Perspectives on Interdisciplinarity in Academia

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Interdisciplinarity is different things to different people. To some it is a means to an end, to others it is an end in itself. As means to an end it is sometimes understood as means toward greater insight, or toward more successful problem solving, or as means toward achieving or maintaining the good life. Interdisciplinarity is also thought of as a philosophy of knowledge.

All things considered interdisciplinarity may be understood as a resurgence of the desire to see the 'bigger picture'. It is, then, a response to a very old question.

On a more operational level interdisciplinarity is, of course, also a reaction to the perceived shortcomings of disciplinary knowledge. With all due respect and gratitude toward what it has given us, disciplinary knowledge can be viewed as a kind of abdication. Cloistering in their proverbial ivory towers around discipline-specific standards of excellence and relevance academics have cultivated an avoidance of responsibility toward society. How their discipline's knowledge can be beneficial toward building a good society – that is someone else's business. Interdisciplinarity is, in part, an orientation toward reflecting and acting on such matters.

It is not surprising that disciplinary academic traditions have raised a bias toward the 'deep' rather than the 'broad'. Interdisciplinarity as a philosophy of knowledge would strive to strike a balance, respecting the ecology of knowledge reminiscent of what Heidegger (1992, 2002) referred to as *Denken,* an attitude and practice that pays tribute to depth, breadth, timeliness and relevance to society.

Much has been said about the benefits and synergies coming from interdisciplinary collaboration or interdisciplinary activity of an individual, ranging from the observation that real world problems do not arrive neatly packaged by disciplines to the realization that the two camps are naturally complementary. So then, why, to this date, is it so difficult to establish and sustain interdisciplinary academic degree granting programs?

Disciplined-Based Attempts to understand the World

In so-called Western societies the tradition has established itself to attempt to understand the world along distinct channels tied to disciplines and their methodologies. In the background hovers the assumption or hope that once we understand all the separate parts we will be able to synthesize them and eventually understand the whole. Higher education institutions (and actually it already starts in elementary schools and high schools) convey by

curriculum and by role models that knowledge is produced and consumed in parallel in a number of disciplines. Professional as well as social networks have developed along disciplinary lines. It is the people you professionally associate with every day that, typically, also turn out to be the network you turn to socially. Being integrated into a discipline is perceived to be good for one's career, and, in turn helped the advancement of the discipline.

It has, however, not gone unnoticed that there is another side to the coin. Disciplines put severe constraints on the questions one dares to ask. The conceptual and experiential co-ordinate system of a particular discipline frames the range of 'admissible' research questions as well as the range of 'legitimate' methods of investigation. And not only that - even the range of 'legitimate' answers is pre-ordained (Kuhn 1977; Becher & Trowler 2001; Biglan 1973a, 1973b). Breaking out of these constraints is among the motivations for interdisciplinarity.

Shared perspectives across disciplines will encourage interdisciplinary work. In this context Crane (2001) points out that 'acceptability of a new idea' depends on the cognitive distance, or the amount of cognitive reshuffling necessary to integrate the new idea into one's existing cognitive co-ordinate system. In the same vein Gold and Gold (1983) point to how similarities in cognitive structures can promote collaboration between people anchored in different disciplines.

As is the case with collaboration in general, communication difficulties can be a formidable barrier to successful interdisciplinary work. After all, the disciplinary lingo is one of the glues that holds disciplines together. Discipline-specific jargon provides a convenient shorthand, as pointed out by, for example, Becher and Trowler (2001). Some disciplines, such as mathematics, possess a collection of special symbols, that are not found in common language. There also exist significant differences between disciplines in how the work of peers is judged, and how arguments are formulated. Bauer (1990), for example, shows how communication problems among interdisciplinary team members retards progress on research projects.

Interdisciplinarity Defined

The literature offers many definitions of interdisciplinarity. Some of them focus on the integration of distinct disciplines via collaboration, others imply a rejection of disciplinary knowledge, some have a practical bent, while yet another group stresses epistemological considerations. Here we adhere to the relatively broad and 'tolerant' definition given by the Centre for Educational Research and Innovation CERI (OECD 1972). The focus is on interdisciplinary interactions:

> "Interdisciplinarity – An adjective describing the interaction among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data, and organization of research and education in a

fairly large field. An interdisciplinary group consists of persons trained in different fields of knowledge (disciplines) with different concepts, methods, and data and terms organized into a common effort on a common problem with continuous intercommunication among the participants from the different disciplines." (OECD 1972, pp.25-26)

It should be noted that while the above definition relies on a disciplinary anchoring of interdisciplinarity, it, nevertheless, accommodates postmodern interpretations. This is because the postmodern critique of disciplinary inquiry does, in the act of critiquing, engage the disciplines. The definition also allows for a large spectrum of 'intensities' of interdisciplinarity by accommodating everything from informal conversation to structured research and teaching.

Intrinsic Drivers of Interdisciplinarity

With the expansion of disciplines came increasing complexity. This, in turn, led to subdivisions of disciplines into specializations, distinguished by both the types of research questions and the types of methodologies applied. This fracturing into separate specializations propelled a certain readiness to question traditional disciplinary frameworks, methodologies and opinions on what constitutes good quality in research. And this in turn propelled the further growth of the disciplines. This led to a situation where often members of different specializations within a discipline did not have any more in common than members of different disciplines. In this way crossing borders between disciplines did not feel much different from crossing borders between specializations within a discipline. Take, for example the discipline economics. A member of the specialization history of economic thought may actually feel less 'cultural distance' to a member of the discipline history, than, say to a fellow economist with a specialization in econometrics. Thus, one driver of interdisciplinarity comes from the members of the disciplines themselves, who recognize commonalities across disciplines as well as estrangement from other specializations within the same discipline. At the risk of sounding overly dramatic one could say that the evolution of the disciplines carried within itself the seeds of disciplinary self-doubt.

Extrinsic Drivers Toward Interdisciplinarity

Another driver of interdisciplinarity comes from pressing societal challenges that seem to defy 'simple' discipline-based solutions. Here the evolution of interdisciplinary inquiry to date is of interest. Initially interdisciplinary inquiry was of the 'instrumental' kind, i.e. solution to a problem was invited, and a collection of investigators from a collection of disciplines applied a collection of 'imported' methods to arrive at a collection of disciplinary perspectives on the issue at hand. While this approach continues to be deployed, other scholars, with a more holistic concept of a 'solution' to a problem where not shy to disrupt traditional discipline-based discourse and to question conventional definitions of knowledge.

In the USA, for example, the Social Science Research Council was founded in the 1920s to drive forward integration among social science disciplines. During the 1930s and 1940s concerns about societal events and developments, such as war, migration, crime, and social welfare programs cried out for attention from more than one discipline. (Klein 1990). This found expression, for example, in the emergence of area studies at US universities during the 1930s, which continued to flourish until the 1970s.

A new extrinsic driver of interdisciplinarity came in the form of World War II, with its problem-driven demands from military and political interests. This issue-based interdisciplinary research orientation persisted into the 1970s and opened new funding channels in the form of, for example in the USA, the National Science Foundation and the National Institutes of Health. During the 1970s interdisciplinary research shifted focus to areas such as environmental protection, product safety and technology assessment. (Lattuca 2001)

Circling the Wagons

The emergence of the interdisciplinary 'insurgents' with a strategy of undermining and deconstructing discipline-based concepts of knowledge – real or imagined – brought forth defensive/aggressive behavior on the part of the disciplines. While initially the main criticism of interdisciplinary scholarship was that it was devoid of rigorous analysis and beset with dilettantism (and this kind of criticism is certainly continuing to this date), now another dimension of criticism became fashionable: Interdisciplinarity was to be opposed on grounds of infecting peoples' minds with pernicious ideas based on untenable assumptions of post-modern thought and aimed at undermining and discrediting the good work of discipline-based scholars.

Alas – interdisciplinary scholarship had become something to be reckoned with.

Interdisciplinarity as a critique of the disciplinary concept of knowledge found its expression in, for example, parts of womens studies, ethnic studies, and literary studies. Promotion of interdisciplinarity, however, also became associated with movements along a broader front: a re-definition of knowledge and knowledge construction/acquisition. While some scholars aimed at integrated interdisciplinary perspectives, for others, particularly in the feminist, poststructuralist and postmodernist camp, re-defining knowledge took the form of derailing disciplinary perspectives. It is this latter movement that prompted the vigorous and sometimes shrill attacks against interdisciplinary efforts by the traditional disciplines.

As a side note it should be remembered that what we now consider to be the 'normal' spectrum of academic disciplines had its own 'growing pains'. Up to the late 1800s the 'medieval structures' were in place. The study of arithmetic, geometry, astronomy, and music, as well as logic, grammar and rhetoric prevailed, preparing students to move on to

natural philosophy (late called physics), moral philosophy (later called ethics) and mental philosophy (later called metaphysics). This structure came under pressure during the early 1800s. Students began to voice their demands to have advances from science and industry represented in the curriculum. Demands for engineering, the natural sciences, and mathematics, but also literature, history and philosophy became louder. It was a long road from initial student demands to their implementation. The medieval model prevailed until the late 1890s. Thereafter the now familiar academic disciplines dominated the scene, and increasing numbers of sub-specialties developed, as already mentioned above. (Lattuca 2001)

Demographics and Critical Mass

As there still are few interdisciplinary degree granting academic programs relative to programs in traditional disciplines it turns out that most team members of interdisciplinary ventures have been trained in traditional disciplines. It is in this context that they must learn to value perspectives and methods that are different from their own training and discipline-specific culture. That is, most participants in interdisciplinary activities remain deeply anchored in their home discipline. This makes them presumably relatively low-motivated promoters of the concept and practice of interdisciplinarity. In this view interdisciplinary programs have difficulties establishing themselves because of a lack of true champions.

It also has not gone unnoticed that the number of interdisciplinary academic journals is still rather modest in comparison with disciplinary ones. This has spun a narrative that it is difficult to get interdisciplinary research published.

Cultures and Careers

Collaborative ventures across discipline boundaries in social sciences, for example, are familiar with the disparaging word 'soft', as in 'lacking in rigor'.[1] Anybody having worked with economists, for example, will have run across this verbiage. The ensuing attitudes can render career paths along interdisciplinary lines relatively unattractive and risky.

Social conventions are ever present when it comes to evaluating 'appropriate' topics for research, the type and structure of research questions and their answers. These discipline-specific judgments, not surprisingly, lead to different understandings of what constitutes good scholarship.

Viewing disciplines as cultures points to the community, the faculty life, as an important source of behavioral differences between disciplines. Schein (1986) points out that the effectiveness of a group is influenced by how clearly the boundaries of the group are defined. Clearly understood boundaries tend to instill a stronger sense of group identity to a member. Clark (1983) further highlights that faculty members in very prestigious universities

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[1] Likewise, of course, academics anchored in 'soft ' disciplines may think of rigorous quantitative approaches as 'bit-headed' lack of capacity for the bigger picture.

tend to identify themselves more strongly with the profession than with the institution, due to their frequent interaction with national and international networks of colleges of the same discipline. In this context, already as a graduate student one seeks acceptance into the community of scholars of a particular discipline – and with it comes a certain sense of loyalty to the tribe.

This, in part, explains one of the perceived impediments to interdisciplinarity at universities: that faculty members experience a loss of disciplinary identity when they leave their 'home' communities to join a interdisciplinary program. They may also be hesitant to abandon a position of influence and reputation that they may have achieved after many years of hard work in their own discipline, as Becher and Trowler (2001) point out.

With reference to the above mentioned 'demographic' issue concerns arise regarding evaluation of interdisciplinary grant applications - when it must be assumed that the referees are drawn from traditional disciplines – and failure to obtain funding may originate from non-understanding[2].

Among younger academics, in particular, the specter of unsympathetic promotion- and tenure review committees, with imputed hang-ups on key words such as 'soft' and 'lacking in rigor', can be a formidable deterrent, based on the perception that interdisciplinarity is not good for your career.

And, as Birnbaum (1981) demonstrates, among interdisciplinary scholars we find a high incidence of people, who are not concerned about tenure – either because they already have it, or because they are not in tenure-track positions. Furthermore, non-tenured academics in tenure-track positions expressed some trepidation about the effect of their interdisciplinary activity on their career prospects.

During periods of budgetary contraction it is often the interdisciplinary centres that bear the brunt of financing cuts. Partly this is due to traditions in budgetary channels at universities (i.e. through the disciplines), partly this comes from the perception that interdisciplinary units are 'outreach activity' and therefore peripheral, in contrast to the disciplines that are seen as forming the core of the institution. This brings us to political economy considerations.

Political Economy

Regarding budgetary negotiations essentially as a zero-sum game, the establishment of new interdisciplinary programs or centres is frequently viewed with a jaundiced eye by the

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[2] Here it should be noted that the recognition of these difficulties has led to reserving certain funding for interdisciplinary work. In this context the European Commission, for example, stands out in providing research funding for interdisciplinary work.

established disciplines. It is a resource war and new competition for funds is not exactly welcome. In the same vein, interdisciplinary units may, in times of budgetary distress, be the first ones to be closed down.[3]

Interdisciplinary programs often have an uphill struggle simply because departmental structures of universities and colleges are oriented on disciplines for both teaching and research. Likewise the institutional reward and incentive mechanisms are arranged around disciplines. However, it is not clear whether individual behavior is dominated by institutional rewards or rather by individual preferences and standars. Nevertheless, departmental structure of higher education institutions, typically oriented along disciplinary lines, has been consistently mentioned as a problem for interdisciplinary research. (Lattuca 2001)

Interdisciplinary course programs also are negatively impacted when there is pressure on resources. Often interdisciplinary education programs operate with 'loaned faculty' from various disciplinary departments. These source departments will withhold faculty whenever their own departmental teaching needs are high. This, in principle, can be easily remedied by affiliating dedicated faculty directly with the interdisciplinary unit. In practice, however, we do not see this very often.

Fourcault (1979) places the concept of discipline in relation to the concept of power, endowing 'discipline' with the attributes of behavior regulation and norm that obey the directives of a distinct system of power. This power extends to recruiting and dismissing, rewarding or punishing interdisciplinary scholarship, promoting and demoting interdisciplinary scholars. According to, for example, Salter and Hearn (1996) "Academic disciplines are evidence of the political deployment of knowledge products" (p.17).

Autonomy

One of the issues in the discussion of interdisciplinarity centers around autonomy – or rather the lack thereof. When it comes to staffing interdisciplinary units joint appointments tend to be the norm, such that a staff member is associated with a interdisciplinary unit as well as with a disciplinary unit. Traditional thinking then follows the line that the specialized discipline provides the 'home unit' and the interdisciplinary one provides an 'outreach unit'. With regard to the above-mentioned tenure concerns, if, as is often the case, it is the 'home unit' that is responsible for the tenure decision, jointly appointed staff, being risk averse, will tend to gravitate around the tenure granting discipline. This is likely to result in reduced commitment to interdisciplinary work.

One way around this has been for interdisciplinary academic areas to actually become disciplinary. For example the creation of disciplines such as biochemistry, biomedical engineering, and neuroscience has followed this path. Practical benefits have come in the

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[3] For example, it has been observed in the US that well established interdisciplinary bachelor studies have been closed down, although student enrollment was substantial.

form of dedicated research funding, independent tenure decisions, as well as general visibility. Whether this development – interdisciplinary disguised as disciplinarity - has helped or hindered the progress of interdisciplinarity in general is a matter for debate.

Criticism of Interdisciplinarity

It is widely agreed, by supporters and detractors alike, that the most serious critique regarding interdisciplinary programs is their lack of synthesis. Programs offer a collection of disciplinary perspectives providing a multitude of views without guidance toward forming a bigger picture. This fragmented view can be gleaned from listening to conversations among students in interdisciplinary (multidisciplinary) master programs. Assessing their prospects for good grades they talk about 'easy courses' – those from within the discipline in which they received their bachelor degree. 'Hard courses' then are those from 'foreign' disciplines. It is not uncommon to hear students say that of course they expect to get a top grade (A) in the 'easy courses'. But that for courses from 'foreign territories' a middle-of-the-road grade would, naturally, be acceptable.

Critics of interdisciplinary programs, particularly undergraduate programs, sometimes voice the opinion that it is unreasonable to expect students to have the necessary intellectual maturity to understand the common themes that disciplines communicate in their different forms. Defenders, on the other hand, are quick to point out that students typically tend to have a greater capacity for interdisciplinary concepts than their instructors because they have been less exposed to the 'brainwashing' of disciplinary tunnel vision. Defenders invite to review the type of questions asked, on average, by grade school students, high-school students, bachelor students, master students and PhD students, and to note the monotonically decreasing interdisciplinary of the questions asked that accompanies the increasing maturity of the young people. In addition defenders stress the importance of developing interdisciplinarity as an attitude – a habit of mind – and that this is best begun early on.

Complementarities

Interdisciplinarity is, by some, viewed as an antidote to the damage done by excessive specialization. Others retort that then the term 'anti-disciplinarity' may be more fitting, and are quick to point out that interdisciplinarity is deeply indebted to those who immerse themselves in specialized fields of study. In other words, without specialist, interdisciplinary environments would be poorer. Moreover, when novel solutions to problems emerge from interdisciplinary collaboration, valuable information is channeled back to the individual constituent disciplines. These 'upstream' and 'downstream' flows clearly point to the relations being complementary rather than adversary.

On the operational end legitimizing interdisciplinarity calls for demonstrating that the intellectual and societal benefits coming from interdisciplinary scholarship substantially outweigh the difficulties encountered.

From a historical-evolutionary perspective we should not forget that institutionalized interdisciplinarity is still in its infancy. It took a century for the now firmly established disciplines to be fully accepted and implemented. The disciplinary movement was a response to the perceived shortcomings of the holistic view of the causal ordering of the world offered by metaphysics: That everything was the will of the gods. The disciplinary movement was a response to new demands of the world. If we now feel overwhelmed and frustrated by the flood of specialized and disconnected information hitting us every day, well, the interdisciplinary movement is a response to that. After a period of necessary and desirable reducing, separating, analyzing and specializing the demands of the world call for synthesizing and transforming information into knowledge – not to replace the disciplines but to complement them.

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