'Science' and 'Culture' in University Settings. Areas of Overlap? Areas of Tension? Or, Areas of Mutual Complementarity?

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On the one hand, 'interdisciplinarity' in all its formats, ranging from multi- to transdisciplinarity, has become the focal point of research agendas and a high priority of many funding bodies, while, on the other hand, universities by and large still remain discipline-oriented. This 'tension' is especially manifest between 'science' and 'culture' in the sense of bridging gaps between disciplines and research domains. The main roles of the Humanities and Social Sciences can be said to be the development of critical and independent thought, the identification and dissemination of important social and cultural values, as well as challenging widely held assumptions and beliefs. This article focuses on new 'interpretations' of knowledge seen as the fundamental link, which can, within university programmes, raise the awareness of the importance of the Humanities and Social Sciences on one hand, but, more importantly, also put into a much wider context the different 'knowledges' necessary for the contemporary understanding of how 'science' should be geared towards the individual, society, as well as the global community at large.*

Introduction

Almost 70 years have passed since C.P. Snow in his famous Rede lecture of 1959 introduced the notion of the 'two cultures', stressing the duality of the natural sciences and the humanities as a seemingly self-evident reality underpinning the production of knowledge as well as dividing academic environments.[1]

Snow's main argument was that the university was a divided community with distinct cultures and with distinct modes of expression. His views have become

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famous both through extensive quotations but even more so through many criticisms, probably the most famous of which is that of F.R. Leavis.[2] Despite decades of controversy, the notion of the 'two cultures' or 'the two cultures controversy' is still almost in a metaphorical sense present in how 'knowledge' is viewed and conceptualized both in research as well as university settings. This makes the topic of the conference 'On the Conflicts and Dialogues between Science and the Humanities', held at the Shanghai Jiao Tong University in May 2016, both timely and relevant because it brings together the basic concept of science and the basic concept of the Humanities. The concept of 'culture' is in many ways an even more difficult notion or phenomenon to understand and define. However, culture is fundamentally linked to the Humanities and the realization of its importance can be said to be growing. In my view, the Humanities are gaining momentum because they can be seen as the building block for bridging and combining different 'cultures of knowledge'. This seems to be acknowledged more and more in some areas of research and at some universities. It should be noted that new 'networks of knowledge' in the sense of bringing together the two cultures are by default embedded in 'cultures of knowledge' in two basic senses: embedded in different cultural, historical, etc., contexts; embedded in different scholarly traditions and cultures of disciplines as well as their historical development. The above statements are not always easily explained or understood, especially with reference to the context of culture, which has for centuries avoided clear definitions and, in a nutshell, it can be said that culture is notoriously difficult to define. So much has been written about culture, it truly has a long tradition, especially within anthropology, of different authors and different researchers trying to define the core concepts behind the notion of 'culture'. Going into the many complexities of the definitions we find on 'culture' is most certainly beyond the scope of this article. However, a very useful overview can be found in 'What is culture? A compilation of quotations' by Helen Spencer-Oatey,[3] from which we quote the following two definitions: '"Culture ... is that complex whole which includes *knowledge*, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society." Tyler (British anthropologist) 1870: 1; cited by Avruch 1998: 6' (emphasis added), and '"Culture consists of the *derivatives of experience*, more or less organized, *learned or created* by the individuals of a population, including those images or encodements and their interpretations (meanings) *transmitted from past generations, from contemporaries*, or formed by individuals themselves." T. Schwartz 1992; cited by Avruch 1998: 1' (Ref. 3, p. 2, emphasis added).[3,4] As can be seen, two basic notions appear in definitions of 'culture' are 'knowledge' and 'experience'. 'Knowledge' specifically has been a focal point of interest in many contemporary approaches to 'multi/transdisciplinarity' research as well as foundational in developing and building university programmes.

The Challenge of the 'Two Cultures' in Research

The tensions inherent in the notion of the 'two cultures controversy' have, over time, gained significance in the sense of providing new challenges both for research and higher education. The question is how to deal with this 'duality', especially in the

context of the strong push towards 'interdisciplinarity' in all the forms it appears in, from 'multi-' to 'transdisciplinarity'. 'Interdisciplinarity' ranks very high, especially in research topics stemming from the so-called Grand Challenges, and has become a high priority on the agendas of many funding bodies, whether national or those at European level.

The Grand Challenges (the classic examples such as climate change, water resources, sustainable energy, more recently immigration, etc.) by default do not easily fit within traditional disciplinary, or even to a lesser extent, subdisciplinary boundaries. Their overreaching complexity poses challenges for both research and university education. The complexity of crossing disciplinary boundaries and integrating different 'cultures of knowledge' as well as disciplinary traditions in some cases has resulted in 'new cultures of knowledge' resulting from close collaboration between researchers belonging to different disciplines and different domains of research.

Apart from positive examples of successful 'interdisciplinary' endeavours in the narrower sense of research results, a great deal of thought and reconceptualization has been devoted to crucial questions regarding the true nature of 'knowledge' as well as its ultimate purpose. Questions are asked: for whom do we produce 'knowledge'? How do society and ultimately the individual profit from it?

In the growing body of literature on these crucial issues, it is worth noting, at least in broad strokes, some of the most prominent names and thinkers who have put forward important concepts and have paved the way for redefining and widening the concept of 'inter/multi/transdisciplinarity'.

In this context, the seminal work of Jürgen Mittelstraß has to be mentioned, that is, his advocacy for transforming 'empirical knowledge' into 'orientational knowledge' which is by definition culturally defined and socially implemented.[5] In a later paper, Mittelstraß further develops the notions of 'science' and 'knowledge' by drawing upon a broad range of concepts, from Aristotle's visions to contemporary concepts such as the 'commercialization of knowledge' and what Mittelstraß calls 'a third type – the product- or invention-oriented research.'[6] The changes that he identifies, especially those referring to knowledge, are expressed at the end of his paper in the following quotation:

> Knowledge in scientific form has increased dramatically, values have changed, and the paths of science and values are no longer the same as a matter of course. But they will have to come together again so that a rational society, which builds on the performance of science, has a humane future. (Ref. 6, p. 33)

What should also be mentioned is the work of, amongst others, Michael Gibbons and Helga Nowotny on the so-called Mode 2 knowledge production, that is, knowledge production seen as a process for which people come together in temporary networks on specific problems in the real world.[7,8] However, the following should also be stressed

> Mode 2 does more than assemble a diverse range of specialists to work in teams on problems in a complex applications oriented environment. To qualify as a specific

form of knowledge production it is essential that enquiry be guided by specifiable consensus as to appropriate cognitive and social practice.[9]

In this brief overview, one more name has to be mentioned and that is of Robert Frodeman.[10] His views are clearly mirrored in the 'Introduction' to the *Oxford Handbook of Interdisciplinarity*:

> [...] *the solution* to our social, political, intellectual and economic problems *does not lie in the accumulation of more and more knowledge*. What is needed today is a better understanding of the relations between fields of knowledge, a better grasp of the ways knowledge produced in the academy moves into society, and a better sense of the dangers as well as the opportunities of continual knowledge production. (Ref. 11, emphasis added)

Although the overreaching philosophical approaches to inter/multi/transdisciplinarity do on one hand point to fundamental issues and underline crucial aspects of how to tackle research topics that go well beyond disciplinary boundaries, the reality of doing such projects brings to the forefront the difficulties and problems researchers encounter. An example of this, an example that shows that the various challenges inherent in this kind of research can be successfully dealt with, is found in Australia, dealing with urban water research. This is a concrete confirmation of Krohn's claim that 'The most complex problems are so-called real-world problems.'[12]

The paper entitled 'How to catalyse collaboration' is a well-articulated overview of a complex project that started in the early 2000s with two groups working on urban water research, one at the Faculty of Engineering focused on sustainable storm water technologies and the other at the Faculty of Arts, both at Monash University in Melbourne, Australia.[13] From these early beginnings, this truly impressive enterprise has grown, incorporating at present institutions both at the national and international levels. Over the years, and especially from 2012, when exceptionally high funding was awarded, it has grown into a Cooperative Research Centre for Water Sensitive Cities and comprises 85 institutions (of which 13 are research institutions). What is most impressive is that it numbers around 230 researchers and PhD students covering '[...] more than 20 disciplines and subdisciplines across the social and biophysical sciences and humanities' (Ref. 13, p. 316). This almost overwhelming enterprise as it stands today did not only produce the storm water biofiltration technology that has been adapted across Australia and in Singapore, China, and Israel, but has through persistently doing interdisciplinary research, also come up with important 'lessons learnt' that mirror the numerous ups and downs the project had to go through.

Out of the five points that the authors stress as being fundamental in overcoming interdisciplinary complexity, a couple of them are of special importance. One of them is the factor of *time*. Namely, funders usually do not calculate the fact that interdisciplinary research takes more time, if nothing else because of the initial period needed to establish avenues of communication across the disciplines. Time is also of the essence in the necessary combining of different 'cultures of knowledge', and this combining should ideally result in 'relational knowledge', which may imply reconceptualization of the so-called hard facts.

New ways of interpreting and integrating facts should result in 'networks of knowledge' which in themselves can be seen as *innovation*, in many respects the Holy Grail of funders, especially at European level as in, for instance, the Societal Challenges within Horizon 2020. However, with limited, usually strictly defined, time schedules for projects, much can be lost in the push to achieve goals by set deadlines.

The second point worth mentioning is the need of developing *mutual understanding* and *respect* between especially the so-called hard sciences, and the Social Sciences and the Humanities. Brown et al.[13] specifically mentions the tensions caused by biophysical researchers accusing social sciences of poor rigour and spending too much time on conceptualizing problems, while social sciences researchers were frustrated by the fact that biophysical researchers were too focused on concrete solutions and often overlooked the wider social implications of their proposed outputs. However, by forging a shared mission and nurturing constructive dialogue these basic stumbling blocks were overcome.

Another example that strongly emphasizes not only the need but also the high benefits of 'interdisciplinary' research comes initially from developments in artificial intelligence embodied in robotic technologies, which aim at developing new ways of helping children with autism interact with the world around them.[14]

Therapists working with autistic children often use puppets in order to engage them in interactive play, since children with autistic spectrum disorders prefer to interact with non-human agents. As of relatively recently, small cute robots are being used in both the diagnosis and treatment of various autistic disorders, the assumption being that robots could be more effective in the sense that they would not only serve as go-betweens, but that they could learn how to respond to a child's emotional state. This is basically one of the main aims of the EU funded DREAM project, although there are other projects working on humanoid robotics with the aim of assisting the rehabilitation of people suffering from schizophrenia or social phobia.[15]

At the University of Zagreb, Croatia, a team of early-career researchers has gathered in a successful Laboratory for robotics and intelligent systems management (LARICS) and among other projects is working on adapting humanoid robots for the diagnosis and eventual treatment of children with autism spectrum disorders.[16] This endeavour has drawn together researchers from the Faculty of Electrical Engineering and Computing (which LARICS is a part of), Faculty of Education and Rehabilitation Sciences and also is a collaboration with the Croatian Institute for Brain Research (a part of the Faculty of Medicine at the University of Zagreb).

Although interdisciplinary research groups such as those mentioned above are most certainly a way forward in providing higher level diagnostic tools, and in time therapeutic tools for mental disorders, a higher more complex level of interdisciplinarity is needed. Thus, for instance, researchers who are part of the EU-funded DREAM project[15] are very much aware of ethical and legal issues that still have to be resolved. Because of safety considerations and questions as to who should take responsibility for the robot's behaviour, an integrated research program is being developed that apart from research and innovation also encompasses ethical issues.

The example from the University of Zagreb points to other challenges apart from the ethical and legal ones. The robots in question were bought from a French company specializing in humanoid robotics (Aldebaran Robotics), and these friendly looking robots are named after the characters from the well-known TV series *'Allo 'Allo!*: Herr Flick, Helga, René, Monsieur Leclerc, etc. Now these robots are being 'adapted' to the Croatian cultural and linguistic (in the widest sense of the word) environment. Thus, it is possible to expect that the research team at LARICS be expanded with researchers from disciplines from the humanities in order to achieve the high set aims, but also to reach these aims in the safest and most efficient ways possible.

Highly developed, or developing, 'interdisciplinary' research projects that truly bring together a wide range of disciplinary expertise can exert very beneficial effects on all players involved. For instance, the humanities are traditionally known to play an important role through the various ways humanities disciplines identify and disseminate important social and cultural values – relevant to the aforementioned examples. They also often challenge widely held assumptions and beliefs, as well as play an important role in the development of critical and independent thought.

However, interactions with other domains of research also bring about reconceptualizations within the humanities disciplines themselves. To take ethics as an example, the context of the Grand Challenges sets into motion the rethinking of the 'human element' in new contexts, from the individual to concrete, immediate social contexts, and even further to possible global implications. This implies deep conceptual changes at all levels: both ethical and bioethical norms as the grounding for responsible behaviour from the level of the individual to the level of global considerations.

The Challenge of the 'Two Cultures' in University Programmes

The unbelievably high level of knowledge production today results in an ever-increasing overburdening of knowledge systems at institutional levels. This in turn results in more and more segmentation where disciplines break up into 'new disciplines' such as, for example, geophysics, biochemistry, molecular biology. These 'new disciplines' often result in departments and university programmes that in many cases are more and more focused on 'narrower' disciplines behind which enormous quantities of knowledge exist and which students are expected to deal with. Frodeman states that the disciplinary approach has, without a doubt, advanced our understanding of nature and has enhanced the development of technology.[10,11,17] Yet, a more holistic vision would ensure a clearer view directed towards the individual and to society and it is precisely the Humanities that provide insights into what it means to be human as well as encouraging us to think creatively about ourselves as human beings and asking questions about the world around us. We need the skills and knowledge of the Humanities in order to understand our cultures, and to be able to communicate effectively. The Humanities are more important than ever not only

on the social and national level, but on the global level as well. Within this series of 'contexts' we need to understand the role culture plays in people's lives.

A random search of university bachelor and master programmes in Europe, in principle reflects the expected disciplinary profile, or rather, the development of the above-mentioned 'new disciplines'. It would take a very serious study to thoroughly investigate throughout Europe exactly how university programmes are set up, the rationale behind them, and to what extent some universities embrace the concept of 'interdisciplinarity', which implies incorporating courses necessary for understanding the impact of a specific body of knowledge on the individual and society. This kind of analysis would of course be a major undertaking and goes far beyond the scope of this paper. However, our random search of university bachelor and master programmes in Europe did reveal a number of programmes that at least offered courses beyond the disciplinary boundaries. Here, we will list a couple of examples that in our opinion are to be commended because they go in the direction that transcends disciplinary borders:

- At the KU Leuven/University of Leuven, the Bachelor of Biomedical Sciences, apart from the expected disciplinary courses, has three compulsory courses in the first year – (1) Philosophical Reflection on Biomedical Sciences; (2) Economy; (3) Religion and Meaning of Life – as well as two optional courses, Sociology and Introduction to Medical Psychology and Health Psychology. Within the Masters programme of biomedical sciences at the same university, an elective course entitled Ethics and Law in Biomedical Research is offered. What should especially be stressed and commended is the Masters Programme in Bioethics at the KU Leuven, which is coordinated by the Centre for Biomedical Ethics and Law. The scope of the courses mentioned as well as the Masters programme in Bioethics opens up great opportunities for medical students for much wider insights into not only the technical knowledge necessary to acquire a biomedical degree but to understand more fully, and appreciate, what we have been stressing so far, that is the ramifications of this knowledge for human beings as well as for society.
- Another example of this kind can be found at the Karolinska Institute, Stockholm, with the programme for the Master of Biomedical Sciences: 'During the first semester, a course in biomedical communication including philosophy of science and bioethics is given.'[18]
- At the University of Edinburgh, the Medical Sciences Programme, 'A platform of compulsory courses delivers core material in biomedical sciences, medical sociology and medical ethics that underpins and directs advances in 21st-century medical practice. In addition, your option course choices offer you the flexibility to explore the broader biological, physicochemical, clinical and social sciences that underlie contemporary healthcare.'[19]

The examples cited come from the domain of biomedical sciences, and not surprisingly there is a strong push towards ethical issues as well as other areas of philosophy, economy, etc. The 'transdisciplinary nature' of these programmes can be seen as the

result of issues inherent in healthcare, the treatment of patients, the liabilities that can evolve after various treatments if not successful etc., but more importantly they introduce a holistic approach to knowledge that very often is presented at other universities as 'hardcore knowledge' in the sense of facts without additional interpretation of what these facts can mean.

However, when one views other programmes, for instance Physics, then at first sight it is possibly difficult to envisage additional courses as the ones previously mentioned. However, physics today has developed into many subdisciplines such as: quantum physics, particle physics, biophysics, medical physics as well as many more. It is precisely these 'subdisciplines', which are in fact disciplines today, that could profit from either compulsory or elective courses offering a philosophical view of nature, but again we stress possible implementations and possible benefits for individuals and society.

It is also very interesting to note that university programmes devoted solely to economics, in principle again do not offer courses that could widen the understanding of the possible ramifications of economic analyses as well as the implementation of different economic and financial measures. An exception to the general rule is the BA programme in Philosophy, Politics and Economics at King's College London as well as the Philosophy, Politics and Economics Programme at Vrije Universiteit Amsterdam. The concept behind this kind of approach is encapsulated in the following quote:

> Our Philosophy, Politics & Economics (PPE) BA course is a high-quality, interdisciplinary programme that will equip you with the skills and knowledge to understand and analyse the political and economic institutions of the 21st century, both in the UK and globally. This programme is taught by the Department of Political Economy and the Department of Philosophy.[20]

One of the key benefits stressed is that 'This course enables you to develop an understanding of the relationship between political and economic processes, institutions and ideas, and broader philosophical issues.'[20]

It could be said that the programme at King's College London goes a step further because, in the outline of the courses of this multidisciplinary programme, one finds titles of courses not only on ethical philosophy but also on theories of freedom, the philosophy of space and time, the philosophy of mind, etc.

The positive examples cited in different ways show that it is possible to broaden the concept of 'knowledge' in many ways, which brings us back to Mittelstraß's concept of 'orientational knowledge' which is by definition culturally defined and socially implemented.

When one views university programmes in the humanities disciplines, apart from philosophy, which by default covers ethics and ethical issues, the situation is more or less the same. Links towards natural phenomena, or the environment are, with a few notable exceptions, few and far between. What comes to the surface are multidisciplinary courses, for example, in environmental sciences, and programmes relating to climate change. It goes without saying that the Humanities programmes

could and should also benefit from a widening and an expansion towards fundamental issues that not only are relevant in the national sense, but also encompass important global social phenomena, because we need the Humanities to understand the role culture plays in people's lives at all levels, and last but not least, to encourage researchers and people in general to think creatively.

Conclusions

The question that arises from the above overview of possibilities of 'transdisciplinarity' that we find both in research and university education is how to start off the process of bringing together 'science' and 'culture'. If we follow 'knowledge' as one of the main components of culture, a relatively easy intervention in university programmes could be the introduction of a compulsory course provisionally entitled 'Bioethics', the aim of which would be to introduce the basic philosophical thoughts on multi- and transdisciplinarity, explicated in the above sections but with a strong stress on the questions: Why do we do science?, What are the ramifications for the individual?, For society?, How should knowledge from a contemporary point of view be seen as a many-layered phenomenon?[21]

A course of this kind would primarily widen understanding of the necessity of crossing disciplines and research domains and would raise the awareness of students to the fact that whatever study programme they have embarked upon has in different ways conceptual as well as concrete pragmatic implications for the world around us in its full cultural diversity and global dimensions. The importance of the individual, as well as individual societies, is necessary to contextualize not just knowledge acquisition but also to stress questions of how, for instance, various innovations can either positively or negatively affect humans, social groups and society in general. This can be seen as a 'bridge to the future' bringing about a new concept of knowledge, very much connected to what the American oncologist Van Rensselaer Potter, as far back as 1971, stated as the necessity of a bioethical approach to knowledge.[22] Through this concept he introduced the concept of 'wisdom' as a fundamental category for human beings:

> Wisdom may be defined as the knowledge of how to use knowledge for the social good. [...] Humanistic biologists should be organized into interdisciplinary scientific research and development groups with *survival* as their first goal. Societal competence may be defined as a function of wisdom and knowledge. (Ref. 22, p. 183, emphasis added)

Thus, an in-depth understanding of 'science' and 'culture' sees them not simply as areas of overlap, and especially not as areas of tension, but should see them as areas of mutual complementarity.

References and Notes

1. C.P. Snow (1998) *The Two Cultures* (Cambridge: Cambridge University Press), (with Introduction by Stefan Collini).
2. F.R. Leavis (1962) Two cultures? The significance of C. P. Snow. *Spectator*.
3. H. Spencer-Oatey (2012) What is culture? A compilation of quotations. GlobalPAD Core Concepts. Available at GlobalPAD Open House, p.2. http://go.warwick.ac.uk/globalpadintercultural

4. The importance of knowledge, experience and wisdom in many facets of research as well as university life are discussed in, E. de Corte, E. and J.E. Fenstad (Eds) (2010) *From Information to Knowledge; from Knowledge to Wisdom. Challenges and changes facing higher education in the digital age* (London: Portland Press).

5. J. Mittelstraß (1982) *Wissenschaft als Lebensform. Reden über philosophischer Orientierungen in Wissenschaft und Universität* (Frankfurt am Main: Suhrkamp)

6. J. Mittelstraß (2012) Science and values: On values and credibility in science and scholarship. *Rendiconti Lincei*, **23**(Suppl. 1), pp. 29–33 p. 32.

7. M. Gibbons, C. Limoges, H. Nowotny, S. Schwartzman, P. Scott and M. Trow (1994) *The New Production of Knowledge, The Dynamics of Science and Research in Contemporary Societies* (London: SAGE).

8. H. Nowotny, P. Scott and M. Gibbons (2003) 'Mode 2' revisited. *The new production of knowledge. Minerva*, **41**, pp. 179–194.

9. M. Gibbons (2002) Governance and the new production of knowledge. In: J. de la Mothe, (Ed.) *Science, Technology and Global Governance* (London: Routledge), p. 33.

10. R. Frodeman and C. Mitcham (2007) New directions in interdisciplinarity: Broad, deep, and critical. *Bulletin of Science, Technology and Society*, **27**(6), pp. 506–514.

11. R. Frodeman, J. Thompson Klein and C. Mitcham (Eds) (2010) *The Oxford Handbook of Interdisciplinarity* (Oxford: Oxford University Press)

12. W. Krohn (2010) Interdisciplinary cases and disciplinary knowledge. In: R. Frodeman, J. Thompson Klein and C. Mitcham, (Eds) (2010) *The Oxford Handbook of Interdisciplinarity* (Oxford: Oxford University Press), pp. 31–38 p. 31.

13. R. Brown, A. Deletic and H.F. Wong (2015) How to catalyse collaboration. *Nature*, **525**, September 2015.

14. https://horizon-magazine.eu/article/emotionally-literate-tech-help-treat-autism_en.html

15. http://www.dream2020.eu/

16. http://larics.fer.hr/

17. R. Frodeman (2014) *Sustainable Knowledge. A Theory of Interdisciplinarity* (New York: Palgrave Macmillan)

18. http://ki.se/en/selma/programme-syllabus/4BI11

19. http://www.ed.ac.uk/studying/undergraduate/degrees?action=subject&code=53&cw_xml=index.php

20. https://www.kcl.ac.uk/study/undergraduate/courses/philosophy-politics-and-economics-ba.aspx

21. For further details on the concept of 'bioethics', especially from a European perspective, see , A. Čović (2012) The Europeanization of bioethics. In A. Muzur and H. Sass, (Eds) *Fritz Jahr and the Foundations of Global Bioethics. The Future of Integrative Bioethics* (Berlin, Münster, Vienna, Zurich, London: LIT Verlag), pp. 194–196.

22. V.R. Potter (1971) *Bioethics: Bridge to the future* (Englewood Cliffs, NJ: Prentice-Hall)

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