REGION IN FOCUS

ENTREPRENEURIAL LATIN AMERICA

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MESSAGE FROM THE EDITOR

Entrepreneurship and Innovation in Latin America

As we move to knowledge-based societies, the topic of university-industry relations continues to grow in popularity and awareness with government, business and universities alike across the globe. With greater cooperation between two of the three triple helix stakeholders crucial to innovation and human capital supply chains, emerging regions are especially interested in developing these relationships as a means for fast-tracking growth, and Latin America is no exception.

In this issue, we shine a light on Latin America and some of the initiatives being undertaken in this part of the world, acquiring evidence of initiatives in different Latin American countries. Far from being ‘developing’ in their approach to university-industry relations, there are some highly innovative approaches being undertaken in this region which provide some interesting insights for us all.

Firstly, Francisco Marmolejo, the Coordinator of Higher Education in the World Bank and lead expert in Latin American Higher Education describes the importance of innovation from the perspective of one of the most important institutions on the planet, with focus on Latin America.

Representing the business sector, Ana Segurado, the Director of Telefonica Open Future, describes some of her company’s initiatives in Latin America and how Telefonica is seeking to support the whole entrepreneurship process and ecosystem in this region and from a governmental perspective.

The voice of the HEIs is heard from Celso Garrido, professor in the Universidad Autónoma Metropolitana in Mexico, coordinator of the network UE-ALCUE and expert in university-industry relations shares some insights about the current situation of Latin American HEIs and their relationships with industry.

Juan Camilo Quintero, director of Ruta N in Medellin (Colombia), shares with us the fascinating story that has transformed what used to be the dangerous city in the world in one of the most innovative ones, having the collaboration of the triple helix as the base for its development. He is a facilitator that articulate the innovation system and completes the UIIM 360° view of the Latin American region.

A summary of the ‘must-knows’ from the second CELAC-EU academic summit is also featured. Held in Brussels, it aimed to bring together the European and Latin American regions in terms of higher education, science, technology and innovation.

However, this issue is not solely focussed on Latin America, with a number of other initiatives being described from around Europe.

A true ‘academic entrepreneur superhero’, Manuel Perez Alonso, professor of genetics in University of Valencia (Spain), describes his migration from the university lab to the foundation and management of eleven biomedical companies, his motivations, drawbacks and key success factor.

Toni Pienonen and Mikko Markkanen from the consulting Business Arena (Finland) and Rika Ahmaniemi from JAMK University of Applied Sciences (Finland) describe their regions’ evidence-based approach to innovation policy as they look very closely at the development and influencing factors in the university-industry axis in central Finland.

In our last article, Robert Tijssen and Alfredo Yegros, from the Centre for Science and Technology Studies in Leiden University (The Netherlands) describe the importance, power and utility of the University-Industry Research Connection, in which they monitor and assess the university-industry relations making use of data-mining.

The variety of the articles represent the diversity of people and organisations that in different ways are pushing the boundaries toward more innovative and entrepreneurial societies. We trust you enjoy the Latin-American focus of this UIIM edition, perhaps with a nice Colombian coffee to accompany it!
The World Bank has been active since 1963 in supporting the growth and diversification of tertiary education systems in developing countries and in promoting essential policy reforms to make the sector more efficient, relevant, equitable, transparent, and responsive. Currently, it is also working towards increasing the social and economic impact of higher education in their communities. UIIM Editor in Chief invited Francisco Marmolejo, the Tertiary Education Coordinator of the World Bank, to share his opinion about innovation in Latin America.

**INNOVATION AS A KEY TO LATIN AMERICAN DEVELOPMENT**

INTerviewer: Victoria Galan Muros  
IntervIee: Francisco Marmolejo

VGM: A World Bank report I was reviewing made a call for greater innovation in Latin America as a path to greater development. Relative to higher education institutions (HEIs), what type of innovation would you personally like to see in Latin American HEIs?

“I think there are various angles of innovation that I would like to be more visible in Latin America. One of them has to do with the strongest tool available at the HEI, that is, the curriculum. I think there is a lot to be done in this domain in Latin America.

On one hand, I generally feel that the curriculum of HEI and the academic degrees offered by the HEI feature several elements that are against proactive tendencies in an international context. It is a very rigid curriculum, highly professionalizing and extremely inefficient, with few side opportunities. All this gives a relatively limited ability to HEI to respond in an anticipating manner to the needs of the economy and society of the next years. The need for innovation in higher education is a great element to be solved.

The second one is related to HEI's management. In recognition of the important history of higher education in Latin America it is equally important to recognize that it is necessary to adopt governance systems in higher education that enable a more efficient management of the HEIs, and to be more focused on the expected results.

The third element is related to the innovation agenda itself, how to assure innovation in HEIs with their links with the government, society and the employing domain. Obviously, there is a long way to achieve that.”
VGM: To the best of your knowledge, is there something being done in respect to the existing gap between the skills acquired by students during higher education and those in demand in the markets or what is it that Latin American HEIs can do to minimize this gap?

“Unfortunately the HEIs are not doing that much and generally it is done reactively instead of proactively. It is crucial to emphasize that it is not a matter of blaming the lack of skills of graduates only on the HEIs, instead there are also other stakeholders that are involved in this matter that also do not make any systematical and serious effort, this includes the employers.

There is also a lot of work that can be done by the employers: For instance, knowing, understanding and presenting on a periodical basis to the HEIs not only about what they need now, but also what they will need in the next years.

On the other hand, they could also open up their space in a more proactive way so that the HEIs’ students and teachers can acquire a practical component as part of the training. The HEIs have a lot of work to be done to incorporate these perspectives, and that of the employers.

Furthermore, not all of those who study at HEIs are necessarily looking for employment, so they need to make sure that there is an added entrepreneurship component that enables the creation of employment.

Finally, HEIs can make more systematical surveys of graduates in order to know about the difference between what they are learning and what they are supposed to be working as. I don’t think that differences are a negative aspect but the ideal future HEI is one that prepares the students for the scenario that most probably the profession they have been trained for will probably not be what they will be working as. So obviously there must be this flexibility to understand what opportunities will graduate students have and it is important to follow up to know what happened, so that this information is used adequately in order to reconsider the academic curriculum.”

VGM: In respect to research developed in HEIs, it is often only found in scientific papers; however, productive knowledge transfer requires establishing partnerships with governments or industries. What is the position of the World Bank in regards to their technological and knowledge transfer and its application in society and what is expected from how should HEIs act?

“I think it is a new point of view, that research can be a shared activity. There is a lot of work that HEIs should carry out, but they cannot do it alone. It is an effort where adequate links with the entrepreneurial sector and industry are needed. Also the government has to contribute with policies for academics that are not a barrier between this approach and link.

However, it is necessary to have the financial stimuli needed for this kind of link. Unfortunately, in this respect, the Latin American region has a lot of work to be done. When looking at compared data of the research investment in the region compared with other ones in the world, there is a significant difference.

On the one hand, there is a tendency to publish, which is good, but on the other hand, there is a limited effort in innovation in the development of patents. Moreover, the institutional and legal regulations revolving around the HEIs can, on various occasions, prevent this from happening.

Sometimes the industry also resists considering cooperation with HEIs it as a productive gain for everyone. I have encountered in many countries business people asking why they should contribute to it if they were already paying taxes to support HEIs and questioning the benefit that they get from HEIs. There is indeed a lot of work still to be done, but some recent initiatives are already pointing out the right way.”

Francisco Marmolejo
Coordinator of Tertiary Education | World Bank

Francisco Marmolejo is the Coordinator of Tertiary Education at the World Bank. With a successful career in Mexican higher education (USLP, UDLA), he was appointed as founding Executive Director of the Consortium for North American Higher Education Collaboration (CONAHEC). He has consulted for universities and governments in different parts of the world, and has been part of OECD and World Bank international peer review teams of experts and is member of advisory and governing boards in various institutions and organizations. Marmolejo is a worldwide recognised expert on internationalization of higher education and higher education trends.
Telefónica has a unique perspective about developing Latin American entrepreneurial talent and businesses. Having launched a series of initiatives aimed at motivating and supporting the next generation of entrepreneurs in Latin America, Telefónica has proven their commitment to the cause and to the development of the Latin America’s future enterprise. Ana Segurado, Director of Telefonica Open Future, shares some insights with the UIIM readers.

**ACTIVATING THE ENTREPRENEURIAL SPIRIT IN LATIN AMERICA**

INTERVIEWER: Victoria Galan Muros                     INTERVIEWEE: Ana Segurado

The Telefónica group, a Spanish communication multinational, has spawned many initiatives in Latin America that are directly targeting the stimulation of entrepreneurship, and in doing so, are taking a leading role in developing Latin American entrepreneurs. Their initiatives have been dedicated to the creation of entrepreneurial ecosystems and to engender the entrepreneurial spirit in young people so that they have the motivation and courage to begin as entrepreneurs. The initiatives include Think Big, Wayra, and a scholarship program targeting technical university students called Talentum, all under the umbrella of Telefónica Open Future.

When asked for the role of multinational companies within Latin America’s innovation ecosystems, Ana Segurado believes that corporations should play a role in community development, whilst accessing future income opportunities and says: “They have a critical and very important role due to all those B2B projects, which have developed products and services for other companies and not for a final consumer. I think that big multinational companies are surely a business opportunity for local companies.”

Particularly for Telefónica, she admitted: “We are committed to open up our company to innovative products and services coming from companies that are starting, which undoubtedly have a great innovative component. I think we have the responsibility for the promotion of these ecosystems to provide business opportunities for these companies, not only with ourselves but also with our clients, that is, take these startups closer to our clients.”

One of the major challenges at Telefónica is to avoid the talent escape Latin America to more developed regions, as a result of a lack of investment in financial resources in the local market. “I believe we have to assume our responsibility in funding these projects in order to keep the talents inside Latin America and make Latin American innovations develop, so that the talent inside this region can develop internally and does not need to look for outer funding for their projects. Telefónica supports entrepreneurship in Latin America with the view that it is a large growing market, but one that lacks development to mature its industries and develop its economies. As has been observed by Telefónica, the best way to help countries is to support entrepreneurship and technological innovation, because these are the propellers of growth in these countries.”
“One can help in the initial stages of a project or a company, but later on, if there is no funding that enables these companies’ development, the projects leave their countries of origin. I think the challenge for all of us who are in these markets, is to make talents develop inside their local environments and grow and internationalize from the local environment”, adds Ana. Telefónica, as one company operating in this country, also benefits of this growth indirectly. “That is why we believe that by supporting entrepreneurship ecosystems, everyone can gain something - the country, the young people, and the companies like ourselves, who are in this market”, says Ana.

Finally, Ana gives a few tips to other companies that like Telefónica would like to play a greater role within the innovation ecosystem in Latin America. “The first one is that in order to really generate an impact at a country’s level, there should not only be an isolated initiative like an accelerator. If a company establishes only an accelerator and has no mechanisms behind it that stimulate youth talents in a university environment or even in the school environment, (...) the results they will get will not be as good as what those gained if they have a previous stimulation phase.” Additionally, “if after the accelerator there is no outcome, you have helped a talent that has no other tool to survive after coming out. My first recommendation is to develop integral programs like ours that address the issues from all their stages.” “From the ecosystem stimulation stage, the acceleration and support stage for startup companies in their early stage to the investment stage. Otherwise, no real impact is possible.”

“Another recommendation is to always support local agents for all their initiatives. For example, one cannot manage a fund from Silicon Valley when investing in Latin American companies, because if you don’t know the local environment, the help you will provide will not be adequate. (...) What you need to do is to look for local agents that understand the ecosystem and identify opportunities. If you establish an accelerator you will have to nourish yourself in order to the actions taken have a desired impact.”

Telefónica’s entrepreneurship initiatives in Latin America

The Open Future program, includes all open innovation initiatives of the group. The program’s approach is to address every life stage of entrepreneur development, from the moment an entrepreneur has an idea, to the setting of the company, through different initiatives:

Initiatives aimed at encouraging entrepreneurship in order to create entrepreneurship ecosystem that improve the local economy.

• **Think Big** aims to promote the entrepreneurship spirit, to promote among youth and even school children through mentoring and talks.
• The cloud online platform called openfuture.org aims to assist creative young people to find resources and materials in order to accelerate their ideas.
• Talentum is aimed at accelerating technology startup companies that are on their initial stage. That is, young people who have decided to start their entrepreneurship and already have a project but they are starting to launch and market it.
• **Initiatives aimed at accelerating**: in order to identify innovative products with a good value proposition.

There are two initiatives, continues Ana. “The first is the co-working spaces, which are currently being launched in Latin America (Chile, Ecuador and Costa Rica). They are shared spaces which are handed over to the local governments, while we offer acceleration services and networking support for startup companies that are still in their early stage.”

“The next phase would be the Wayra Academies, which are accelerators that provide not only resources and support for entrepreneurs but also invest in the startup companies. This is aimed at early startup companies that are in a more advanced stage than those at the co-working spaces.”

Initiatives aimed at investing: “These initiatives provide investment tools for funding their growth and going beyond their local
markets, in order to gain internationalization for their business.”

- “Amerigo funds network, whose main investor is Telefónica. It includes government participation of the countries where we are present and other private and public partners. We currently have a network of five funds in Latin America, with presence in Chile, Brazil and Colombia, which also includes México and Perú, covering a total of five markets.”

- “Tef Ventures is our fund of internal capital, managed by Telefónica, which can participate through funding and support or fund any company anywhere in the world under the condition that it clearly complies with the strategies related to our company’s internal mission.”

Image 4: Website Open Future program
Source: www.openfuture.org

UIIN Gateway helps you to increase your chances of funding by providing a sound dissemination, exploitation and sustainability strategy for your research project. The UIIN Gateway concept and service portfolio has been developed based on many years of experience and also integrates latest management concepts. We take into account the very specific characteristics of publicly funded research projects whilst also adding a business management perspective which ensures the successful transformation of science into innovation.

Learning from experience
UIIN Gateway has been developed based on the experiences and needs of the members of the University Industry Innovation Network and has also been shaped by the knowledge and experiences of the Science-to-Business Marketing Research Centre (S2BMRC) in Germany which researches university-industry relationships and innovation for more than 10 years.

Integrating latest management concepts
Besides the knowledge and experiences made in the field of innovation-driven research projects, the UIIN Gateway concept has also been influenced by latest management concepts. For example, the concept has been designed similar to the Business Model Canvas of Osterwalder & Pigneur - the most used tool for developing, evaluating and communication business models around the world.

If you are interested in adding a professional strategy for dissemination, exploitation and sustainability to your funding proposal, please get in contact!

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Ana Segurado | Director | Telefónica Open Future
Ana Segurado is Director of Telefónica Open Future, the Open Innovation programme of Telefonica that gathers all the initiatives around external innovation within the company (talent detection tools, acceleration and scale-up programmes and company’s VC funds). She was previously Director of Telefonica’s Amerigo Funds. Before joining Telefónica she was Investment Director at the Spanish leading Private Equity firm. Ana is also University Professor of Entrepreneurship and Business creation at Universidad Pontificia de Comillas, Madrid and frequent speaker in conferences and lecturer in courses on entrepreneurship. She is also a promoter of entrepreneurship contests and activities in Spain.

WEB: www.telefonica.com www.linkedin.com/company/galicia-open-future @OpenFuture
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Looking back on the last 20 years, which do you think have been the main trends in the development of LAC universities in respect to their third mission?

During the last 20 years, we have seen a vast change in the general perception of the third mission of LAC Universities. It is well-known that the LAC region has severe problems with its economic and social development, with increased levels of poverty and social exclusion. Multilateral organisations (OECD, ECLAC, etc.) and local governments diagnosed low regional development as a result of lack of competitiveness, and this as a consequence of the poor dynamic of economic innovation in the different LAC countries. This diagnostic concluded that one key factor of poor innovation is the weak relation between university and industry; therefore, university-industry relation is now a top-level priority in the public policy agenda of most countries in the region. This translates into increasing political pressures on universities to consider its “third mission” as part of its regular commitment with society. This is not new for many universities of the region with long and successful experiences in this field; however, in general, universities have only recently started including this new topic as part of their activities.

Which ones do you think are the current biggest challenges for the LAC universities to present themselves as good partners of industry?

This is a multi-dimensional problem and universities have a number of important tasks to improve their relations with industry.

First, it is necessary to undertake institutional reforms to adequate their organization to allow efficient relations with other actors, including business. Among other changes, a new design of institutional policies is needed in order to facilitate the contracts with firms to provide services and to transfer technology. Second, universities have to re-evaluate their academic programmes to offer professional degrees aligned with social needs. This requires an analysis of the changing societal needs, particularly considering the development of economic trends and grasp the opportunities to improve competitiveness with qualified human resources. Third, universities have to promote an entrepreneurial culture among their students and academics. They need to become open minded individuals, able to detect new opportunities for applying knowledge in a social and economically responsible way to promote competitiveness and development. Fourth, since innovation is a systemic process, universities have to contribute together with government, firms and social actors, to create adequate regional structures to promote innovation, entrepreneurship and competitiveness. However, to improve the relations between universities and firms it is also necessary that firms change their culture to be opened for collaboration with universities.

University Industry interactions occur in many different ways. Which do you feel are the main actions that LAC universities are taking in order to interact with business?

LAC Universities are very heterogeneous and unfortunately there are not studies of U-I interactions in LAC to show general trends about it. We only have some studies for countries like Brazil and Mexico that show technical services as the most usual way for these interactions. However, at the same time during the last years, we have seen an increased number of public policies in many countries to promote two diverse (and in some sense, opposite) mechanisms to organize and support U-I interactions, from the universities’ point of view.

On the one hand, the so called Link Office (“Oficina de Vinculación” in Spanish) has the general objective to promote and deal with the relations with all external stakeholders, including industry. After considering
many experiences of universities in LAC that assumed this institutional organization for U-I interactions, one finds that generally these offices do not have a clear and focused mission and vision for these set of activities. At the same time, it is usual to find that these offices have a lack of human, financial and technical resources to have an efficient interaction. The very wide objective and not clearly defined organisational structure has generally led to a weak and unstable level of interaction.

On the other hand, other policies are focused on the specific area of technology transfer and intellectual property. In general, they are called Technology Transfer Offices or Licensing Offices, and their tasks are mostly oriented to find interesting R&D outcomes from the university research and give them value patenting and licensing them. Until now, there is few evidence of the impact of these initiatives to promote innovations for firms and relevant incomes for universities. To sum up, we find that LAC universities still lack of a holistic view about how to organize their interactions with industry, giving an efficient but at the same time comprehensive answer to this relation.

University - industries are asked to be accepted as a new topic in the agenda of researchers. Which do you think is the current mind set of LAC researchers in respect to industry interactions?

In general, LAC researchers still believe that the academic activity does not have to be influenced or guided by industry. However, a small but increasing number of academics now agree to include U-I interaction as a new topic in their agendas. Unfortunately, these pioneers face the tight institutional regulations and the lack of incentives systems for academics as high barriers for this interaction. This situation shows that at institutional level, LAC universities are very resistant to changes in order to include new functions in their activities and U-I interactions is still not institutionalised, although university managers are gradually understanding its importance and undertaking some steps in the right direction.

Celso Garrido | Professor | Universidad Autónoma Metropolitana |

Celso Garrido is a full-time professor in Economic Department of Universidad Autónoma Metropolitana Campus Azcapotzalco in Mexico City. As an economist, he is an expert in finance, firms and development. It has published a number of articles and books on this subject in Mexico and abroad. Furthermore, he did research consultancy for the Economic Commission for Latin America and the Caribe (ECLAC), International Development Bank, UNCTAD, etc. He is currently the promotor and coordinator of a university network, RedUE ALCUE, created in 2013 and integrated by more than 30 Latin American universities to promote interaction with business.

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The development of Medellín

Talking about the transformation that Medellín has been through in the last years, Mr Quintero explains, “The transformation of Medellín has a very long history. It is a transformation that unfortunately took place more categorically as a result of a critical moment for the whole country, the war against Pablo Escobar in the late 80s and early 90s. The city was undesirably listed as the most violent city in the world with a record of 381 murders per 100,000 inhabitants.

What happened was that Medellín worked together as a city. When the city bottomed out, government, educational sector and business industry organized and created a common mission, making the city feasible in a national and international context. While the government was fighting against the war of violence and drug trafficking, the whole institutional apparatus continued to support the public administration and obviously, worked to create specific capabilities to advance the city. The majority of the companies of the Antioquia region started to trade shares. The property was enlarged. The shares and properties were distributed and business owners had to stay here. The society of Antioquia decided to join them together in order to move the city forward”.

He informed that there were three different periods with plans that built on top of each other. In the early 2000, academics started to participate in the public life and create long-term plans independent on any political party, which were adopted by all parties. In 2002, a mayor started to transform the city and talk about the importance of education. Later on, another mayor raised the importance of entrepreneurship and the current mayor has kept education and entrepreneurship and introduced the concepts of science and technological innovation.

The creation of Ruta N

The story of the origin and creation of N route is very exciting. Juan narrates, highlighting the role of the Chamber of Commerce in the city’s economic development, including Ruta N.

“What about a decade ago, the Chamber of Commerce conducted a survey about the competitive advantages of the region in which three clusters were prioritized: energy, healthcare and IT, along with construction, textile-garment industry and tourism and there was a generational renovation in the region’s business development as the government started to work on these clusters.

Since the previous mayor emphasized education, entrepreneurship and innovation, the building of an educational and a business center was initiated, Ruta N, consisting now of 38,000sq metres. The current mayor took over and said that it is paramount that a science and technology strategic plan was developed resulting in a science and technology strategic plan for 2021, focusing in healthcare, energy and IT. In order to fund this plan, the City Hall approved that 7% of the surplus value of our service company (around $230,000), would be invested in the science and technology strategy until 2021.”

Mr Quintero explain how five years ago the Ruta N served as an example to develop an information technology district, Medellín Innovation, with the aim of attracting more capital risk funds, more creativity,

FROM GUNS AND DRUGS TO COLLABORATION AND INNOVATION

THE OUTSTANDING TRANSFORMATION OF MEDELLIN

INTERVIEWER: Victoria Galan Muros
INTERVIEWEE: Juan Camilo Quintero
WEB: www.rutanmedellin.org

In the 1980’s during the time of drug kingpin Pablo Escobar, the Columbian city of Medellín was once the most dangerous city in the world. However the city is now a shining example of how cities can transform themselves from the worst of situations, given a fully-functioning triple helix of government, business and universities working collaboratively. Juan Quintero, Executive Director of ‘Ruta N’ speaks with UIIM about this fascinating transformation.
more researchers and host all the country’s research centers to have a real innovation Hub in Latin America.

University-Industry Cooperation as the pillar of Ruta N

Juan Camilo explained how 12 years ago, a visionary business owner in the city, who was on the University of Medellin’s Board of Directors, proposed to create multidisciplinary research groups of excellence that collaborate with each other and also with industry, because at that time the university work with industry with minimum.

“The work of the university and the industry was brought together in order to generate more work, competitiveness and greater development of the region”, highlights Juan Camilo. “For the first time in Colombia a University-Business Committee, called TECNOA, was created to bring together business people and researchers. The business needs are constantly monitored and communicated to universities to fund them through the national and regional innovation systems. TECNOA has hold almost 200 monthly meetings in a continuous basis, for university to talk about the research-related activities and business people to propose their ideas.”

“Implemented in the 70s, Colombia’s public universities followed the socialist model, which isolated them from the global reality. However, 10 years ago a migration from this ‘ivory tower’ concept commenced towards a university undertaking more applied research which supports the needs of not only the educational sector but also in making Medellin a more competitive city.” Juan Camilo explains how good relationships between universities and the government in Medellin are: “they are the best in Colombia and probably one of the best in Latin America. Medellin will hopefully be an example applied to the other cities of Colombia; however, we still have work to be done, especially involving SMEs, because the main industries now have patents, technological transfer and we have generated spin offs.”

His experience in Medellin allows him to advice other cities that are considering a similar innovation development path. Juan Camilo admit that without the public and private sector working together, it is very difficult and unfortunately, in Latin America, this is not common. “Firstly, I think synergies need to be generated by the Triple (or quadruple) Helix, which is not only university, companies and state but also society. Secondly, we cannot be experts in all fields so we have to identify what comparative advantages one has and introduce skills to develop further competitive advantages.”

Thirdly, we need an institution that is responsible for the topic and has a budget. What happened in many Latin American companies is that all of them have in their mission to be the most innovative, but they don’t have a responsible person for it, so it is only words and not action. The same thing happened in the cities, they talk a lot about migration towards innovation topics but they don’t have an institution that is responsible for it.”

Juan Camilo clarifies, “We are basing the innovation process on three items that include: (1) strengthening institutions in the city, (2) connect closer to the world to let more ideas circulate, (3) direct more investment to science and innovation technologies, allowing greater money flow. All this sums up to a very important concept that is simplicity. We have to go back to simplicity by trying to understand that things can be complex, but if it is surrounded by simplicity, we will get there more easily. It is not always necessary to have a PhD, have patents or a very sophisticated ecosystem, if there is an intention, an analytical capacity and practicality, we can create a scenario in which innovation takes place.”

Medellin treasures a truly successful story of persistence, vision, cooperation and success and Juan Camilo sees me off with a proud smile, conscious of his lead role in this outstanding transformation.

Juan Camilo Quintero  | Executive Director | RutaN

Juan Camilo Quintero is the Executive Director of Ruta N, although he has also belonged to the board of more than twenty national and international organisations and has hold several managerial positions within the public sector in Medellin. Quintero is an expert in strategy, project management and evaluation and has successfully led some initiatives related with innovation and fundraising for the mining and manufacturing sectors in Colombia. He is a passionate and practical innovation manager that has been recognised as one of the most successful managers nationwide.

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Early in June, a business and academic summit addressing common issues and potential areas for development between Europe, Latin America and the Caribbean was held in Brussels as a lead into the CELAC-EU Summit, attended by the presidents of the 61 countries. The two day Academic Summit aimed to address key issues in Higher Education, Science, Technology and Innovation affecting the participating regions whilst also contributing key messages for discussion and policy consideration at the presidents CELAC-EU Summit. The summit brought together academia and the business communities in a common working session to exchange on how to spur innovation at the bi-regional level. Key points from the Innovation Session of the Academic Summit addressed three key areas including the regional innovation system, SMEs’ role and universities’ role.

Regional Innovation Systems:

In respect to regional innovation systems, there was a consensus that national and regional policy plays a substantial role in developing productive relationships between business and universities, which the participants saw as the role of government. There were calls for evidenced-based policy, with Alicia Bárcena, ECLAC Executive Secretary, presenting compelling evidence of the predicament of Latin American and Caribbean innovation systems.

With the notion that change takes time because people and institutions change slowly, is vital for governments to build a functional innovation ecosystem, wherein stakeholders work collaboratively. Alicia Bárcena also led a call for greater focus on key topics,
sectors and ‘challenges’ as “we can’t do everything!”. Further areas of focus in respect to building the regional innovation systems involving business and universities working collaboratively, included greater emphasis on:

- Developing regional pacts/alliances/networks/exchanges,
- Empowering institutions as important change agents,
- Developing relationships built on mutual benefit for long terms development,
- Focusing on people (development, incentives, exchange...), often missed by policy.

The role of SMEs

Given the fact that SMEs dominate the Latin American and Caribbean landscape, there was specific attention given to them. There is a strong need for SMEs in the regions to invest in R&D, however, with a lack of investment capital and access to capital, a subsequent lack of R&D focus occurs. Furthermore, SMEs in the regions also lack the capability to undertake research, with limited numbers of researchers per capita as compared to industrial European nations, whilst also often lacking quality. This leads to an urgent need to have scientifically-capable employees developed through their university systems.

Ms Carmen Agüero Castañeda, Coordinator of Innovation Projects at TEC of Monterrey (Mexico) nominated access of SMEs from both regions to global value chains as a further area of importance, as was the significance of intellectual property rights protection.

Moreover, without the ability to invest in R&D to expand their innovation chain, or resources that can be dedicated to expanding into new markets, SMEs also lack an international focus and linkages. Further issues for SMEs nominated at the summit include:

- a need for better understanding of IP,
- a need for better access to IP and IP protection (IPR SME help desk),
- a need for improved ICT competencies.

The role of universities

Universities were perceived as highly important vehicles of change in Latin America and the Caribbean in their quest to move towards becoming knowledge societies. This was underlined by René Ramirez, Minister of Higher Education, Science, Technology and Innovation of Ecuador, who also pointed out that universities in this context have the potential to be a key source of knowledge development; although this is not achieved in isolation. Collaboration between university and business was viewed as crucial for converting this latent potential possessed by universities into full economic and social value. Despite the high focus on commercialisation of R&D results, the summit recognised the contribution of collaboration between universities and business in respect to all research, education and valorisation activities.

Specific to Latin America and the Caribbean, there was a need for greater numbers of researchers, greater focus on developing research quality and also a need for focussing on more radical forms through active and collaborative open innovation networks. Lastly, universities in the regions were perceived to be highly bureaucratic, what caused them to move slowly, meaning that all these change are taking time.

The summit also presented the lessons learned and recommendations of the EC co-funded Mercosur IPR SME Helpdesk initiative which started in November 2013, which will be extended to the entire Latin American continent during the second half of 2015. The Helpdesk facilitates the expansion of the European SMEs, which are interested in or already operating in Latin America, through increased know-how of the usage and enforcement of the IP rights system.

Finally, as a result of this session of the Academic Summit, eight messages were sent to the CELAC-EU Summit, including:

1. The need to better integrate SMEs in trade and investment opportunities,
2. The need to develop sustainable business cooperation policies,
3. The focus on bilateral cooperation between the EU and CELAC as a major tool for innovation,
4. The need for developing cooperative instruments (policies and other) to facilitate this bilateral cooperation,
5. The need to improve access to finance and financial instruments for SMEs,
6. The need to support SMES investment in R&D and innovation,
7. The need to promote existing and develop new SME IP property right instruments,
8. The need to foster greater levels of university-industry cooperation in all three missions: research, education and valorisation.
The story of Manuel Perez Alonso is not the typical story of an academic. Frustrated by the apparent lack of impact that science generally was having on society, he embarked on his own journey of knowledge valorisation by starting his own company. Here Manuel describes this process in his own words.

“In the case of my first company, the journey that made me create it was realising that what we were developing research projects, the knowledge accrued during the process ended up in being published as results in scientific articles and that was where it all ended,” he said.

“At the time I was much younger than now and I saw around me that all researchers in Spain ended their work after the publication,” he reflects. “After that, another research project would take place and after a lot of effort and high costs ended with another publication. It was a cycle that never ended. I saw no practical use. “

“At the time, I was involved in European genome sequencing projects including almost one hundred laboratories from over the world. Other colleagues from the same project, who were creating companies involved in DNA analysis, inspired me,” he comments. “Thus, I thought this would be the most logical way to exploit this kind of knowledge and technology and that is when I initiated my first entrepreneurial activity in 1998.”

Since that time Manuel has continued on creating companies, a total of 11, now still involved in nine.
of those ventures related to biomedicine, genetics and genomics and all headquartered in Valencia. The question arises, ‘what takes an academic on the path to become a serial entrepreneur?’, a question which he is often asked.

Manuel responds “This is a question many of my friends and colleagues asked me. The answer is simple. Except the second one, which was a special situation, the rest can be answered quite simply. Because the activities developed by each one of them are so different, it would cause too much dispersion if all these activities were to be developed within one of the pre-existing companies.”

He continues, “However despite their differences, they complement each other. They complement so much that one of the companies collaborates with another. The companies I have founded highly collaborate with each other and find multiple points of synergy.”

Despite the apparent ease with which Manuel describes this process, like all new ventures, there have been a number of problems and issues that have arisen. This is especially the case given the nature of the environment from which they come, academia.

“The major problem that I have always encountered is the lack of comprehension from my colleagues and from academic researchers generally,” Manuel says frankly. “They do not understand why an academic researcher would get involved in creating a company.”

“In a way, they see me as a traitor to science. This is a very common attitude still in existence. In some cases, I am praised for my decision and determination for doing these kinds of things, but there is still a lot of incomprehension,” he explains.

Reflecting on the Spanish context, Manuel comments “It is a pity. I think this is one of the biggest problems that the academic world is facing, especially in Spain. It is a total disaster to be accused of having commercial interest when applying knowledge in the world of science. This is one of the major problems.”

There are obviously some very practical issues with wanting to take knowledge out of the academic domain. One such issue is finding trusted and experienced confidants who can provide necessary advice to academics choosing this path.

“Another major difficulty that I have encountered on my way was to find really professional advice and complying with basic requirements that I consider ethical,” Manuel remarks. “Finding loyal independent advisors that really take care of the entrepreneur are not easy to find.” He continues

“Luckily I now have them, but I have seen many professionals who are looking for their own direct benefits without thinking about the entrepreneur’s needs.” He says frankly. “Entrepreneurs in the world of science, as it is my case, are much unprotected persons because the scientific world is very idealistic, made of dreamers that cannot keep both feet on the ground. That makes us entrepreneurs in the world of science very vulnerable.”

Like entrepreneurs generally, academic entrepreneurs need to find opportunities motivation when others see none. The pressures of academic work are added to the pressures to maintain and grow a business, a seemingly insurmountable series of challenges.

“The main force that has made me move forward is the satisfaction I get when seeing my work as a real and tangible service or product, from which citizens can benefit. This satisfaction is absolutely unique and overrides all efforts.

Manuel described a recent story about a PhD student who is starting his career in science. “Not long ago, a student that is working on his PhD in Barcelona told me, that he is conducting experiments that then end up in publications.” He continued, “This is the path that he thinks will never enable him to see the real results of his own work.”

“This is very different to what a carpenter experiences after building a chair. After his work, he sees a chair that another person can actually sit on.”

“We have a problem in science that is, the very long journey of the experimentation generated to benefit health that is undoubtedly necessary,” he says. “What happens is that within this long journey of experimentation that requires a lot of effort in general, there is no vocation about the results being applied to society.”

“In Europe we are sadly experiencing, (science) in a tangled mess, a labyrinth. The great majority of experimentation remains in publications and papers,” he states. “I had already witnessed this when I was almost twenty, I saw that this would be the case all my life (if I stayed in science), being stuck in this tangled mess.”

“I was clear that I had to come out of it and do something that could reach citizens. This is my main force, seeing things in place.”

Reflecting on his success, Manuel reflects on his mission to create useful products and services for society as his main motivation, something that has not always been understood that same way.

“I think that the key to success is determination and vocational service to society,” he remarks. “Some of the things that entrepreneurs and business people
have positively criticized is the fact that I used to say that money is not fundamental for companies."

“What makes a company move forward is generating authentically useful products and services”, he continues. “We need to make this happen whilst obviously attaining this sustainability. We obviously need to make greater income higher than our expenses, to prevent our company from closing down.”

He reaffirms “The focus point of our business should not lie on money. I have always defended this and believe that it is one of the key points. I have seen companies in the technological sector that have gone down and I think the reason was because they focused too much on money.

“Money is basic and important for any company but it should never be its main focus. A company’s epicenter should never be located in money matters. The companies I have been involved in have focused exclusively on social benefit and obviously, then look for sustainability. I believe that this should be the priority. I am convinced about it.

On why he maintains links with the university, Manuel reflects on his role as educator as a driving force.

“That is where ideas, knowledge and young people are and I learn a lot from them”, he remarks. “I think it’s similar for all of us who teach at universities, I know that I don’t want to give up on that link with university for that reason.”

Having your own companies, whilst being independent obviously requires a great deal of time management and support from others.

“When I am at university, my priorities are the students, spending time in the classroom and offices hours” he comments. “I try to fit the pieces of my planner like a puzzle, mainly by prioritizing and disregarding secondary activities that I consider to be less important or essential.”

“A very important thing for me is the companies I am involved in are totally autonomous. They do not need my presence at all or have any kind of daily activity that depends on me,” he describes. “There are great and autonomous teams that act independently and just ask for my opinion or advice in certain cases. That is very important for me.”

“I am lucky to have partners, especially female partners in the companies. That might be another key to success. Women mostly manage the companies I am involved in.”

There are distinct advantages in developing business using science, not least of which is the opportunity to build a sustainable competitive advantage. This is something that Manuel too has experienced, as all of his businesses are ‘close to science’

“This has proven to be an advantage. Being close to science and the academic world is a fundamental advantage,” he says. “It is not the same to create a company that is distant to the academic world, where this flux of skills is less likely to take place. This is especially true in the domain of genetics and genomics where really revolutionary technological advances are taking place.”

This is further emphasized by Manuel, “Almost, I won’t say every month, but every year, this advance is so big that the only way to live what is happening is by being close to the university. This contact is very important for us as it enables us to not anticipate, but to follow this advance and apply them rapidly so that we don’t stay behind.”

Manuel Perez Alonso | Genetics Professor and Serial Entrepreneur |
Manuel Perez Alonso (PhD in Molecular Genetics) is a researcher and entrepreneur in biomedicine. Professor of Genetics in University of Valencia, founded the Molecular Genetics Laboratory, where he has led +30 projects, participated in international DNA consortiums, published in high impact journals (i.e. Nature) and transferred 4 patents to industry. Since 1998, he has been involved in the creation and management of eleven companies in the genetics field, like GENAGEN, GEM BioSoft, Valentia BioPharma, Genera Biotech, etc. From 2012, he is also the president of the BioRegion of the Valencian Community (BIOVAL) and president of the Spanish Association of Entrepreneurial Scientists.
The government of Central Finland decided to analyze the overall picture of their university-business-cooperation (UBC) environment in order to help the managerial and policy decision-making and the Finnish company Business Arena Oy was in charge of putting this in practice through an ESF-funded study, Operaatio Metsonpesä. They are sharing a summary of their findings with the UIIM readers.

Individual strengths of Central Finnish HEIs reflected their focus areas. University of Jyväskylä (JYU), a scientific university, was most robust in research-driven cooperation projects and continuing education. JAMK University of Applied Sciences (JAMK), a strong applied university, cooperates mainly via student, applied R&D projects and active entrepreneurship development. HUMAK University of Applied Sciences - Jyvöpent. ia (HUMAK), a small applied university focused in NGO sector, was able effectively cooperate with its niche market, making its scarce internal resources count where they matter. Results from Central Finnish adhered Finnish averages of the European Study, but what set local HEIs apart was a low level of perceived staff mobility (i.e. temporary employment of academics by business and vice versa) and governance (e.g. HEI staff members in strategic positions in company boards and vice versa).

In view of local businesses the UBC potential in Central Finland is significant. Less than half of businesses had cooperated with an HEI, mostly in student mobility, such as internships and thesis (84.2%). Only selected few businesses had been involved in “more complex types” of cooperation, such as R&D projects (13.5%) or curriculum development and delivery (7.9%). Business state that in half the cases it was a student the one that initiated the cooperation with them, confirming that students are the business card of the universities.

The study summarized results into five key recommendations.

1. Coordinate the “big picture” of UBC
Like elsewhere in Europe, problems arise from the fact that UBC activities are typically organized in silos. No one is tasked with leading the big picture. Only few understand the wide variety of different ways in which an HEI can actually cooperate with business. Also current metrics for evaluating the impact of UBC are insufficient. Lack of learning arenas for transferring tacit knowledge between individuals impedes the results. Internal competition between departments and lone wolf behavior of HEI staff members was said to be too common. Interviews and focus group discussions revealed that much of the UBC in Central Finland takes place unofficially under the radar. This activity needs to be made visible and actionable.

2. Leverage existing cooperation, such as students working with business
This study found out that existing connections and cooperation is not sufficiently leveraged. It is difficult to identify moments when different UBC types are linked to each other and could lead to further cooperation. There are not enough intermediaries to connect the dots and facilitate the process within HEIs or externally. Only the most active teachers do “after-sales”, following a finished student internship with a cooperation proposal. Students have the potential to be excellent university ambassadors - this is one of key solutions for improving UBC.

Furthermore, Central Finnish HEIs do not make full use of their recognized strength and activity in life-long learning services. Professionals tasked with UBC promotion should systematically meet with MBA students and participants of other continuing education pro-
grams, since they are a very potential match for research and project partnerships.

3. Provide HEI staff members with new areas to utilize and develop their expertise or professional roles
Researchers and teachers in Central Finland perceive low personal benefits and incentives from their participation in UBC. Professional growth motivates academics, but structures within HEIs do not provide career advancement opportunities. Often the only way forward in salary level from teaching duties is to venture to administration. Relatively few make use of staff mobility and governance opportunities, partially due to perceived high administrative and bureaucratic barriers.

Another major key solution for this would be promoting HEI staff members as ambassadors for strategic positions - as business advisors, board members and mentors. This way they would be able to forge deeper ties and initiate two-way transfer of tacit knowledge. After all, Finnish strengths are in unofficial cooperation and straightforwardness. Why not build upon this?

4. Harness the power of voluntary and unofficial activity
Outside the official structures of universities and RDAs is a spurring movement of voluntary activism that should not be smothered to death. Student-run entrepreneurship societies, student and business associations are filling the gap left by the official establishment in promoting UBC. Finland has a long history of student-run organization, and recently their attention has switched to advancing student entrepreneurship and culture. Everyone would benefit, if enthusiasm of young students, active entrepreneurs and HEI staff members is harnessed and leveraged.

5. Focus on incremental improvements: utilize existing knowledge and re-think work processes
There are no simple tricks to increase UBC. The way forward is making small adjustments to ordinary work roles and processes: small tinkering, new encounters between people, contacts, discussions and information sharing. In the end it is not about trendy innovation centers, business accelerators or such, but about dynamics of personal motivation.

Comment from study authors: using the UBC ecosystem model on a regional level

"Having done plenty of field work to bridge the gap between the worlds of business and universities, we knew from experience that UBC doesn’t happen in a static world of organizational boxes, but in a dynamic system, effected by personal perceptions and biases of its participants. Whenever planning any activities to promote UBC, it is essential to consider which perceived drivers, barriers and benefits facilitate or inhibit individual academicians’ mindset. The UBC ecosystem model developed from results of the UBC European study takes this extremely important factor into account."

Impact of the study - according to JAMK University of Applied Sciences

"This study provided regional developers and HEI management an insight into the big picture of UBC.
It reinforced results from previous studies and quantitative approach backed earlier assumptions on the issue.

The study provided straightforward ideas to improve UBC by leveraging existing strengths and cooperation. Students are truly the most valuable resource of an HEI. They are the representatives of the university in the eyes of most business partners. We need to ensure that students and guiding teachers are aware of what we as university can offer and help everyone to be better prepared for recognizing different pathways of cooperation.

Perceived limitations of staff mobility and governance came as a surprise to us. It is the responsibility of the management to remove bureaucratic barriers that prevent HEI staff from being mobile, or participating in strategic governance. When thinking of success stories from universities across the world, they often have one thing in common: a strong personal drive of the HEI professionals to make something happen in their field of expertise. JAMK has such stories, like Tiimiakatemia, an entrepreneurship centre of excellence.

How many HEIs have been able to crystallize the primary reason, why UBC needs to be expanded, so that all staff members have adopted the idea? Financial reasons stemming from the need for additional funding are another thing - they don’t motivate the individual. The question is how we create hunger for more cooperation with businesses.”
In the 1800s, Lord Kelvin stated that “to measure is to know and if you cannot measure it, you cannot improve it”. The heterogeneous nature of university-industry collaboration makes it difficult to quantitatively capture it; however, the Centre for Science and Technology Studies (CWTS) at Leiden University has achieved very accurate measures of university-industry co-publications, one of the main outputs of university-industry collaboration. The developers of this very useful tool explain to UIIM its importance and utility.

UNIVERSITY-INDUSTRY RESEARCH CONNECTIONS 2014:
DATA-MINING THE WORLD’S SCIENCE

How come we know so little about the ongoing relationships between universities and industry if they are considered so important for both parties and even more important by policy makers and politicians for their potential contribution to economic development further down the line? Well, because publicly accessible information on university-Industry linkages is thin on the ground, and hard to collect systematically at a large scale.

One of the options to partly overcome this slightly embarrassing information gap is to focus the attention on the university side of this relationship, to examine their publications in the open research literature. University researchers need to publish for career purposes and to share achievements with colleagues worldwide. Interestingly, many research-related interactions and collaboration between universities and industrial partners eventually lead to publications in scientific journals, conference proceedings, or other (printed or online) outlets. This source reveals quite a lot of interesting information. The names of their corporate researcher partners are often mentioned in the author list of these joint publications, alongside their institutional affiliations in the corporate sector. These jointly authored ‘University-Industry co-publications’ (UICs) present a wealth of information on research collaboration patterns and trends between universities and businesses worldwide.

UIC-based data can be applied as an indicator of various features of university’s connections with industry: (a) research collaboration; (b) knowledge flows and exchanges (c); industrial orientation and innovation support capability; (d) researcher mobility between university and industry. Over the last decade several academic studies have started to mine this source; initially within case studies, but more and more also for producing internationally comparative statistics. The Centre for Science and Technology Studies (CWTS) at Leiden University, contributed UIC-data to European Commission’s current annual series of Innovation Union Scoreboards and its predecessor European Innovation Scoreboards. More recently, our country-level UIC data were also introduced as a ‘connectivity indicator’ in the 2014 edition of the U21 Ranking of National Higher Education Systems. UIC-based performance indicators have become an established reference. At the level of individual universities, some UIC data are now also incorporated in the freely available U-Multirank system and CWTS’ own Leiden Ranking.

University-Industry Research Connections 2014

CWTS also recently launched the University-Industry Research Connections 2014 (UIRC 2014), the sixth edition in this annual series, now offering extensive information on UICs for 750 universities worldwide. It includes articles and review articles published in international scientific journals in years 2009-2012. UIRC 2014 is freely accessible at www.cwts.nl/uirc2014. It allows monitoring and assessing research collaboration between universities and companies. This information
tool is meant for a wide range of users; not only university administrators, deans of research, and other decision-makers at universities, but also with technology companies and in science policy arena’s.

What type of information does UIRC 2014 offer? Our UIC intensity indicates the degree to which universities co-operate with industry in the joint generation of knowledge in open science. The other three indicators, % Local, % Domestic and % Foreign, tell us where the each university’s industrial partners are located. By unraveling the geographical distribution one can examine the extent of the impact on industry: is it just on partners close-by, or is there a truly global outreach?

Graph 1 presents a screenshot from the data table on UIRC 2014 website, with figures for the world’s most UIC-intensive universities. In this specific case, across all fields of science in total (‘All sciences’). Not surprisingly, the universities of technology are in top ranking positions. These are academia’s hot beds of industrial relevant research. Sometimes those partner companies are located very near the university, thus producing a high score on ‘% Local’. For example in the case of Eindhoven University of Technology it accounts for half of all UICs, which is largely due to Philips, the large electronics company located in Eindhoven.

UIRC 2014 provides UIC data for several scientific areas, dubbed ‘broad fields of science’. By providing more detailed disciplinary profiles for each university, it shows in which of those fields they co-operate more intensely with the business sector. These broad fields are: Cognitive Sciences; Earth and Environmental Sciences; Life Sciences; Mathematics, Computer science, and Engineering; Medical Sciences; Natural Sciences and Social Sciences. Drilling into data even further, we find that the “% Domestic” score of Eindhoven University of Technology in the field of Mathematics, Computer science, and Engineering is a whopping 74% – very much a result of the “Philips effect”.

The website also presents a series of graphical overviews of UIC distribution patterns in the scientific landscape, showing those regions of science (scientific disciplines, more specific than the broad fields of science) where UICs are more frequently published. Besides a UIC world map, a graphical overview of all UICs distributed across world science, two maps at the level of individual countries (United States, and The Netherlands), and at the level of individual universities (such as Harvard, MIT, and Cambridge University) are visualized. Graph 2 presents the UIC density map of USA-based science, where UIC activity is concentrated in the red highlighted areas.

A map is not the territory; neither do UICs reflect all university-industry R&D connections. These co-authored publications represent the visible ‘tip-of-the-iceberg’ section of the co-operation between the two sectors involved. It is an important tip nonetheless, because it projects a publicly available image of how much, and where, universities currently engage in research cooperation with companies.

<table>
<thead>
<tr>
<th>University</th>
<th>Country</th>
<th>%UICs</th>
<th>% Local</th>
<th>% Domestic</th>
<th>% Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eindhoven University of Technology</td>
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<td>51</td>
<td>73</td>
<td>30</td>
</tr>
<tr>
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<td>41</td>
<td>64</td>
<td>39</td>
</tr>
<tr>
<td>Tokyo University of Agriculture and Technology</td>
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<td>49</td>
<td>96</td>
<td>7</td>
</tr>
<tr>
<td>Delft University of Technology</td>
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<td>21</td>
<td>66</td>
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</tr>
<tr>
<td>Osaka Prefecture University</td>
<td>Japan</td>
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<td>38</td>
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<tr>
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</tr>
<tr>
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</tr>
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</tr>
<tr>
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<tr>
<td>Tokyo Institute of Technology</td>
<td>Japan</td>
<td>11.5</td>
<td>56</td>
<td>87</td>
<td>14</td>
</tr>
</tbody>
</table>
Of course, UIRC 2014 does not provide the complete and ultimate picture; it presents us with a window into universities for looking more closely at their collaborative activities. And it opens up avenues to collect detailed information at universities, perhaps jointly with those same universities, on their connections to industry and the business sector.

All in all, UIRC2014 offers a powerful analytical tool to inform us on effective and fruitful interactions between university and industry. This perspective is becoming increasingly important in the world of higher education, where universities are under external pressure to also demonstrate their contributions to innovation and the knowledge-based economy.

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Robert Tijssen holds the Chair of Science and Innovation Studies at Leiden University and research fellow at this university’s Campus The Hague. He is also professor at Stellenbosch University in South Africa. Robert’s interests are at the nexus between science, innovation and higher education. His current empirical studies focus on university-industry R&D interactions, globalization of science, and science indicators for national higher education policies. His advisory and consultancy work relates to monitoring and evaluation of scientific research performance at universities, with a special focus on measurement, quantitative indicators, institutional benchmarking, and international comparison.

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