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SUSTAINABLE ENTREPRENEURSHIP AND INNOVATION – POLICY PAPER

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ENHANCING POLICIES AND PRACTICES AT UNIVERSITIES OF TECHNOLOGY

BRINGING INNOVATION AND ENTREPRENEURSHIP INTO THE ACADEMIC HEARTLAND OF UNIVERSITIES

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SUSTAINABLE ENTREPRENEURSHIP AND INNOVATION

BACKGROUND

The ENHANCE Work Package on Sustainable Entrepreneurship and Innovation (SEI) has worked towards establishing an ENHANCE network for learning and developing competence on SEI. We have also developed learning content and activities for students by holding summer schools on SEI, defining the framworks for an ENHANCE Certificate within the field and co-organising a pan-European business competition. Within the work package we have also established an alliance-wide mentoring system for sustainable entrepreneurship, created a database for open positions in start-ups and developed a toolkit for sustainable European entrepreneurship education. This policy paper is a result of the collaboration and discussions within the work package.

SUMMARY

Technical universities are the breeding ground for sustainable solutions to societal challenges. Innovation and entrepreneurship can and should move into the academic heartland of teaching and research, keeping sustainability as an obvious and embedded part of this action. When faculty invite students and others to innovate around their research, they achieve three effects: explore more sustainable innovation, offer entrepreneurial experiences, and ensure their research stays are relevant. Given these benefits, it is time we adjust policies and practice to enable (and not disable) such developments. The three missions of universities (education, research, and utilisation) need to be connected, not siloed. Innovation and entrepreneurship need to be something faculty owns not something mainly built above faculty or in the university ecosystem periphery.
The paper develops arguments for more sustainable innovation and entrepreneurship in the university heartland. It investigates how policy and practice affects such development. Real-life examples are offered. Finally, advice for policy and university practices are summarised.

THE CASE FOR INNOVATION AND ENTREPRENEURSHIP

The academic heartland[1] is where faculty have their main duties around education and research. The academic heartland is also where university students gain their credits and thus spend much of their productive time. When asked about their experiences in universities, students often reflect on the impracticality or detachment from practice of some of the courses they have completed. This can be understood in relation to the demands of academic knowledge as well as the demands of the everyday society. These demands follow similar but different logics and aim to intersect with various aspects of and in the society.

One of the ways to bridge the gap between what we teach students in universities and what the society expects them to be capable of is to train them in entrepreneurship and innovation which is grounded in sustainable principles. Involving innovation and entrepreneurship in the heartland basically

[1] Clark uses "academic heartland" as one of five main areas where entrepreneurial universities develop their capabilities. The others are a strengthened steering core, an enhanced development periphery, a discretionary funding base, and an entrepreneurial culture CLARK, B. R. 1998. Creating Entrepreneurial Universities: Organizational Pathways of Transformation, New York, Pergamon Press.

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means that faculty and students together engage in the question "where can this knowledge be made valuable in society?" Answering this question then requires faculty and students to leave the classroom and connect with potential stakeholders[2], those critical in realising any initiative, and more importantly, those who benefit from initiatives. Nudging students toward this direction motivates them to better understand the nature of the subjects taught. There is value for the faculty too. Faculty benefit from feedback and interactions with (new) stakeholders, that ultimately can contribute to research output and make research more relevant. Bringing innovation and entrepreneurship which is sustainably grounded front and center allows for innovative solutions to be developed more systematically[3].

VALUE AND CO-CREATION

One may wonder, are we really proposing innovation and entrepreneurship, something strongly associated with markets, commercialisation and capturing of financial value, as vital and viable in the academic heartland? Innovation and entrepreneurship have always had value-creative and co-creative sides (i.e., the additional benefit created in transforming input to output), but often disguised by the public image of an entrepreneur focusing on value capture (i.e., the ability as a business to capture that value as retained profit). Innovation and entrepreneurship are better grounded when seen as means (e.g., dealing with uncertainty) rather than ends (e.g., to reach a market). Commercialisation is just one of many ways to pursue innovation and entrepreneurship. For example, much of sustainable innovation requires activities not necessarily associated with commercialisation. Take stakeholder involvement or life-cycle analysis. They generally lead to action points that are not entirely conducive to the commercial goals of an economic activity.

The main point is that innovation and entrepreneurship, when enabled and asked for, open up for individuals to co-create around an uncertain future. But this is not enough. We need to position universities of the future to respond to calls and demands from the society to push the society toward more sustainable ways of innovating and entrepreneuring. Faculty and students who explore this open uncertain space are blessed with learning and a sense of achievement, although they might not be the ones eventually capturing any economic value. They can instead institute seismic changes in how our societies view resources, equality, equity, inclusion, etc.
To be sure, our case for innovation and entrepreneurship at universities is not new. Many before us have made compelling arguments that universities should be at the forefront of innovation and entrepreneurship. In fact, universities have always been cradles for innovation. What is at the core of our argument is that the academic heartland can be systematically shaped to accommodate the training of innovation and entrepreneurship principles and bring about much more potential innovation in more sustainable ways, while also enriching education and research. But how can innovation and entrepreneurship be enabled?

HOW INNOVATION AND ENTREPRENEURSHIP IS ENABLED OR DISABLED

Do faculty today know that they have the key for more innovation and entrepreneurship? And if so, are conditions sufficient for them to use that key? Although there is a growing awareness, most faculty still do not know how much of a difference they can make if

[2] LACKÉUS, M. 2016. Value Creation as Educational Practice - Towards a new Educational Philosophy grounded in Entrepreneurship? PhD Kappa, Chalmers University of Technology.

[3] LUNDQVIST, M. A. 2014. The importance of surrogate entrepreneurship for incubated Swedish technology ventures. *Technovation,* 34**,** 93-100.

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they introduce innovation and entrepreneurship into their teaching and research.

The benefits from more real-life value-creating innovation and entrepreneurship education are just beginning to spread. Most faculty still stick with more traditional pedagogy that focuses on systematised problem solving and programmatic decision making. In other words, there is too much focus on technologies of rationality as opposed to technologies of exploration and foolishness[4]. Research-wise things might be more explorative and speculative in research results that are prepared for academic publications. This combination does not automatically favor reaching out and creating value with and for (new) stakeholders. While this can be more effectively enabled by the existence of more project-based courses linked to research, flexible educational constructs to enable this might not be at hand or require too much time to get in place.

Given these obstacles, faculty would be encouraged to enable themselves if there were clear incentives in place. Firstly, there need to be a push to run project-based courses valorising research in different directions where innovative paths to creating value for others is at the front and center. This includes having the physical spaces, the ease of starting a course, help with handling projects as well as team-work learning, and perhaps even intellectual property and incubation support for projects that move on.

Moreover, faculty promotion strategies should clarify that personal investment by the faculty into having more innovation and entrepreneurship as part of courses counts as merits. To be clear, none of these incentives require a large upfront investment while the benefits they can result in are substantial: more sustainable innovation, more entrepreneurial experiences and learning, and more relevant research. However, to our knowledge, only pieces of this vision are fully in place in any university. Instead, many of the practices and policies are (or are seen by the faculty) as discouraging to create more sustainable value while offering good learning.

ILLUSTRATIVE EXAMPLES THAT HAVE BEGUN TO MAKE A DIFFERENCE

At Chalmers, there have been a few initiatives that have been run for a number of years. One is Chalmers School of Entrepreneurship that was founded in 1997. The other are the TRACKS courses that focus on interdisciplinarity in form of projects. The last one is a chemistry course with entrepreneurial projects. These examples illustrate just how diverse the approaches and viabilities of outcomes can be.

TRACKS project course

TRACKS courses while part of Chalmers' portfolio of courses, do not belong to a specific study programme or any department. The core concept is that students collaborate on solving relevant challenges that are based in real work problems, as often solving complex problems requires interdisciplinarity, students from across disciplines and programmes band together in these courses. The TRACKS courses are elective and are framed and practiced as interdisciplinary, open to students at either basic or advanced level and to Chalmers alumni. These courses can be taken as a part of a programme or as an extra curriculum. Through these courses, students may learn

[4] MARCH, J. G. (2006). Rationality, foolishness, and adaptive intelligence. *Strategic management journal*, *27*(3), 201-214.

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more about subjects that are not included in their ordinary study programme.

Chalmers School of Entrepreneurship

This programme is designed as an environment where entrepreneurship is experienced and not only taught in classrooms. Students work on real venture projects that are supplied by idea providers during their education and apply their knowledge, creativity, and entrepreneurial ability to advance toward incorporating a viable venture. The mix of students with backgrounds in engineering, business, economics, law, science, and design creates a transdisciplinary environment that enables students to take a more expansive view of the problems they aim to solve.

Chemistry course with entrepreneurial project

Starting with a standard course in Surface Chemistry, building upon lectures and lab work. The professor wanted to bring a value creation for others perspective – where students would bring what they learn in the course to individuals outside the classroom – so he added an exercise for students to film their work, with explanation, and then comment and share these videos with others. One example was a video where a student presented soap bubbles, explaining the surface chemistry in a fun and easy to understand manner, which they argued could be interesting and useful for children, or primary teachers.

Students commented that the learning was multi-faceted, as they had to know about the subject matter they were presented, but they also had to learn how to present their ideas without guided instruction, and ensure that what they were presenting could be understood by others, thus translating the knowledge they gained. Students commented that this was an important skill for their future as engineers in the work-force, that they should be able to be given a problem and not just come up with an answer, but solve it and explain that solution to others, or build upon the answer.

ADVICE FOR POLICY AND UNIVERSITY PRACTICE

There is a strong case for more innovation and entrepreneurship in the academic heartland. If faculty open up for entrepreneurial experiences through courses and research, then there will not only be good learning – through co-creation under uncertainty – but there will also be more verification of sustainable innovation. Research itself becomes more relevant. In no other place than in the academic heartland can you achieve three such important effects in tandem. And yet the potential is still so unrealised. For the European Union having strong ambitions around sustainable innovation and entrepreneurship, the door is wide open to start targeting the academic heartland more. Below are some overarching recommendations.

1. FOCUS ON TARGETING THE HEARTLAND RATHER THAN PERIPHERY OF UNIVERSITIES

Much innovation and entrepreneurship policy target the periphery of universities rather than the heartland. However, the potential is higher in the heartland and the effect are threesome: innovation, learning and more relevant research. Programmes need to recognise that ultimately it is faculty choosing to engage into innovation and entrepreneurship initiatives, and when that happens they should be given support: coordinative, facilitative, physical premises and scaling up support (IP management, incubation, seed financing).

2. ACKNOWLEDGE AND TACKLE THE CHALLENGE OF LIMITED RESOURCES

Such recommendations are not without challenges: engagement and integration require time – one of the most precious and sparse resources in the academic heartland.

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There is potential for generation of bottlenecks at critical interfaces or pinch points common to the academic cycles, suggesting that universities need to be more agile. Universities must also build and sustain the ability to assess quality and appropriate determination of ideas.

There are additional financing challenges at different stages of development – from exploration of new value that can be commercialised through transformation into society and then sustained growth. Each stage requires time and consideration, particularly to situate sustainable perspectives and practices at the core. Furthermore, facilitating progression through stages of development requires that advice and support systems are integrated and sustained as part of the heartland rather than at the periphery, including mechanisms for effective handovers. And, there are different considerations at the different stages – for example allocating focused time and space for faculty to engage in innovation and entrepreneurship, an action which is then also appreciated as part of their core responsibilities as academics where applicable.

3. ENCOURAGE MICRO-CREDENTIALS ON SUSTAINABLE ENTREPRENEURSHIP AND INNOVATION

In the European arena there is a strong case to use micro-credentials as a way of enabling more innovation and entrepreneurship at universities. Micro-credentials have the potential to become a major flexible tool to spread initiatives around innovation and entrepreneurship within and especially between European universities. Faculty who are interested in initiating more innovation and entrepreneurship, should get access to tools that help them encourage good entrepreneurial competence development.

4. ENCOURAGE UNIVERSITY FACULTY TO ENGAGE IN EXTRACURRICULAR ACTIVITIES

University practices also need to incentivise faculty running innovation and entrepreneurship initiatives as a result of their research and as part of their courses. Such engagements need to become a clear merit and not be seen as a personal career risk. Physical infrastructures need to be adapted to accommodate more innovation led by students and others. Curricular obstacles need to me minimised, for instance through the use of micro-credential systems in collaboration between universities.

5. CAPITALISE ON THE EU SUSTAINABILITY-DRIVEN SETTING

Universities within the EU are operating in democracies engaged in sustainable development. Innovation and entrepreneurship in EU universities are thus different from the commercially oriented entrepreneurship we see from leading US universities. Their financial success is at the core. In the EU setting, the vision and push are to enable co-creating solutions that advance efforts toward sustainability transitions. The academic heartland is where much of this can happen, at least in its critical early phases. Here deep-tech and social solutions far from any market can be given care and engagement by faculty and students, while they gain entrepreneurial experiences.

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