THE LONG ROAD OF COLLABORATIVE INNOVATION
HOW THE GAME IS CHANGING WORLDWIDE
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MESSAGE FROM THE EDITOR

In this issue of UIIM we bring you the results of a longitudinal study of university engagement in the UK together with some great stories of innovative game-changing individuals and organisations that are working to be the driving force of the social and economic development of their regions. In spite of their diversity, each of them show a story of people that took the less congested road or that made their own one with the aim of making a difference in other people’s lives.

In our first article, Prof. Alan Hughes from Imperial College London, summarises the findings of a 10-year longitudinal study about engagement in UK universities. Among other results, it shows that while commercialisation activities remain very low, academics mostly engage in people-based activities, such as attending conferences, participating in networks or giving invited lectures with the main motivation of gaining insights in their area of research.

Following this article, Siep Littooij, a Dutch academic with over 20 years of experience working with Vietnam, describes the results of an initiative of the Vietnamese Ministry of Education and Training about profession-oriented higher education. Since the analysis of the university-business cooperation ecosystem showed the lack of awareness, incentives and prior experience, the government has already taken measures to increase student employability, such as the compulsory analysis of business requirements before creating or changing any curriculum.

Another governmental organisation is committed with university-business cooperation is the European Commission, who funds an initiative to analyse this cooperation in the 33 country of the European Economic Area: its typology, barriers, drivers, opportunities and challenges. A group of academics, associations, consultants and 33 country partners are seeking qualitative and quantitative evidence to increase our understanding of this topic.

By the way, have you ever wondered what makes a university entrepreneurial? UIIM gets into the Dutch Entrepreneurial University of the Year according to Elsevier/Scincencesworks. In Twente University we explore some of the reasons of this nomination, including their main approaches to industrial partnership and some of their recognised programmes to get inspired and reflect on how the higher education scenario would be if all universities were like this one.

The collaboration between a university and large companies is somehow common, but the collaboration with start-ups does not seem to be likely. Matti Hirsilä and Juha Saukkonen (JAMK University of Applied Sciences, Finland) show us how this is not only possible, but can also derive in multiple benefits for all parties. With universities embracing uncertainty and start-up embracing planning, students experience real-life action that increases their employability profile.

Additionally, in this issue Leo le Duc, Mirjam Leloux and Peter van Hoorn present the Amsterdam Science Park (ASP), a hub of prestigious education, high-quality research and knowledge-intensive business. It is home for eXchange Amsterdam, a collaboration between the knowledge transfer offices of five universities and academic medical centres in the city, which act as a central point to search for all their knowledge and technology.

We go all the way to South Africa, where Jacqueline Barnett tells UIIM the story of the first steps of the South African innovation ecosystem. Rated as a ‘work in progress’ and still with major gaps, like venture capital of critical mass of good quality research. The hope of a well-functioning ecosystem is in the actors that are already coming together and the new relationships that are flourishing.

Finally, we explore a scenario of a small emerging market economy, with 35% of youth unemployment, low level of business sophistication, common nepotism and an over-populated theory driven higher education system. This is the scenario where Tirana Business University emerged. Its president explains us how TBU found an innovative way to guarantee students’ employment through practical trainings (internships) and strong cooperation with over 50 business partners.

In the past two decades there has been a continued debate in the UK and elsewhere about the role of universities in driving economic growth and the role within that of collaboration between individual academics and non-academic organizations. In the UK there have been multiple reports and inquiries into these relationships, while international academic research publications into the nature of these relationships have proliferated. In their article, Perkmann et al (2012) reviewed the findings of this large body of research and noted the relative lack of large scale direct surveys of academic relationships covering all disciplines, types of universities and academics. They also noted the lack of comparable large scale longitudinal datasets which could be used to identify changes over time. In this article, I will report on the results of two national surveys in 2008/9 and 2015 which allow these shortcomings to be addressed in the context of the UK (Hughes and Kitson 2012, Hughes et.al. 2016, Lawson et.al 2016).

In 2009, the Centre for Business Research (CBR) at the University of Cambridge completed the first ever national survey of all academics at all UK universities in all disciplines explicitly designed to map the pattern of external relationships with public private and third sector organisations (Hughes and Kitson 2012), together with a national survey representing all industries (Hughes and Kitson 2013). Over 22,000 academics and 2,500 businesses responded. In 2015, a new survey was carried out by the original CBR project leaders, academics from Imperial College Business School and the School of Management of the University of Bath) (Hughes et al 2016) with the same coverage and achieved sample of over 18000 responses. This article reports on some of the key conclusions that emerge from this comparison. Both surveys covered a three-year period prior to the survey date, so the period which can be analysed spans 2005-2015.

These unique national surveys allowed a fuller and more robust picture to be drawn of external university links in the UK than had previously been possible. The findings challenged a number of critical views of those relationships, which had argued that UK universities lacked strong connections with the private sector and exhibited weak commercialisation activity. The explicit coverage of academic disciplines beyond science technology and engineering meant that, in addition to revealing substantial commercialisation activity, a much wider range of academic industry interactions emerged.

Main survey results in 2009
The first survey reported that around 7% of academics had been involved in patenting activity in the three years 2005-8. Additionally, over 3% had formed a spin out company, which meant that over 4000 new businesses had been formed by academics (mainly in the engineering and materials sciences and biology and chemistry fields). This is far higher than reported in public data based on aggregated reporting at university level; however, these commercialisation activities were not reported by academics as either, the most frequent or important of their connecting relationships with external organisations in any discipline. Instead a wide variety of other relationships were highlighted. These included activities designed to enhance links based upon people (such as student
placements, employee training, participation on advisory board membership and network membership), upon problem solving (such as contract research, consultancy, joint research and publications) and upon community development (such as public lecture and exhibitions and school projects). Moreover, academics regarded their relationships with external organisations as having positive effects on the nature and range of their research and on their teaching. Finally, relationships were constrained not by differences of culture or problems of establishing intellectual property contracts, but rather by constraints arising from pressures of time, the lack of resources or unmanaged or administrative capacity to manage relationships.

The parallel business survey produced very similar conclusions in terms of types of interactions and their importance in terms of constraints. It also revealed that interactions went far beyond the pursuit of technical knowledge for innovation purposes with academics in the science and engineering disciplines to encompass a wide range of business functions, from human relationship management through to finance marketing and logistics, which involved links for example with social sciences and mathematics. Since this picture of extensive and positive engagement emerged from these national surveys, public policy interest in university external relationships has continued unabated. Multiple reports of committees examined the constraints limiting these relationships and possible policies to improve or increase them and their impact and public funding for research has been structured to incentivise the pursuit of impact. Thus, the UK Research Councils have earmarked substantial funds to support academics pursuing impact focused relationships with external bodies. At the same time, the university funding bodies for England Scotland Wales and Northern Ireland have included an evaluation of impact case as part of the Research Excellence Framework, which evaluates university research performance and hence allocate funding body research allocations. What has happened to the pattern of university relationships with external organisations in the period since 2008/9 and which are the possible policy and research implications?

Comparisons over Time: Some Caveats

In comparing the responses of academics to questions about their external relationships, which are the result of a both a supply and demand effect, is essential to bear in mind the very different circumstances in which the external organisations are operating to avoid misleading results. While the first survey took place at the end of a period of sustained growth that culminated in the global financial crisis of 2008, the 2015 survey has been preceded by a period of sustained macro-economic contraction and public policy in the UK, and elsewhere, aimed at restoring financial stability through reductions in public sector expenditure, associated with substantial reductions in private sector R&D expenditures and in investment and the growth of output and with changes in corporate investment strategy to cope radically changing environments (Fillipetti and Archibugi 2011). Public funding for research has also fallen in real terms compensated to some extent by the ability of UK researchers to attract overseas funding especially from the EU.

Restrictions arising from access to finance in the constrained financial market circumstances following the global crash are likely to reduce the extent to which academics may either wish to be able to develop new start-up or spin out activities. Equally, the willingness of businesses to fund research which is less close to the market may also be constrained. Businesses may therefore switch their patterns of relationship away from research funding of a more basic kind towards problem-solving or contract based research. Finally, public and private sector retrenchment may well have led to a fall in the demand for consultancy services. These powerful demand-side effects may, notwithstanding increased policy support for impact-related activities, be associated with lower commercialisation activities.

In order to cope with the sample differences, a comparison between two samples of academics, one from each period, which are matched in terms of institution, academic seniority, age, gender and discipline was made. This produces a matched sample of over 10000 academics and provides robust representative results. Also, a panel of respondents was formed with individuals who responded to both the 2008/9 and 2015 surveys.
The results 2005-2015

Figure 1 provides an overview of the wide range of external interactions reported by academics in 2015 about the period 2012-2015, which confirm the results of the earlier survey. There is a very wide range of activity reported by UK academics, highlighting people based problem-solving and community-based activities. Their frequency far outweighs the more narrowly defined set of interactions associated with commercialisation.

Figures 2 and 3 use the matched sample data to compare changes over time. As might be expected in view of the changing economic context, Figure 2 shows how commercialisation activities fell, particularly consultancies. Even so, 6% of academics reported taking out a patent and 4% reported having licensed research outputs. Figure 3 reports on the incidence of all other engagement activities and shows a remarkable persistence over time.
time both in the relative frequency of different types of activity and in the frequency with which they occurred, with a small increase in community-based activities.

This picture of sustained engagement activities in the face of difficult background circumstances may reflect the increased incentives provided by policy for engagement activities. It also reflects the underlying importance attached to external engagement activities by academics. They seem to have a positive impact on teaching and on research. In relation to research, the bars in Figure 4 provide a clear picture of the frequency with which academics cite motivations and the importance they attach to these motivations connected with gaining insight into research, furthering their institutions outreach mission, keeping up-to-date with external research and testing practical applications.

A comparison of the patterns of motivation is shown in Figure 5. The stability in the pattern of motivation over time is clear. The frequency with which academics cite furthering their institutions outreach mission is worth noting, along with the decline in academics citing personal income as a motivating force. Over 70% of academics in both periods state that external activities have led to new contacts or new insights into their research and around 60% cite impacts related to improved reputation and the attraction of new research grants.
The panel dataset comparison shows some movement of individual academics out of engagement and that it is balanced by those entering into it (Lawson et al. 2016). However, this movement is relatively small compared to the persistence of engagement involvement by the core of academics. They maintain engagement activities over long periods of time, showing that external engagement is firmly rooted in academic practice across the UK university sector. Past engagement leads to future engagement in what is a learned experience. Equally persistent non-engagement suggests a degree of specialization within the academic community, with some academics more focussed on research per se than its potential or actual application. These findings have important implications for policy towards impact. First, supporting academics with existing engagement commitments may be a more fruitful way of raising impact than trying to increase engagement amongst “uninterested” academics, who nonetheless play a critical part in a diverse academic population. Deepening may be preferable to widening and the focus should be on quality not quantity. Second, the extent of commitment to and involvement in collaborative activities suggests that early exposure to engagement and its benefits in terms of teaching and research should be supported. This is difficult as long as the early stages of an academic career in the UK remain dominated by research and journal publication, which prevails in all universities over success in external engagement. It may be that the answer to this question is to be sought in more diversity across institutions, in their career and promotion trajectories and less emphasis one-size fits all research assessment and funding allocation process.

Alan Hughes | Professor of Innovation at Imperial College London

Alan Hughes is the Professor of Innovation at Imperial College London, the Margaret Thatcher Professor of Enterprise Studies (Emeritus) at the Cambridge Judge Business School and a Fellow of Sidney Sussex College. Until 2014 he was the Director of the Centre for Business Research (CBR) at the University of Cambridge and of the UK Innovation Research Centre (UK-IRC), a joint venture between Cambridge and Imperial College London. From 2000-2003 he was Co-Director of the National Competitiveness Network of the Cambridge-MIT Institute.

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References
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Business drives profession-oriented higher education in Vietnam

The concept of university-business cooperation in a communist country already takes some mental reframing. However, the fact that the Ministry of Education and Training in an emerging nation also launched one of the most comprehensive studies yet undertaken into the how the three actors of the triple helix cooperate is even more remarkable. The outcome of this evidence-based policy approach is set to become a leading example for governments globally looking to embrace the concept of the knowledge society. In this article, Siep Littooij (Saxion University of Applied Sciences), who has been working with Vietnam for over 20 years, explains this initiative.
With graduate employment rates currently at just 50%, Vietnam desperately needs to overcome the many problems currently affecting student employability. Business representatives, media and research articles alike cite recommendations from multilateral donor agencies that education must nurture “skills [which are] responsive to social needs and demands.”

**Student employability initiative**

In 2005, in an attempt to reform education and close the gap between universities and businesses, the Vietnamese Ministry of Education and Training launched the Profession Oriented Higher Education (POHE) project. POHE aimed to address challenges that graduates were facing as they entered the increasingly competitive labour market and to develop competency-based education in eight experimental programmes, spread over eight pilot universities. Regulating exposure between universities and business, the project promoted the participation of employers in curriculum design and student mobility to industry. Until now the results have been very effective, with the employer satisfaction level of graduates from these programmes being 80% (no prior data).

**Evidence-based policy approach**

In order to identify ways of facilitating and stimulating UBC through interventions in the policy framework at national and university level, the project launched three studies into UBC, which in combination were intended to provide an evidence base for better UBC policy-making. Each collected the views and concerns of one of three key societal stakeholders: business, government and higher education institutions. Borrowing from a European wide study and analytical model of UBC (www.ubcooperation.eu), the three studies paved the way for a unique and credible understanding of UBC in Vietnam. Its comprehensive analytical framework catalysed a large scale response rate, which resulted in the largest and most coherent study of UBC completed thus far in Vietnam, and one of the most comprehensive yet performed worldwide.

**The view from businesses**

While business representatives publicly lobby for better education, the interviewed companies hardly knew what happened in university education, or within universities at all. When it came to collaboration with universities, the perception of businesses was that it is difficult, without clear benefits and little stimulation. A growing level of UBC was reported at job fairs as a means of attracting the best graduates, whilst more intense collaboration was deemed possible for older, longer-established or larger
companies. Internships, field trips and guest speaking were examples of potential collaboration mentioned. It seemed that initial successes in UBC, often where a graduate stays in touch with the university, were the seeds for more intensity, diversity and success in later relations.

The novel role of the state
The importance of the state in the Vietnamese economy permeates deeply in policies and mind-set. The regulatory framework and coordinating role of the state in the economy is, therefore, very relevant to the UBC landscape, especially the role of the Ministry of Education and Training. In higher education legislation, it was noted that devolution of curriculum responsibility and university councils opened many possibilities for interaction. With very limited statistics available (i.e. a country-wide study on graduate employability), policy-making lacked evidence to build on. In the economic realm, the role of government as a third party, mediator and regulator is mostly invisible and needs to be clarified. The number of guiding policies is limited and, with some appropriate directions and regulations, they often are not fully implemented. Fiscal/financial incentives, research programmes, and mediating functions at central ministries were stated as neither supporting nor limiting UBC. Challenged by the modernising business landscape, dominated by emerging private sector employers, the state still needs to develop policies and instruments to play its role.

Perceptions of university management and teachers
Following a local adaptation of the European State of UBC study performed for the European Commission, 352 responses were collected from higher education institution managers and academics. Mobility of students to business was recognised as a leading form of cooperation and a means for improving skill levels and learning outcomes whilst also being good for the university’s public relations. Student-related interactions were found to be the most common form of cooperation, with an ever increasing recognition of this cooperation helping to achieve learning outcomes. The opinions of university managers and academics in Vietnam towards working with business, were found to differ especially in respect to barriers with HEI managers perceiving higher barriers to UBC. The positive side is that considerable drivers were found for the academics to maintain business ties although UBC is negatively affected by a lack of institutional incentives for academics and significant institutional barriers. As the project proceeds, all respondents claim to increase the number of interactions, which bodes well for the future.

Sustaining the voice of business
Whilst some positive signs of UBC in Vietnam have emerged, the study results show that there is considerable room for improvement of UBC. Although cooperation in education and management has recently started to develop, this growth is less prominent in research and knowledge transfer. These three studies bring evidence of the work that has been done to enhance UBC. The sheer presence of creating monitoring indicators through the studies has had the effect of bringing the topic into the spotlight. The studies have confirmed a high level of awareness of the beneficial impact business engagement has on curriculum development and internship models have on student learning. Applying a uniform analytical approach through these three studies, each focussed on one of the triple helix actors of government, business and university, has had the effect of raising credibility of UBC and the POHE projects which, in turn, supports recommendations for further relationship building between academics/universities and business.

With an analysis of business requirements now compulsory a-priori step in any curriculum revision, the Vietnamese Ministry of Education and Training has institutionalised UBC through quality assurance. Thanks to the recently delegated autonomy on curriculum design and degree awarding powers, these eight universities are able to sustain several programmes that bring students many more opportunities to acquire the skills they need to find and excel in their first job.

Siep Littooij | Manager at the International Projects Desk Saxion University of Applied Sciences
Siep is a member of the Saxion Research Strategy Programme where he is the linking pin between institutional, regional and European policy initiatives. He holds a master’s degree in Sociology and a bachelors degree in agriculture. He is personally interested in the knowledge flows and innovation that results from collaboration between the university and business. Leading a small team, he supports international activities, fund raising and grant applications by the Saxion Schools and Research centres. Saxion projects fund research and innovation, facilitate international mobility and support tailor made training or capacity building. As International co-director, he leads the Vietnamese Ministry of Education & Training project “Profession Oriented Higher Education (POHE)” phase 2, implemented with NUFFIC funding.

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The largest European study on University-Business Cooperation

Europe has just been hit by one of the biggest crisis ever known, which has intertwined economic, financial and social facets and seems too complex to have a single straightforward solution. At the same time, the economies of developing countries are rapidly growing and posing a threat to the already debilitated situation.
Europe has just been hit by one of the biggest crises ever known, which has intertwined economic, financial and social facets and seems too complex to have a single straightforward solution. At the same time, the economies of developing countries are rapidly growing and posing a threat to the already debilitated situation. In order to not only recover, but to become a true knowledge-society that can compete against fast-growing emerging economies, European governments must encourage innovation, entrepreneurship, new knowledge generation and exchange. Thus, Europe needs to find new ways of developing expertise and innovation within its knowledge producers, with more and better cooperation between the public and private sectors and higher education as one of its main pillars. Apart from the contribution to social challenges, university-business cooperation (UBC) can be beneficial for all organisations involved, helping them to overcome some organisational problems, such as decreasing public funding for universities or low levels of innovation in most businesses. While universities can improve the relevance and success of their teaching and research, businesses can access talent and the latest knowledge and technologies to innovate and remain competitive. The fact is that Europe is rich in both human capital and technological capabilities, has boast of having a world-class scientific capability, a large number of the world’s leading universities and many highly competitive international companies. However, it is losing ground in the technology industries that are reshaping the world’s economy, and is lagging behind the US in its knowledge transfer abilities. This means that even when UBC can act as an engine to remain competitive through ‘smart, sustainable and inclusive growth’ (as established in the strategy Europe 2020) while helping to address organisational problems, the majority of European universities and European businesses are not changing fast enough to pick up this trend. The first step is to understand why UBC does not occur more often. The answer probably lies in a combination of the lack of contacts in other organisations, the lack of awareness of what the other partner can offer, the lack of clear procedures and effective support, the lack of incentives to collaborate, the competing responsibilities and lack of time, the different goals, the excess of bureaucracy, the lack of mutual trust, commitment and understanding, the different organisational characteristics and the outstanding difficulty to change cultures. This leads us to other questions: how can these barriers be identified, addressed and eventually overcome for organisations to engage and benefit from the results of this cooperation? Which are the reasons why organisations engage in UBC? And as a result, which the main challenges and opportunities?

To address these questions, in mid-2015, the European Commission DG Education and Culture, commissioned a study that looked into the state of university-business cooperation in Europe. Following an evidence-based policy approach, this study focuses on the European UBC drivers, barriers and opportunities, in order to implement the most suited policy mix. In January 2016, an experienced consortium started this challenging task and based on a broad literature review, expert interviews, two major quantitative surveys and 50 good practice case studies are being developed underpinned by the UBC Ecosystem framework™. This consortium is led by the Science to Business Marketing Research Centre (Muenster University of Applied Sciences) and includes Technopolis Group UK, UIIN, University of Ljubliana, Ingenio (Polytechnic University of Valencia - CSIC), Eurasishe and Eurochambers, as well as the support of 33 country partners. Together, they will gain an up to date, comprehensive and deeper understanding of UBC from the HEI and business perspectives to shape the future of UBC through the development of evidence-based recommendations for policy and practice.
The University of Twente is a research university in the eastern Netherlands with approximately 9600 students. Since the 1980s - a time when business and science were not used in the same sentence - the University of Twente has focussed on its relationship with the business community. As such it was the first university to forge a link with business - a revolutionary choice back then which still proves exemplary today.

In December of 2015, Elsevier/Scienceworks ranked the University of Twente number 1 in the national “Valorization Ranking” as overall best performing University and awarded it the title of “Most Entrepreneurial University” of the Netherlands for its economic impact. The research rated all 13 Dutch universities and ranked them on valorization, entrepreneurship and communication. The University of Twente scored best overall for valorization and had the best profile when it came to entrepreneurship. Twente has the highest number of spin-off companies and houses the highest number of companies - 400 - in its science park.

**Smart partnerships**

How did we get here? Our approach is about vision, smart and strategic partnerships, and a program to enable the organization. It is about empowering the right people. We have teamed up with governments, industry, and the University of Applied Sciences. Our innovations are increasingly being brought to the market through collaborations between companies, research establishments, and universities with each party bringing its unique value, capabilities and advantages to reach the mutual goals. The University of Twente invests in supporting excellent research, educating talent, and stimulating an entrepreneurial culture that fosters new start-ups. We foster a true cooperation that goes much further than a contract; it is a team on a shared mission.

We also specifically chose to create a university-wide, strategic business development program aimed at enhancing the relations with the business community to help the university, its departments, and industry achieve their goals and develop attractive instruments to create value for and with the industry. Creating smart teams is the basis of our approach, both internally and with strategic external partners.
Industrial innovation
Below we highlight three programs that are typical of the varied approaches Twente takes in industrial partnerships.

Science2Design4Society at the DesignLab: DesignLab is a creative, cross-disciplinary ecosystem at the University of Twente that connects science and society through design. Faculty and students from all fields work together with companies and governments on the societal design challenges of our times, inspired by novel scientific insights. Top talents from engineering, natural science, social science, and the humanities join forces to take on the critical problems of tomorrow’s world, using their creativity to bring science to design for society. DesignLab’s aim is not only to develop ground-breaking products and applications. It is also to train a new generation of designers who will combine profound scientific knowledge with creative design skills, an entrepreneurial attitude, and the ability to anticipate the social dimensions of new technologies.

Impuls PhD program: The university-wide Impuls PhD program allows an industrial partner to invest in research in the form of a four year PhD project. By combining governmental subsidies and university funds, the University of Twente is able to match that industrial PhD with a second PhD project. So far, we have done two very successful calls for this instrument and a third is in process.

PDEng program: The University of Twente and the Stan Ackermans Institute launched the postdoctoral engineering program, PDEng. In this two-year program, the trainee will create a design solution for a technical problem from the industry, while still following classes to get access to the most recent science and knowledge. The candidate can either be a graduate with a master’s degree doing the project for an industrial partner, or an employee from a company. This flexible instrument is much appreciated by the industry.

These are some examples of good instruments that work through partnerships with the industry. But we continue to seek new ways to create value with our industrial partners. In short, we are developing additional instruments that enable industrial partners to tap into the talent educated at our university (e.g. scholarships for technical master students for SMEs) and specific instruments tailored to the needs of SMEs. The next step involves creating value in a broader sense.

Janinka Feenstra | Project Manager Strategic Business Development
Janinka Feenstra is a pragmatic professional at her best in a high performance, entrepreneurial environment where A+ teams constantly learn with and from each other. She currently is a Project Manager in Strategic Business Development at the University of Twente. Janinka is convinced: “Every accomplishment starts with the decision to try”. Exploring new opportunities is part of her passion. She is not afraid of going the extra mile, and with a strong sense of purpose Janinka knows how to set a strong vision and turn it into practice. Janinka has extensive experience in complex organizations.

Janinka gets excited about innovation and entrepreneurship, business development and marketing communications in an international environment.

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Start-up companies versus employability of students

CAN UNIVERSITIES CONNECT THE DOTS?

Throughout Europe, and the world, the message has been heard loud and clear: the most important vehicle of new employment is the cohort of young, small companies aspiring to growth. The Finnish economy, as an example, reveals this dynamic well. Between 2001 and 2013, micro-sized companies (employing less than ten people) created a total of 52,000 new net jobs. During the same period, the net number of jobs in large 250+ employee companies, went down by 16,000 jobs.

The statistics presented above should not, however, be misinterpreted. Every economy needs flagship companies of a critical size to operate and succeed globally. These companies, however, seem to have reached a stage in their development, where success is sought by streamlining, focusing and outsourcing. At best, mature companies and resource-constrained new ventures can bring value to each other; established companies can be key customers and value chain partners to agile startups. The booming start-up phenomenon does not only reflect societal and economic evolution, but seems to fit well with the values and objectives of the Y-and G-generations entering the world of work.

An obvious question is: Is the collaboration of universities and their students with start-up companies a natural part of general university-industry interaction, or is there something specific to be taken into account when planning and implementing cooperation?

We believe the same recipes that work in traditional university settings and within the process of working with established companies, do not give optimum results when applied in new contexts. It is interesting to look at the poll results of the 2014 “Business Education Jam”, a worldwide online gathering of thousands of business educators and practitioners. The majority of participants agreed with the statement “a degree is not valid proof of skill in 2024” and, more shockingly, a mere 6% strongly agreed that “our current graduates have the skills to succeed in today’s jobs”. What about tomorrow’s jobs, that are increasingly created by start-up companies? If we want to make our students employable to new companies in the new world, we need to reinvent ourselves.

Quoting some of the most prolific writers on start-ups, Steve Blank and Eric Ries, one can summarise the characteristics of start-up companies as follows:

- A start-up organisation is of a temporary nature
- It aims to create new services, products or ways of doing business – or all of them
- It is more of a search than detailed planning
- The single most important factor is the utmost uncertainty
- The clock speed of development of the companies and industries in which they operate outpaces traditional companies and industries

Compare that with established industries and companies with their specialised R&D functions, ready-cut roadmaps for the next five years, resources and job functions responsible for interaction with universities.

From a university perspective, one can see many reasons to prove that start-ups would welcome universities as partners:

- Start-ups operate with resource constraints – if we can bring in hands and brains that are relevant to the company, the real-life effect of universities can be crucially positive
- Since start-ups are in ‘search mode’, their assignments are of an open nature, giving students and faculty wider learning opportunities than clearly defined tasks
- For start-ups, growth means wide and rapid internationalisation. In many cases universities with their multicultural student body, faculty and partner network can act as the conduits in accessing new markets for these companies.
What are the university characteristics that might be off-putting to start-ups?

- Universities still like to organise their activities into semesters, and courses. A period of 3 months in an academic institution is a blink, whereas in a start-up it is a lifetime! How can we then make our clock speeds match?
- Universities are more at ease when things are happening inside a faculty, school and programme. The life of a start-up is filled with interdisciplinary challenges. How can issues be approached widely across disciplines?

In fast-changing environments, start-up companies can reduce uncertainty by identifying upcoming change drivers and preparing for them. In other words, moving between scanning and planning horizons. The first implementations of this kind of university-aided anticipation process (engaging students as co-researchers) are taking place in the local start-up ecosystem in Jyväskylä, Finland. Our experience portfolio of university-start up “industry” collaboration includes the following co-learning settings implemented over the last ten years:

High Tech Management: A full semester undergraduate specialisation programme (of 25 ECTS credits), where one module consists of project work in multicultural teams assigned by tech-based start-up companies

Supercoach® Entrepreneurial Training (SET): An intensive eight-week development program for first-time technology and knowledge-based entrepreneurs. Students are placed into start-up teams as assistant coaches, preparing to weekly coaching sessions in tight collaboration with entrepreneurs (that are often of other than business background)

Multicultural Business Project. As a part of a larger PROCEED-project, the first implementation in February-April brought together nine SMEs looking for internationalisation and 40 students across two universities and multiple faculties and domains. Since many of the above-listed activities are experimental and unique, we have tried to approach, with a critical and analytical eye, the value of these activities to all stakeholders – companies, students and faculty. Based on the measured results, (available from the authors of this article and also presented in the UIIN Conference Berlin 2015 and in the Finnish Business Review - www.fbr.fi) our lessons learned reveal that: Students value learning experience based on real-life action higher than traditional courses, reporting improved skills in various subject areas and in transferable skills. Entrepreneurs and students can learn together: the self-efficacy reported by participants in co-learning settings goes up significantly even with short-term (but intensive) programmes.

The relationship between the university and companies has continued and evolved – from initial projects and programmes to thesis, work, continuation projects.

The relationship between companies and students has continued and evolved – leading to thesis assignments, internships and even employment or co-entrepreneurship.

Faculty members have been able to stay up-to-date of the development of industries by collaborating with these companies with fast evolution and position in the forefront of industrial change.

It seems obvious that the question “Should start-ups and universities cooperate?” is invalid; we need only to focus on how to do it. Our credibility and relevance to our students and society requires that. It needs a new learning-by-doing mindset and a higher tolerance of failure - all attempts will not be homeruns. In the world of work and operating environment, the only certainty is increasing uncertainty. Let us embrace it, just like the start-up companies already do.

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Amsterdam Science Park: A Novel Technology Transfer Approach

INTRODUCTION
Amsterdam Science Park (ASP) represents the highest concentration of publicly funded research in the Netherlands and is home to one of the largest concentrations of beta-based sciences in Europe. This unique juncture of prestigious education, high-quality research and knowledge-intensive business has been carefully cultivated over the years to stimulate innovation and collaboration. The triple helix collaboration exists between the city of Amsterdam, the University of Amsterdam and dozens of renowned research institutes and some 120 companies, from start-ups to multinationals. Each of these working in fields (including ICT, life sciences, advanced technology, energy and sustainability), collectively form a vibrant eco-system where business, science, education and innovation meet. The challenge in its genesis has been to strengthen and align mutual and cross-network connectivity between stakeholders in order to maximize impact as a technology transfer ecosystem.

Amsterdam Science Park is also host to Innovation eXchange Amsterdam (www.ixa.nl), a collaboration between the Knowledge Transfer Offices of five universities and academic medical centres in Amsterdam (i.e. University of Amsterdam, University of Applied Science of Amsterdam, Vrije Universiteit of Amsterdam, Academic Medical Centre of the University of Amsterdam, Vrije Universiteit Medical Centre), aiming at initiating public-private research collaborations, making research results available for innovation and societal impact and stimulating entrepreneurship. IXA provides one central point of contact for both scientist and external public and private stakeholders, sharing knowledge, experience and expertise (business development teams, lawyers), organising workshops and match-making events for scientist and companies and promoting spin-off generation by, for example, offering business planning support and financial instruments for starters (Proof-of-Concept fund; pre-seed fund). Related to these activities, IXA has also strong ties to the Amsterdam Centre of Entrepreneurship (ACE) and its Venture Lab, organising pitch trainings, boot camps, offices, access to facilities, mentoring support and seed money (e.g. subsidies/grants and venture capital) for startups at the Amsterdam Science Park.
STRATEGY AND ACTIVITIES UNDERTAKEN

The Amsterdam ecosystem is being developed along several strategic lines. First, the organisation of ASP consists of a separate management governed by key stakeholders such as IXA and ACE-Venture Lab, through five focused programs: Acquisition and Retention, Valorization and Entrepreneurship, Corporate Communication and Marketing, Functions and Facilities and Internal and External relations. Within these programmes, networking events, matchmaking events and entrepreneurial activities are developed at ASP. Furthermore, a new communication programme, “Connecting Boundless Minds” is being launched, which aims to put people in the spotlight as the central partners in the science park. Crucially, novel activities to forge and organise collaborations between companies and high tech research occurs in Innovation Labs under development by IXA. The scale-up of start-up companies and spin-offs from the university and other research institutes are being fostered through novel acceleration programmes being developed within the Venture Lab. Finally, the integration of entrepreneurship education within the Venture Lab start-up ecosystem at ASP, leads to improved dynamics and new job opportunities for talented young entrepreneurial professionals. These new activities are carried out with strong support from Amsterdam Municipality. In each of these activities, data acquisition, analytics and metrics are being developed to be able to evaluate the measures taken.

OUTCOMES

The new practice being developed will lead to the progression towards a more integrated knowledge transfer and startup ecosystem in beta science and high tech in Amsterdam. Knowledge and expertise from research institutes and the University of Amsterdam/ Vrije Universiteit of Amsterdam will develop into more practical applications and entrepreneurship and regional employment will be boosted. Some figures underpinning our ambitions are presented in the table.

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<th>2014</th>
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<td>4,800</td>
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Mirjam Leloux  | Director of IXA office UvA-HvA
Mirjam Leloux got her PhD in Pharmacy at RU Utrecht. She joined industrial, public and private research organisations to develop technology transfer, business development and management expertise. She was acting as an independent consultant in technology transfer for universities and private inventors during 10 years. She regularly publishes on technology transfer and teaches in entrepreneurship.
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Peter van Hoorn co-founded Bio-Intermediair, a Biotech start-up in the early 1980’s. He subsequently held director positions in Business Development at Gist-brocades and DSM in Europe and the US. In 1995, Peter headed up North American business development for DSM Biologics and was President of Cambrex’s Biopharmaceutical division (2002-2008).
Peter lectures at VU, regularly presents at conferences and is active in a variety of advisory roles, including member of the advisory board of Chemistry incubator ICLA (Matrix VI) at Amsterdam Science Park and the Green Metropole initiative in Amsterdam.
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The Innovation Ecosystem in South Africa: work in progress

Some interesting initiatives are emerging in South Africa. Although today they are isolated, they expect to be the seeds of a future well-connected national innovation ecosystem.

South Africa has made great strides over the last decade in developing a national system of innovation – partly due to a supportive and driven Ministry of Science and Technology, and partly due to the increasing awareness by universities that their mandate goes beyond teaching and research. Most of the leading universities have established an innovation or technology transfer office as they realise that they can, and must, make a contribution to society and the broader economic environment. Legislation that obliges recipients of public research funds to identify, protect, manage and commercialise that research has also provided an impetus for these activities at publicly funded institutions, and support has been provided to universities to develop appropriate skills and capacity to do this.

Yet, there are major gaps in the national system of innovation – the private sector is conspicuously absent, there are no early stage venture capital players, there are too few skilled people, too few areas with a critical mass of high quality research, and there are limited areas with appropriate startup infrastructure and support systems. In other words, South Africa’s innovation ecosystem – one that has the appropriate people, skills, support structures and companies to drive innovation projects to the market – still has major challenges.

However, even with all these challenges, South Africa’s innovation ecosystem has come a long way in a fairly short time. Particularly in the Western Cape (around Cape Town) and in Gauteng (around the Johannesburg/Pretoria metropolis), there are definite signs of improvement. In other words, South Africa’s innovation ecosystem – one that has the appropriate people, skills, support structures and companies to drive innovation projects to the market – still has major challenges.

In only a few short years, Cape Town has become the hub of startup activity in South Africa and a recent survey showed that 59% of South African startups are based in the Western Cape. One of the major spurs has been the “Silicon Cape Initiative”, a non-profit, community owned and driven movement of technology entrepreneurs, developers, creatives, angel investors, and funders that aims to improve the environment to create more and better startups. “Accelerate Cape Town”, a forum for corporate business to connect and catalyse action for growing economic success, also has an innovation programme targeted at collaborating with universities, blurring the lines between the major players. A critical mass of startup companies in specific industries has been established in the area, which has attracted more entrepreneurs from outside the area as well as investors. Business incubators and service providers have also been established and grown rapidly. Universities are also starting to develop incubators to support both their own spinout companies and to provide support to entrepreneurial students and staff within their institution and beyond – for example, Stellenbosch University’s LaunchLab that is expanding its reach to other Western Cape universities.

Even in less developed regions, the seeds of an innovation ecosystem are being developed. The Regional Innovation Forum was launched in Port Elizabeth in 2011 and has grown to include 17 local organisations from government, industry and academia. Port Elizabeth is in the Nelson Mandela Metropole in the Eastern Cape, one of the poorest provinces with an official unemployment rate of 30%, and an expanded unemployment rate (including those no longer looking for work) of 45%. The area around Port Elizabeth is an automobile manufacturing hub, but this activity has declined in recent years, leaving a gap for the development of new companies in innovative manufacturing and, especially, renewable energy. The seeds planted by the Regional Innovation Forum have led to the creation of a university-based innovation incubator, Nelson Mandela Metropolitan University’s Propella. Launched in 2015, 18 companies are already being incubated in areas related to manufacturing, energy and ICT. Supported by government and private sector companies, Propella is rapidly becoming the hub of the local innovation ecosystem.

There are more examples of areas driving the innovation conversation across South Africa – from South Africa’s first science park, The Innovation Hub, in Pretoria, to Durban’s “Innovate Durban” initiative.
South Africa’s innovation ecosystem is certainly “in progress” and there are hopefully signs that, even in less developed regions, the importance of promoting and supporting innovation is seen as critical for progress.

One major stumbling block, even in areas such as the Western Cape, is access to early seed funding for research-supported high technology ventures. From 2008 to 2012, only 4% of venture capital funding was made in projects of this nature despite world-class investment opportunities arising from entrepreneurs, universities and research councils. The only source of funding has been from government, but this was not large enough or sustainable, and there were limitations in providing the management support required. Therefore, while research institutions have made major strides in their ability to manage and drive innovation projects into the market, the absence of seed capital to move opportunities from the laboratory to a private equity investor remains a key weakness in the innovation ecosystem.

South Africa has many challenges but, working together, the main role players are starting to develop an innovation ecosystem through many disparate initiatives that add value to the whole. Even the government, with competing priorities in poverty alleviation, health and education, has prioritised innovation as the way to growth and development. There are still major stumbling blocks: the development of more businesses that can absorb new technologies, access to sources of funding to support new businesses, and finding entrepreneurs that can turn these businesses into global enterprises. However, there are many examples of innovative businesses that have flourished in spite of the lack of an ecosystem – now it is time for South Africa to make it easier for more to develop, survive and grow.

Jaci holds a Master’s degree in Chemical Engineering from the University of Natal, Durban, South Africa and an MBA (cum laude) from the University of Pretoria. Jaci started her career in the private sector before moving onto a contract research organisation and then to the wholly-owned commercialisation company of the University of the Witwatersrand, Johannesburg. In 2007, she established the Innovation Office at Nelson Mandela Metropolitan University in Port Elizabeth where she is currently the Director. Jaci is the chair of the Regional Innovation Forum and of the Board of Propella, the NMMU’s innovation incubator.
The Albanian context and the TBU strategy

Since the time of TBU's foundation, the overall context of university-business cooperation has been rather intricate, due to country specifics and inherent set of circumstances. On the one hand, Albania features a small emerging market economy, with a total population of 2.8 million inhabitants and a GDP of €10 billion. Family-owned businesses and micro enterprises prevail over a very small number of mid and large corporations; business sophistication and innovation levels are rather shallow across the board. Unemployment level is at 17%, whereas youth unemployment is at 35%. Nepotism, political connections, and bribery are key driving factors to employment and career growth. Merit-based employment and carrier growth typically occur in large corporations.

On the other hand, the Albanian higher education system is dominated by large public universities, which are theory-driven, over-populated, ill-financed, highly bureaucratic and inundanted with under-motivated staff. In 2004, private universities entered the scene with a clear objective of gaining market share, set on attracting high numbers of students and maximising revenues. During this last decade, higher education in Albania underwent a rapid massivisation, yet at no proportional investment growth. On an annual basis, the number of university graduates exceeds the number of job vacancies available in the labor market by two or three-fold.

Under such multifaceted and perplexing conditions, university-business cooperation faces objective and subjective impediments: business owners have little or no confidence in the quality preparation of university graduates, while the absence of fair competition, merit-based employment and career growth opportunities discourage young people to the point that they forego quality knowledge and skills for a mere degree.

Considering the unfavorable set of circumstances, TBU relies on three strategic pillars: a small motivated student body, a not-for profit approach that aims for financial sustainability and self-sufficiency and high quality education. Regarding the quality education, this includes theoretical learning and practical training. All Bachelor programmes include up to 42 weeks of practical training throughout a 3-year span, while Master’s programs include up to 24 weeks of practical training, which are mentored, monitored and assessed by key business staff members in close collaboration with TBU staff. TBU faculty members are mainly business and law practitioners, who share real-time information and market experiences with TBU students.

PRELIMINARY RESULTS AND SUCCESS STORIES

TBU is regarded as a credible higher education institution that guarantees its students’ employment, with results...
showing how the great majority of TBU graduates have been employed, with some of them already growing to leadership roles. This has been done through practical trainings (internships) and through strong cooperation with over 50 business partners, including banks, corporations, law and financial consulting firms. Some of these include:

- **TBU- Balfin Group.** The Balfin Group is not simply one of TBU shareholders, it is a wholesome partner. Over the past 18 months, the Group has financed €200,000 in TBU; hosted 28 interns; employed seven TBU students on a full-time basis; provided temporary jobs for 73 students; paid TBU tuition fees for 21 Balfin staff members; welcomed TBU students’ applications intended for their special initiative trust fund, ‘Tell me your idea’; engaged two senior members as teaching faculty; engaged four key Balfin members into leading thematic seminars for TBU students; organised several of its staff trainings at TBU premises, while collaborating with TBU staff.

- **TBU - Raiffeisen Bank:** This is the largest commercial bank in Albania that, for five consecutive years, has sponsored the TBU National Competition for senior high school students ‘Entrepreneurs of the future’, with a total fund of €36,000. During the period July 2015-March 2016, the bank has recruited 14 TBU students on its 6-12 months internship program, five of which have been already hired by the bank on a full-time basis. The bank is considering hiring three additional TBU students.

- **TBU - HM&H Law Firm.** Established in 2004 by three young lawyers, this firm is now one of the most prominent law firms in Albania. All of the three partners teach at TBU. Every year, the firm recruits 1-2 TBU law students as interns. The firm also offers financial and technical support to the annual TBU National Competition for high school student ‘lawyers of the future’.

- **TBU - A. Zeqo Accounting Firm.** In November 2015, this firm recruited two TBU interns in their third year of the BA Business Administration programme, minoring in Finance. After three months, the firm hired one of the interns, whilst the other intern was hired by a business client to the firm.

**SOCIAL IMPACT AND VISION**

TBU’s accomplishments and proven track record have restored business partners’ confidence in quality education and students’ preparation and have an augmented interest in instigating long-term partnerships with TBU. Increasingly, students and their parents acknowledge TBU’s market-oriented philosophy, take value in TBU’s effective model as a small-size university with high dedication and individual care shown to its students, and appreciate the significant role of TBU’s practical training programme in guaranteeing successful employment.

All considered, TBU is triggering a cultural change, contributing to a positive social impact, transforming perceptions about higher education quality, restoring the value of merit-based university degrees, and reinstating the role of meaningful and purposeful education that is results-driven – a quality education that leads to employment and career growth.

To that end, TBU’s motto proudly states: “At TBU, you don’t simply earn a degree, you start your career.”

Ultimately, in the next ten years, TBU seeks to consolidate further in order to provide quality education to Albanian and foreign students from the Western Balkans in partnerships with quality European universities that are similar in nature, very market-oriented and practical-training-driven. TBU is open to acquiring best practices and sharing its own lessons learnt with others, and is steering forward with a clear vision, albeit prudently, to taking the right steps toward a bright and successful future.