

Triple Helix Partnerships for the Music Sector: Music Industry, Academia and the Public

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Abstract

What kind of partnerships are best placed to drive innovations in the music sector? Considering the continual appetite for new products and services within our knowledge economy, how can we ensure that the most novel and significant research can be applied in and exploited for the market? How can we ensure that the whole music sector, including the not-for-profit sector, benefits and is engaged in new knowledge production?

This paper represents an exploration of a partnership model – the triple and quadruple helix – that is specifically designed to drive innovation. Applying this to the music sector, the presentation will provide case studies relevant for driving innovations in music technology, the creative sector and digital innovations. It will cover both the for-profit sector and social enterprise, and emphasize the importance of partnerships and community for maximizing sustainability when devising research and development projects using helix system models.

1. Introduction and Background

All universities are involved in partnership work related to their research and enterprise interests. In the area of music technology this may include patenting music instruments, production of music scores, recordings and live performances and researching into new modes of composition and audio production. These activities are often contextualized academically as research and development (gadgets) or practice-as-research (engagement in creative processes). Within our own vision statement, we have a section that suggests we engage in 'transformational partnerships'. Like all other universities, we believe we make a real impact on the communities and commercial sectors with which we work.

This is specifically valid for the music sector, which interfaces heavily with external communities, related to cultural assets in forms of concert series, music in the community, music therapy or the music industry.

For academics and creative practitioners in the music technology sector, where subject matter straddles both science and art, technology and creative practice, often involving both commercial and social enterprise, there are questions about how to best to support partnership projects and how to improve the flow from a research stage to the application of these new insights into an external sector.

What makes the consideration of knowledge production in this area even more difficult is that within UK academia, there still seems to be an encultured difference between 'research' and 'enterprise', with the relatively new term on the block being 'knowledge transfer'. Universities may express their intention and policy of treating research and enterprise as a continuum, but just a brief look at career development opportunities within institutions, or research quality assurance frameworks, demonstrates a strong preference for basic research over enterprise. This represents a distinct disincentive for academia to engage more directly with industrial partners and/or communities representing end-users. This prioritization of basic research over applied research, or what has been termed as a prioritization of 'Mode 1' research over 'Mode 2 and 3' research, has the potential of slowing the knowledge exchange between academia and industry down, if not stopping it altogether.

Similarly, disincentive models exist in the area of social enterprise, often falling into the category of community engagement, widening participation and/or the 'civic duties' of a university. Many of these terms emphasize the perspective of the educating institution; they are university-centric and are conceptualized as activities that flow within and out of academia. It is this – an increasing number of academics and professionals would argue – which is problematic for forming partnerships that are impactful in allowing research and new knowledge to add significant value both to the sector and to society.

Specifically for music technology, the Higher Education sector divide between research and enterprise has meant that it is difficult for technological innovations coming out of universities to transfer quickly onto the market or external sectors. This difficulty in bringing an idea to the final market stage is perceived to be normal. The external sector thus often perceives universities as too slow to support innovation or to bring an application to market. The supporting structures and incentive models within academia often support the production of journal papers, but the journey from transferring this knowledge to developing a prototype, securing patents, developing market plans, designing for mass production and finally delivering a commercial product is so difficult that too many academically housed music technologists are opting for the traditional publish-a-paper route.

This situation does not need to be this way, and various voices from different sectors suggest that universities need to change the way in which they contextualize, value, incentivize and support research in order for the development of innovation and its application in society to happen much more instantaneously. Authors relevant for this debate are Etzkowitz [1], Carayannis and Campbell [2], Gibbons [3], Watson [4] and Boehm [5] among others, but there is also a wider relevant debate about the

role of universities today, including contributors such as Collini [6], Barnett [7, 8], Graham [9] and Williams [10]. The progressive terms relevant for the future are 'triple and quadruple helixes', 'Open Innovation 2.0' and 'Mode 3 research'.

To contextualize this in an example: if we look into the area of assistive music technologies, the market for technologies could be characterized as lacking competition and a consequently lacking diversity and choice. This is in an area where there is still a big end-user need. Supported by the research councils, the area of assistive music technology has always been one with a lively research and development community; many digital innovations are developed for specific special needs communities but they are far less often being turned into commercial products or refined towards mass production.

These challenges can be overcome more easily by having the right academia–business–government partnerships from the outset of a project, with a more collective and collaborative experience of both basic research and development, as well as application, commercialization and subsequent marketization. Additionally, with the new government-driven impact agendas for Higher Education, these issues are timely and relevant to a consideration of the role that universities play in society today. This paper thus focuses on communities, enterprise and the cultural sector involved in, or interacting with, music technological practices, making explicit the various interacting agendas with their respective stakeholders. It attempts to identify ways towards achieving a balance between inward- and outward-facing interests when considering collaborative projects that drive innovation.

The paper will use five main secondary sources: Etzkowitz [1], Watson [4], Carayannis and Campbell [2], Watson [11] and Gibbons [3]. These were written with a general academic perspective in mind, but I will apply the relevant themes in a specific music technology and arts context. The paper will apply these current concepts to innovation developments in music technology, covering both the for-profit and the not-for-profit sector. Providing example projects as case studies, I will suggest that triple and quadruple partnerships (e.g. helix models) between universities, industry, government and the civic sector (the not-for-profit and voluntary sectors) allow innovation to happen as a non-linear, collaborative process with overlapping processes of basic research, application and development. In this model, knowledge production (e.g. research) is not the sole concern of universities; and technology exploitation may not be the sole concern of industry; creating what has been called a 'socially distributed knowledge' [3] or a (Mode 3) 'Innovation Ecosystem' [2].

2. Research and Enterprise: A Personal Experience of Torn Identities

Universities are complex and diverse entities. Academics continually live in this 'super-complexity' [7]. They and their academic communities have shifting and changing agendas that – apart from education – allow individuals to engage in

research, in enterprise and in community-facing activities. The increase in managerialism, professionalism and centralization has introduced larger amounts of accountability and measurement, and it has followed that activities in the area of enterprise and research are often treated separately, in order to be supported and measured in detail (see also [12]).

A current theme within our knowledge economy is that there are increasing demands on universities to have an impact on society, to interface with the business sector, to commercialize and to be enterprising, while still having supporting structures and incentive models that see civic engagement, enterprise, research and education as very different spheres, supported often by different sections and policies within the same university. Thus the government-driven impact agendas have, probably unexpectedly, resulted in highlighting that the neo-managerialistic cultures with their specific accountability measures are increasingly becoming the barrier to a more holistic consideration of impact – one that exploits the multidirectional benefits of engaging in research, enterprise and civic engagement all at the same time.

I started to consider questions of how best to support collaborative knowledge production and innovation projects a few years ago, when I had to justify yet again why I – an academic at a research-intensive university – was involved in projects that my university at the time classed as *not* research, but ‘only’ enterprise. I have been involved in MPEG7 developments for mp3 audio files, community engagement and patenting of instruments, but all of these were difficult to justify as falling under the category of Research with a capital ‘R’.

I was confident to argue that all these activities produced new knowledge, and all resulted in peer-reviewed journal publications, the classic method for evaluating ‘researchiness’ in universities. However, there still seemed to be barriers within the university and the Higher Education quality frameworks to valuing something that does not show the classic linear progression from basic research, via dissemination through publications (co-authored in the sciences, single-authored in the arts and humanities), knowledge transfer and application, and external dissemination, to finally having some societal impact.

Similarly, until recently there were plenty of times when I had to argue that several of my projects which included communities and/or businesses were to be defined not only as exclusively ‘community outreach’ or ‘enterprise’, but actually as research in action. Even though there were publications as outputs, simply because the funding came from a heritage organization, or a business benefited from the knowledge produced, I seemed to be unable, or able only with difficulty, to collect those brownie points that would allow me to progress on my research-related ladder of academia. The incentives here were geared towards basic research, but not towards impactful community-facing or music-industry-facing product or service development.

This situation is changing fast, and I would suggest that now, after the first dust of the impact debate has settled, there is a real will to make university research (even) more impactful. One of the biggest shifts that allow universities to consider developing their research cultures into something different is the government's decision to make societal impact a substantial factor for evaluating the quality of research. This is important for universities because of the linked allocation of governmental research funding, now influenced not only by the peer-reviewed and perceived value of the piece of research as evidenced through academic publications, but also by the reach and significance that it has on the external sector, as evidenced through case studies.

Music technology academics have always found it hard to distinguish between technology and artistic practice, enterprise, community outreach and research. One simply has to consider the range of topics and diversity of speakers at the relevant international conferences in this area, such as the International Computer Music Conference, The Art of Record Production Conference or the new Conference for Innovation in Music. Many of the collaborative projects in the area of music technology simultaneously include partners from small and medium-sized businesses, cultural organizations and academia.

To make these developments even more impactful and effective, it is useful to consider partnership models in which knowledge production is not the sole concern of universities, just as technology exploitation may no longer need to be the sole concern of industry. Digital technology and the knowledge economy have allowed the spheres of academia and industry to be shifted, to be realigned. The question is, is this true of the research cultures within Higher Education? With knowledge traditions going back centuries, have they moved with the times, or are they possibly finding it too difficult to keep up with these societal developments?

The question emerged of what an ideal engaged *and* entrepreneurial university would look like, and this question involved dealing with understanding and resolving some of the tensions between outward- and inward-facing vested interests, research methodologies and how the quality of research and knowledge transfer is measured.

For each institution, there is the equilibrium of sustainability to be met in an ever-shifting climate of agendas – not a straightforward measurement, considering that the activities are often funded via a complex mixture of sources. This is where an explicit conceptualization of partnerships and vested interests helps.

2.1. Triple and Quadruple Helixes

The triple helix was first described by Etzkowitz in 2008 [1] and provided a conceptual framework for capturing, analysing, devising and making explicit various aspects of project partnerships, 'managing interactions among universities, business and government on common projects'.

The basic assumption of this conceptual model is that in our knowledge-based economy interaction between university, industry and government is key to innovation and growth. In a knowledge economy, universities carrying out research and development become a paramount asset in innovation-intensive production. This can be seen as a historical shift from industrial society, in which the primary institutions were industry and government, to the present knowledge-based society, where economies are much more tightly linked to sources of new knowledge and universities are becoming more important as structures with an everlasting flow of talent and ideas through their PhD and research programmes. Exemplars of this development can be seen in the emergence of university-owned and university-run science parks, incubators, cultural centres and enterprise hubs. Etzkowitz defines it as follows:

'The Triple Helix of university-industry-government relations is an internationally recognized model for understanding entrepreneurship, the changing dynamics of universities, innovation and socio-economic development.'^[1]

Universities in this context of a knowledge economy have the big advantage that they have an inherent regular flow of human capital, such talent and ideas. This is a distinct difference from the research and development sections of large businesses and industry, where the employment structure creates much less dynamics or mobility within its own human capital.

However, in this new economy, the different spheres each also take the role of the other, and there is a much greater overlap of remits and roles than in prior centuries. In this model:

- Universities (traditional role: teaching and learning, human capital, basic research) take the role of industry when they stimulate the development of new businesses through science parks and incubation hubs.
- Businesses (traditional role: place of production, vocational training, venture capital, firm creation) develop training to ever higher levels, acting a little like educational establishments, even universities (e.g. higher apprenticeship schemes).
- Government (traditional role: regulatory activities, basic research and development funding, business support, business innovation) acts often as a public venture capitalist through research grants and studentships, including, for instance, knowledge transfer partnerships.

This overlapping of the formerly distinct roles of three different spheres (in the case of the triple helix) suggests that the traditional stages of knowledge transfer from

- Stage 1: government – university (example: research grant)
- Stage 2: university – business (example: incubator)
- Stage 2: government – business (example: business start-up grant)

overlap much more, and more often, than they have done traditionally.

Etzkowitz's model was expanded in 2012 by Carayannis and Campbell to include the third sector, and with it universities' own civic engagements. Watson [4, 11, 13] has foregrounded this latter role; his concept of the 'engaged university' proposes that social enterprise and the not-for-profit sector should be considered within the helix model. His international comparison of the way universities engage with their respective communities provides a strong articulation for academia to consider new knowledge production models that allow a greater interaction between universities on the one hand and both the public and industry on the other, for example for universities to become (even?) more engaged.

Various arts-related initiatives have attempted to use these models to initiate innovation [14, 15]. Similarly, because of their inherent use of inter-, multi- and trans-disciplinary knowledge production methods, the potential that helix partnerships provide for managing large-scale and multi-partner projects allow these concepts to come to the fore in considerations of the world's largest challenges. Addressing its impact potential on the socio-economic aspects, Watson suggested that in this new era universities have to become more 'engaged', and he specifically points his finger at universities in the northern hemisphere [4].

At the core of this debate stands the notion that our classic (northern hemisphere) research methodologies and their related cultures, frameworks and value systems are preventing us from increasing the impact on society. Universities that value socio-economic impact will thus always have an emphasis on partnerships between universities, industry, government and the civic sector (the not-for-profit and voluntary sectors).

Not only will these quadruple partnerships better support innovation, but they will allow innovation to happen in a non-linear, collaborative manner with overlapping processes of basic research, application and development. In this model research is not the sole concern of universities, and technology exploitation may be not the sole concern of industry, creating what has been called a 'socially distributed knowledge' [3] or a (Mode 3) 'Innovation Ecosystem' [2].

These debates feed into an ever-increasing discourse around the comparative appropriateness of various research methodologies for benefiting the real-life problems of society, from inter-disciplinary or trans-disciplinary methodological considerations to practice-as-research [16] and the creative practitioner; from the challenges of big, co-owned and open data or non-linear collaborative methods for producing knowledge.

What have given a renewed focus on how academia interfaces with communities outside of itself, allowing the Higher Education sector to produce knowledge that has real impact, are the last Research Excellence Framework (REF) in 2014 and the government-driven agendas concerning impact. The last REF could be seen as a collection of quality assessment methods that collectively have an inbuilt tension of,

on the one hand, a more traditional, linear knowledge production culture (Gibbons's Mode 1 knowledge production model) and, on the other, an impact-driven, non-linear mode that values socially distributed knowledge more than discovery (Gibbons's Mode 2 knowledge production model) [5].

2.2. Gibbons, Carayannis and Campbell and their Knowledge Production Models

Mode 1 and Mode 2 were knowledge production models put forward by Gibbons back in 1994. Several authors of the past decade have picked up and further developed his concepts with relevance for the current impact agendas. The relevant works include Etzkowitz's 'The triple helix' [1], Watson's *The engaged university* [4], Carayannis and Campbell's *Mode 3 knowledge production* [2] and Watson's *The question of conscience* [11].

Gibbons conjectured that Mode 1 knowledge production was a more 'elderly linear concept of innovation', in which there is a focus on basic research 'discoveries' within a discipline, and where the main interest is derived from delivering comprehensive explanations of the world. There is a 'disciplinary logic', and these knowledge production models are usually not concerned with application or problem solving for society. Quality is primarily controlled through disciplinary peers or peer reviews; Carayannis and Campbell add that these act as strong gate keepers. Success in this model is defined as quality of research, or 'research excellence' and both Watson [4] and Carayannis and Campbell [2] suggest that our Western academic cultures still predominantly support the Mode 1 knowledge production model. The REF's focus on scholarly publication and its re-branding to include the term 'research excellence' may be considered as emerging from a culture surrounding the traditional Mode 1 knowledge production.

But Gibbons had already put forward a different way of producing knowledge, in which problem solving is organized around a particular application. He suggests that the characteristics of this mode are greater inter-, trans- and multi-disciplinarity, often demanding social accountability and reflexivity. The exploitation of knowledge in this model demands participation in the knowledge production process; and the different phases of research are non-linear, for example discovery, application and fabrication overlap. In this model, knowledge production becomes diffused throughout society for instance a 'socially distributed knowledge', and within this, tacit knowledge is as valid or relevant as codified knowledge [3]. Quality control is exercised by a community of practitioners 'that do not follow the structure of an institutional logic of academic disciplines' [3], and success is defined in terms of efficiency and usefulness in contributing to the overall solution of a problem [17]. Mode 2 is seen as a natural development within a knowledge economy, as it requires digital and IT awareness and a widely accessible Higher Education system. Research cultures using Mode 2 models often initiate a greater sensitivity of impact of knowledge on society and economy.

Obviously, the two modes currently exist simultaneously in various research communities, and have done so for a long time. Various terms emphasize the different nuances of the ongoing impact debate, from applied research, through knowledge exchange, to definitions of research impact. However, as Watson [4] contends, there is a distinct divide between the southern and northern hemispheres in how academia tends to see itself and its role in relation to society, and embedded in this is how research value is conceptualized.

In the northern hemisphere academia generally comes from a Mode 1 trajectory, that is, Mode 1 knowledge production is, more often than not, considered to be the highest form of research. This is reinforced by publicly funded research that creates a sense of entitlement [4], and generally there is more panic about the decline of interest in scientific and technological study, with many degrees being kept alive by students from overseas. For universities in the northern hemisphere, Watson's list of characteristics includes the following:

- They derive much of their moral power from simply 'being there'.
- They are aware of their influence as large players in civil society.
- They stress role in developing character and democratic instincts.
- They focus on contributions like service learning and volunteering.
- They see public support for the above as an entitlement.
- The main model of contribution is knowledge transfer.
- They have developed from a culture in which Mode 1 is valued as the highest form of research.

This cultural stance can also be detected in the role that universities play as cultural patrons. There is a sense that art is entitled to public funding, and there is a long history of publicly funded art – specifically in the UK.

For universities in the southern hemisphere, civic engagement is an imperative, not an optional extra. Watson writes that in his team's enquires, 'we were constantly struck in our Southern cases, by how much was being done by universities for the community with so little resources (and with relatively little complaint)' [4].

'Practical subjects' and 'applied' research take priority and with them comes a different value system for the role of research: the Mode 2 knowledge production model prevails [3, 4]. Thus Watson sees Mode 2 as a more progressive developmental stage of Higher Education in reference to societal impact and civic engagement. His list of characteristics includes:

- It simply is more dangerous – there is no comfort zone.
- There is an acceptance that religion and sciences should work in harmony.
- There is a general use of private bodies for public purposes.
- International partnerships are for assistance, not 'positioning'

- Challenging environments¹ where many attacks on universities seem to be connected to various governments' efforts to prevent opposition movements, restrict political debate or criticism of policies [18].
- There is frequently a central political drive for outcomes like 'transformation' (South Africa) or 'solidarity' (Latin America) (Leibowitz 2014:47).
- There is a privileging of 'development' (or social return) over 'character' (and individual return), of 'national cohesion' over 'personal enrichment'; and of 'employment' (human capital) over 'employability' (SETs (Science-Engineering-Technology) over arts).
- International partnerships are there for assistants, not 'positioning'.
- 'Above all "being there" doesn't cut much ice; there is a much greater sense of societal pull over institutional push' [4].

Thus, there is a predominant engagement with Mode 2 knowledge production.

In 2012 Carayannis and Campbell expanded the concept of Modes 1 and 2 to include a Mode 3 knowledge production model, defined as working simultaneously across Modes 1 and 2. Adaptable to current problem contexts, it allows the co-evolution of different knowledge and innovation modes. The authors called it a 'Mode 3 Innovation Ecosystem' which allows 'GloCal' multi-level knowledge and innovation systems with local meaning but global reach. This values individual scholarly contributions less, and rather puts an emphasis on clusters and networks, which often stand in 'co-opetition', defined as a balance of both cooperation and competition.

3. Case Studies

For the music sector, there are various opportunities that a more structured partnership approach can seize. Two of own research areas can act as examples of how Mode 3 thinking and a helix partnership approach benefit all the sectors involved – the music industry, the public, academia and government – with its societal and economic imperatives.

¹ For example, 2012 northern Nigeria, Federal Polytechnic in Mubi, 46 students killed, pretext student union election. 2013 Nigeria, gunmen killed at least 50 students. 2013 Syria, University of Aleppo, 82 students killed. 2014 Ethiopia, a bomb killed 1 and injured more than 70. 2015 Kenya, Nairobi, Somali militants burst into a university in eastern Kenya on Thursday and killed nearly 150 students. For a full report see Global Coalition to Protect Education from Attack, 'Education under Attack 2014', GCPEA, New York 2014. <http://protectingeducation.org> Last accessed 09/05/2015.

3.1. Case Study 1: Hard and Software Developments and Assistive Music Technologies

Music Technology is taught in the UK in various departments, according to UCAS by 103 providers to be exact, with more than 200 degrees situated somewhere within and between the disciplines of Computer Science, Electrical Engineering and the arts. Innovation happens in all of these, and specifically the more 'gadgety' type of innovation often needs industry-related experience and a knowledge of developing products from an idea to a mass-produced item for sale. Although in general Electrical Engineering and Computer Science departments have still more experience in these processes than arts and humanities departments, even here there are barriers that do not always allow good ideas to be developed into products. In view of the fact that our new knowledge economy needs *more* products, a more *diverse* range of products and *cheaper* products, the pathways from initial research to product really do need to be shortened. The industry sector is geared up for this, and modern innovations such as 3D printing and rapid prototyping have made the production of diversity in product development cheaper than it ever was before.

In fact, there have been plenty of individual instrument developments as part PhD studies and funded research projects; but of these, only the smallest number of ideas and prototypes have been developed towards industry exploitation. Plenty of examples exist where a prototype represents the final stage of the research project, and the lack of collaboration and/or incentives for individuals to develop it to marketization, as well as a real lack of incentive models within institutions, keep the knowledge just there with the individual. This individual often stays within academia, and is thus able to gain career advantages not by marketization, but by publication of the idea and concept. This may still be seen as a classic form of the ivory tower. Thus for the area of instruments or gadgets for special needs musicians, there is a distinct need to shorten the pathways from university research to market availability.

As one solution, we have been developing projects based on the quadruple helix model and a Mode 3 research methodology. In it we connect special needs communities with the micro and SME (Small and Medium Enterprise) market, supported by innovations derived from university research by PhD students and academics. The idea is for us academics to collaborate on developing a new series of digital innovations together with end-users and SME developers. Thus the knowledge will not be located only within the Higher Education institution, but will be shared among the partnership, and – importantly – between SME and Higher Education.

In Gibbons's terms, knowledge will thus be (more) socially distributed in this non-linear model, and discovery, application and fabrication will overlap. The control of quality will be exercised by the community of practitioners who (and I quote Gibbons again) 'do not follow the structure of an institutional logic of academic disciplines' [3]. These disciplines should not be relevant for evaluating the quality and success, as this is not defined by the Mode 1 model in terms of excellence (evaluated by peer

review), but by Mode 3 models and in terms of efficiency, usefulness and contribution to an overall solution to a problem.

Obviously, university structures still tend to show some friction with these new conceptualizations of research and how to value it. But unless we want Europe to continue to fall behind in entrepreneurial and innovative activities, universities will need to find new ways in which to support and incentivize academics in a Mode 3 research model, in order to boost the economy of our knowledge society through real innovation based on knowledge production.

3.2. Case Study 2: Music- and Arts-Related Multi-Professional Work

Similarly, in another European project (see Figure 1) we are developing training packages for multi-professional or inter-agency community arts and community music workers. This project is simultaneously a community arts project in itself and a project to define and develop new multi-professional working skills and environments for professionals in art and social work.

Music of course has a big potential for engaging with external communities, whether it is in the context of being a cultural asset (concert series), a creative practice (music production, audio engineering, composition, performance), music therapy (assistive music technologies), music technology (plugins, apps), or simply being an anchor

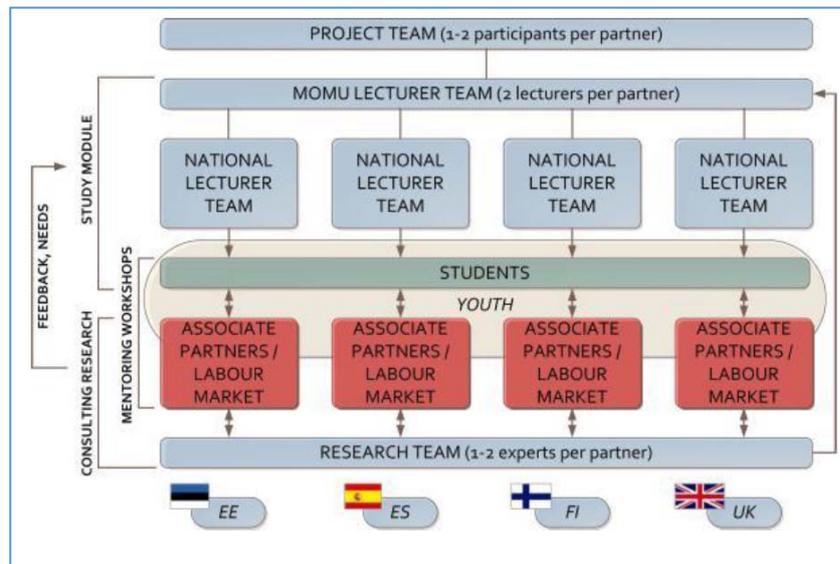


Figure 1. Structure of the MOMU project (multi-professional working skills for professionals in arts and social work)

for economic regional growth and supporting new talent from all areas of the music industry and the creative sector.

In this project, however, the *new* knowledge (the definition and identification of skills and competencies in an inter-agency or multi-professional community arts setting) is gained within a partnership that includes:

- lecturers, representing academia;
- artists, representing the creative industry;
- end-users, community;
- and the European Commission, representing the governmental part of the helix.

It is no wonder that this is likely to be a Creative Europe-funded project, and not a Horizon 2020 project. Creative Europe, with its cultural and socio-economic mission, is perceived to be a more appropriate funding body to target projects that use Mode 3 research, as their activities and outputs are still considered more under the headings of community outreach, cultural work and enterprise.

However, even Bror Salmelin [19], a director-general of the European Commission, who presented at a European conference in Finland recently, emphasized the need



<i>Closed innovation</i>	<i>Open innovation</i>	<i>Open innovation 2.0</i>
<i>Dependency</i>	<i>Independency</i>	<i>Interdependency</i>
<i>Subcontracting</i>	<i>Cross-licensing</i>	<i>Cross-fertilisation</i>
<i>Solo</i>	<i>Cluster</i>	<i>Ecosystem</i>
<i>Linear</i>	<i>Linear, leaking</i>	<i>Mash-up</i>
<i>Linear subcontracts</i>	<i>Triple Helix</i>	<i>Quadruple Helix</i>
<i>Planning</i>	<i>Validation, pilots</i>	<i>Experimentation</i>
<i>Control</i>	<i>Management</i>	<i>Orchestration</i>
<i>Win-lose game</i>	<i>Win-win game</i>	<i>Win more-Win more</i>
<i>Box thinking</i>	<i>Out of the Box</i>	<i>No Boxes!</i>
<i>Single entity</i>	<i>Single Discipline</i>	<i>Interdisciplinary</i>
<i>Value chain</i>	<i>Value network</i>	<i>Value constellation</i>

Figure 2. Bror Salmelin, director-general of the European Commission, discusses the differences between Closed and Open Innovation

for the European research community to embrace Open Innovation 2.0 models, including quadruple helix thinking (see Figure 2.)

4. Conclusion and Ways Forward

Bearing in mind Watson's suggestion that in the north we tend to engage predominantly in Mode 1 research (in contrast to the south's Mode 2), and thus are consequently somewhat less engaged in partnerships that could be considered triple, quadruple or even quintuple [2] helix models, it may be worthwhile to consider that even in the north, partnership work in publically funded research has been the norm. Thus, although they are not consciously implemented or explicitly formulated in policy, project parameters that conform to helix models can be identified extensively.

The concept itself, however, gives us various opportunities that have yet to be explored more widely, specifically in the music industry and cultural sector. The model has been evidenced to enhance innovation, and with the reduction of funding for the arts, universities – with their large sustainable amount of human capital – must increasingly become the place of viable patronage. Partnership models are thus increasingly important. The model also allows industry to have access to Higher Education research, without the more lengthy traditional routes of research – knowledge transfer – commercialization. In this model, the whole partnership will be (more or less) engaged in the research process, as well as in the commercialization. Where models have been adapted in other commercial sectors, the path to market has been shortened [14].

Project partnerships that have engaged in helix models report a better knowledge exchange and more effective partnership work for securing further funding to develop additional products. Helix partnerships help sustainable collaborations to emerge [14]. Finally, the powerful conceptual framework allows us to leverage stronger policy around research funding – allowing Mode 3 research partnerships to become more the norm and thus maximizing impact. Implicit examples for these can be seen in the EU's Creative Europe Programme.

The explicitness of the model allows the capture, analysis, reflection and explicit making of various aspects of project partnership work. With these in place, project interactions between universities, business, public and government can be managed in a rigorous framework of relationships.

With the realization that universities need to engage more, as evidenced by the current impact agendas within academia, and to maximize their impact of their own research, the debate on how to foster partnerships that more effectively turn new knowledge into benefits for industry and society has begun. Helix partnerships, Mode

3 research models and Open Innovation 2.0 are the concepts that are currently considered to be a solution.

For the music industry, if the UK wants to exploit the talent and creativity it has within its midst, partnership work between SMEs, academia and the public is essential. Mode 3 research and triple and quadruple helix structures for partnerships are the best way forward.

References

- [1] Etzkowitz, H. The triple helix: university-industry-government innovation in action. Routledge, New York (2008).
- [2] Carayannis, E. G. and Campbell, D. F. J. Mode 3 knowledge production in quadruple helix innovation systems: 21st-century democracy, innovation, and entrepreneurship for development. Springer, New York and London (2012).
- [3] Gibbons, M. The new production of knowledge: the dynamics of science and research in contemporary societies. SAGE Publications, London and Thousand Oaks, CA (1994).
- [4] Watson, D. The engaged university: international perspectives on civic engagement. Routledge, New York (2011).
- [5] Boehm, C. 'Engaged universities, Mode 3 knowledge production and the Impact Agendas of the REF' in Next steps for the Research Excellence Framework. Higher Education Forum. S. Radford, ed. Westminster Forum Projects, London (2015).
- [6] Collini, S. What are universities for? Penguin, London and New York (2012).
- [7] Barnett, R. Realizing the university in an age of supercomplexity. Buckingham. Society for Research into Higher Education and Open University Press, Philadelphia, PA (2000).
- [8] Barnett, R. Reshaping the university: new relationships between research, scholarship and teaching. Society for Research into Higher Education and Open University Press, Maidenhead (2005).
- [9] Graham, G. Universities: the recovery of an idea, 1st edition. Imprint Academic, Thorverton, England, and Charlottesville, VA (2002).
- [10] Williams, G. L. The enterprising university: reform, excellence, and equity. Society for Research into Higher Education and Open University Press, Buckingham (2003).

- [11]Watson, D. The question of conscience: higher education and personal responsibility. Institute of Education Press, London (2014).
- [12]Deem, R., Hillyard, S. and Reed, M. I. Knowledge, higher education, and the new managerialism: the changing management of UK universities. Oxford University Press, Oxford and New York (2007).
- [13]Watson, D. The question of morale: managing happiness and unhappiness in university life. McGraw-Hill, Maidenhead (2009).
- [14]R. Clay, R., Latchem, J., Parry, R. and Ratnaraja, L. 'Report of CATH Collaborative Arts Triple Helix' (2015).
- [15]Carayannis, E. G., and Campbell, D. F. J. 'Developed democracies versus emerging autocracies: arts, democracy, and innovation in quadruple helix innovation systems'. Journal of Innovation and Entrepreneurship, Vol. 3, p. 23 (2014).
- [16]Linden, J. 'The monster in our midst: the materialisation of practice as research in the British Academy'. PhD thesis, Department of Contemporary Arts, Manchester Metropolitan University, Manchester (2012).
- [17]Carayannis, E. G. Sustainable policy applications for social ecology and development. Information Science Reference, Hershey, PA (2012).
- [18]G. C. t. P. E. f. Attack, "Education under Attack 2014," GCPEA, New York 2014.
- [19]Curley, M. and B. Salmelin, B. "Open Innovation 2.0: a new paradigm'. 2015.