancement, and professional networks such as those that define established academic fields of study. But what might be lost in this approach, in which we would turn to the same model that has categorized knowledge for over a century as a way to produce new forms of knowledge? Instead, we can continue to strive for institutional change moving forward. We can extend and expand upon the work of Klein, to research and document best practices across institutional contexts. We can advocate for changes that allow scholars engaged in interdisciplinary work to secure, retain, and advance in faculty positions defined differently than those in the traditional model. We can articulate and harness the developments ahead for higher education institutions in ways that will allow interdisciplinarity to thrive.

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