

# Alcalá Hub strategy

## How to roll out the European PhD Hub vision

### European PhD Hub

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## 1. Introduction

The main goal of this document is to establish a tentative scheme to improve the Academia-Business cooperation in terms of PhD studies. Focusing on Spain area, it is important to remark that PhD lines are not usually developing in the same path that Business, Society or Companies are expecting. Due to that, this document will encourage to approach the cooperation between both sides in order to empower the cooperation in a win to win way. For one side, the companies will benefit of the development of research lines by a PhD Thesis. From the Academia perspective, the development of PhD Thesis aligned with the expectations of the Business/Society/Companies will provide more benefits beyond the typical indicators such as articles, conferences or in the best case a patent propose.

## 2. Current state of Academia-Business cooperation in Spain

According to the European Higher Education Area usually named Bologna Treatment, all PhD studies should be harmonized under a same regulation frame. However, the application and implementation of this new frame in the last 20 years focused on the PhD studies, have been done far of the Business needs. So, the Academia environment has usually developed the PhD lines according to the expertise of the Research Group/Supervisor without relevant interest to be transferred to the Business area in most of the cases. Although the typical profile of PhD students in the last 20 years were fully oriented to a future into Academia/Research environment, nowadays the vision of the current PhD students is fully oriented to the Business sector.

In other way, the Companies have not been able to detect the need of High Qualified staff for their research strategy providing the improvement of the know-how of the company. This matter must provide to the Companies an added value to be more competitive and positioning in the highest positions in the market.

Due to the previous arguments, the different Government stakeholders (National, Regional and local) have deployed several initiatives to improve this situation. Special interest is the new Call “Industrial Doctorate” funded by National and Regional Governments (Madrid, Catalonia, Andalucia, etc.), It invests for a co-funding formula where half part of the PhD scholarship is funded by the companies and the other half one by the Government. These Calls started around 2014 and the total number of enrolled PhD Students per year can reach around 100. So, this initiative is one of the lines to explore and take advantage of it. Out of this initiative the usual way to develop PhD lines with the Business cooperation is limited to a symbolic number of cases. Most of the PhD Students who are doing in a simultaneous way the PhD and work stage in the Company, are doing lines with personal interests far away of the “daily tasks” in the Company. However, in some cases when the cooperation between Academia-Business is consistent based on a previous background specific PhD lines are developed aligned with the both sides interests. Therefore, this is one success example to follow and try to re-implement in those cases where it can be possible.

Therefore, the main barriers to address in the enhancement of PhD students in companies are related to the promotion, benefits and needs from companies to hire this type of students. They need to obtain an immediate benefit in the company with the developed work in the PhD thesis and for the promotion of a key profile into the company for future strategic research topics. Other relevant issues such as intellectual property, PhD regulation or features for a co-supervision Business-Academia must be clarified to improve the collaboration.

This brief overview of the current state of Business-Academia cooperation in the field of PhD Studies conducts to the enhancement between the both sides. The Academia side has the important role to inform, convince and explain the benefits of PhD studies for the improvement of the company. It forces to establish new initiatives like PhD Hub framework to empower the communication. From Business area, it must realize the importance of the PhD for the company and the mission from its side to contribute in that. This does not mean in all situations an economical support, but an important change of mentality is mandatory.

Regarding the main fields to prioritize with PhD-Hub strategy, according to the areas with more involved PhD studies, Economics, Management and Engineering/Computer-Science fields should be the ones to focus the actions. University of Alcala has Faculties in those areas and a multi-disciplinary team will be on board for the promotion of the Local PhD Hub. However, UAH does not limit the action to those. Therefore, other areas such as Pharmacy, Chemistry and/or Humanities will be explored in order to analyze the current state of these fields.

## 3. The Alcalá Hub Strategy

### 3.1. A wider vision

Even though the principal goal of the Local PhD Hub shall be the approaching of PhD Research Lines to Business' interests, and most of the concrete actions are designed to meet the specific objectives connected to it, these strategies are embedded within a wider vision. In fact, the Local PhD Hub shall ease the path for those businesses that may seriously consider this space not only as a sort of marketplace, but also the arena where they could express their wish to conduct an in-depth analysis into a particular technical problem, with the benefit of close collaboration with experts from the HEIs present there.

On this reading, the Local PhD Hub would become a unique space for current employees in research-oriented roles within a commercial organisation to bring about research initiatives; for these institutions/companies to clearly articulate they needs of collaboration with academic researches; and, eventually, to turning research students into innovation leaders.

### 3.2. Benefits of the creation of the local PhD Hub and local PhD Hub strategy

In other words, the local PhD Hub would prove to be a vantage point for both HEIs and business from where strengthened their relationship in building a truly applied research community, which may be described at different levels:

- 1) Academic supervisors and the commercial organisation will be able to plan the scope and activities of future research projects in detail.
- 2) More practically perhaps, existing openings published within the Local PhD Hub may induce companies wishing to hire PhD candidates (or students recently awarded with a PhD) to participate in the further common doctoral programmes by contacting the HEI through the Hub to find a suitable member of staff who could be a collaborator (i.e. Industrial doctorates)
- 3) A new generation of independent researchers who will impact and influence across academic, scientific and industrial boundaries, shall have incentives to initiate themselves a new cycle of activities within the local PhD Hub strictures (i.e. PhD Hub alumni)

### 3.3. From local to international

The former considerations drive us to a general assessment of the sustainable impact of the PhD Hub both locally and internationally. Within this strategy, stakeholders interacting through the local PhD Hub shall be able to combine, at a European/international level, cutting-edge theory and traditional PhD research training with professional and broad technical skills required by industry from diverse sectors including commercial organisations, Government, research institutions, and not-for-profit sectors.

Indeed, by collaborating in the local PhD Hub, universities and their partners shall be able to respond to their shared challenges and specificities while remaining connected to a European network of universities and companies and therefore sharing and co-creating information as well at European level.

### 3.4. Further activities within the Local PhD Hub

According to the PhD Hub project goals and aims, the Spanish PhD Hub is going to launch a first initiative to approach the communication between Academia and Business stakeholders. To get that goal, the participation of Business Confederations with a continuous cooperation with both sides, will provide a good scenario to start the approach. The profile of these organizations allows the cooperation knowing and sharing the needs and lacks from both sides.

Thus, several seminars will be organized to expose to the Business area the benefits of the PhD lines in grown process of the company.

The main points to discuss in these events will be:

- Presentation of aims and goals of PhD Hub project
- Regional and National Initiatives to co-fund the PhD candidates developing the PhD Stage in company.
- Initiatives to reduce the taxes for hiring PhD staff.
- Successful cases with PhD staff enrolled in companies.
- Successful cases with PhD students enrolled in Industrial Doctoral Programme.

After these first seminars the local strategy will try to set a list of companies with real interest in the promotion of PhD studies together Academia side. Based on this first approach, the main goal will be the preparation of a winner proposal with tentative

candidates for the Industrial Doctoral Programme. However, the empower of PhD students developing PhD lines aligned with the Business Sector has not been limited to co-funded formulas. PhD Scholarships funded fully by companies should be other goal to promote with the seminars. This point shows crucial points because it is difficult to convince to the companies an investment for a short-medium term. In fact, the level of return on investment in the companies cannot be immediately measured and the benefits will be collected after the first years.

### 3.5 First Seminar

In the framework of PhD Hub project, the University of Alcalá and ADVANTICSYS have organized the first seminar to approach Business and Academia environment last 18th of September. The event was co-organized with University-Enterprise Foundation (<https://fundacionuniversidadempresa.es/en/>) and the audience reached up 30 people. The audience came from companies (12), Local and National Research Agencies (3), Universities (9) and foundations (5).

Concerning the profile of companies into the event, most of them are related to technology developments. Several fields were covered by these companies such as chemistry, bioengineering or pharmaceutical area.

The event was divided in two sessions: the first one was oriented to the dissemination of Regional and National grants for the implementation of Industrial Doctorate and the tax reductions for hiring young PhDs. The session was conducted by UAH and members of Madrid Regional Government and the National Agency of Research presented the different programmes. The session contained an interesting debate with the audience to address different issues. The second one was conducted by Advanticsys and the type of session was focused on a Panel with successful cases of benefited companies from National/Regional opportunities. The companies could be categorized like SMEs with a Bioengineering profile and the other with Informatics one. They explained the different experiences of PhD candidates and young PhDs.

### 3.6. Description of regional and National Grants for PhD Candidates and young PhDs.

The Spanish public administrations are promoting the effective collaboration and transfer of knowledge between the academic world and the corporate world upon the agreement to develop Industrial Doctorates.

The main goals are:

- Encouraging the recruitment of young researchers to develop research projects in companies that offer them a contract while allowing them to obtain an Industrial Doctorate
- Enable professional incorporation of these young PhD to the companies once they have completed their grant therefore broadening the scope for new R&D lines inside the companies.
- Strengthen the research lines and the competitiveness of the companies in the country to develop industrial projects together with the Universities, Public Research Organizations or hospital foundations

The requirements for prospective candidates are the following:

- To have been admitted (even with a conditional pre-admission) at the date of signature of the contract.
- Not having a working relationship with the company or with any other company related to it in the previous 12 months.
- Not having sufficient share in the capital of the company to take effective control of it.
- Not having obtained a similar grant for more than 12 months.
- Not having another PhD degree.

The obligations for beneficiary companies are the following:

- To sign in time the employment contract and ensure the proper development of the thesis R&D activities. The contract has a minimum salary quantity but it can be greater if is agreed by both parts (PhD candidate and company).
- To designate from the staff of the company, a tutor with the degree of doctor assigned as the thesis supervisor by the academic committee of the doctoral program.
- To facilitate the publication of the research results within the framework of the doctoral thesis.
- The rights of industrial and intellectual property will remain in the company.

The duration of the grant is minimum 3 years up to 4 years if the PhD thesis is not defended yet. In Madrid region, there are similar grants with almost equal requirements. In this case, it is not mandatory that company's tutor should hold a doctorate degree; however, s/he should be a relevant professional in the particular research field of the thesis.

The grants for the companies are different depending on the size. For example, for a small enterprise the grants are up to 20.000 €/year while for large enterprises it only goes up to 15.000 €/year.

Additionally, the Doctoral Programme will receive some funding, to motivate the generation of this kind of PhD in the academic environment:

- Cost of the doctoral student's enrollment in the doctoral program (up to € 2,000 / year)
- Recruitment of pre-doctoral or postdoctoral personnel or support for research
- Acquisition of equipment (up to € 30,000 / 3 years)
- PhD student travel and per-diem costs (up to € 6,000 / 3 years)
- Other expenses such as dissemination activities; expenses derived from the protection of intellectual property rights; patent applications, etc.

### **3.7. Main conclusions after the first workshop**

From the questions discussed along the different presentations and the final discussion, it might be concluded that the Industrial Doctorate in Spain, and particularly in Madrid region, requires more dissemination concerning not only the grants and fundings obtained, but also the interest of having more PhD employees inside the company.

Surprisingly, the companies that have obtained awards to have a doctorate employee would not develop the PhD degree if the costs were to be paid by the company solely. It might be of interest to promote the PhD employment to have more discussion and communication of successful cases where a PhD employee has been of large benefit for a company. The key idea is to put in value the doctorate contract in companies of different sectors. Not all companies are eligible, only those with a portfolio of products that requires some periodic innovation are the target for these PhD grants and Phd contracts.

There are other instruments to promote the PhD contracts in the industry (e.g. Torres Quevedo). These 3-year grants try to promote the transfer of knowledge from the Academia to the companies or technology institutions to develop in the hosting entity a clear project to improve or create new products or valuable tools. In general terms, there are different funding instrument to establish this productive collaboration between the Academia and the industry sector. Nevertheless, it is still necessary to carry out actions to persuade the people who make that kind of decision in the company that to take part of a PhD programme is quite beneficial in the long term for the company with or without public economic support.

### **3.8. Local Activities - Strategies**

The support of the regional government, as well as, associations linked to HEI and industry sector (e.g. Madrid, CEIM, Chamber of Commerce, etc.) are essential for the promotion of the Industrial Doctorates, since they have a large scope among companies in their closest

environment. It is important to arrange regular meetings and draw up a joint plan between the academia and these institutions. In the same way, it is an essential piece to get the support of city councils and local business associations to be able to show the benefits of being part of this programme to these potential participants.

For this, the following activities are proposed:

- To create an informative brochure, explaining what are the main aspects of the Industrial Doctorate and what are the benefits of participating in it. It should include a section on tax benefits. The hiring of personnel dedicated to R&D activities also implies a reduction of taxes in the Spanish context. In general, SMEs are unaware of the advantages of investing on R&D, that is why it is significant to encourage participation in Industrial Doctorates. These have specific requirements, but very interesting for companies.
- To plan different mailing activities, which can be done directly by business associations, including this brochure and other actions. For this reason, their collaboration and involvement is essential.
- To arrange sector meetings through small business associations: face to face meetings are more effective and successful. Therefore, it would be useful to plan a calendar meeting with each sector that could be susceptible of being interested in this programme.
- To develop a communication campaign. This could comprise activities, such as, to include articles in the local/regional association magazine or specialized journals; to create a monthly/quarterly newsletter; to tell successful cases of PhD students and companies, and other information of interest; to interview the CEOs of the companies that had participated in the plan; to create a section on the PhD Hub or universities website with the logos of the companies that are participating in the Industrial Doctorates; to create a prize for the best industrial thesis in collaboration with the city councils, business associations and universities.

## 4. Use of PhD results in the industry sector

The current PhD regulation establishes a common framework for the development of doctorate studies in Spain. Based on this context, each University must set a Doctoral School as minimum that regulates the access conditions and different ways to develop the PhD study (Join/Double PhDs, Industrial PhDs, part-time, etc.). Focusing on the Industrial PhD or PhD developed with the support of companies, the main concern is related to the regulation of Intellectual Properties (IPs) and PhD Supervisor into the enterprise. Concerning the IPs, Doctoral Schools have flexibility to address this point in the most convenient way for Universities and business. The regulation related to the Company, PhD supervisor has also flexibility to open the opportunity for PhD staff in the company with a provable research career.

In the national or regional context, there are not specific regulations to impede the use of

PhD results in industry sector. The agreements regarding the doctoral student's results are regulated in the contract and in the specific non-disclosure agreements in each case. This avoids many problems during the development of PhD student training period. Companies usually demand the greatest protection for the results and do not allow their publication in scientific journals, for example. Perhaps because the doctorate student needs, occasionally, prior knowledge from the company to carry out his/her project or the potential results (thesis) could be protected and commercialized. Sometimes this can be a challenge for the three actors involved: the PhD student, industrial supervisor and the academic one.

In this emerging context, the number of PhD staff working in companies is low if we compare it to Master or Bachelor degrees. Maybe, one of the reasons is that doctorate studies have been associate to the Academia career, rather than the industrial one. However, PhD graduates from technological fields are finding interesting opportunities in companies where their knowledge acquired in the PhD stage is being well appreciated. Companies are looking for doctorates as qualified staff for specific research topics. The profile of these companies is mainly Large Enterprises with a huge experience in International projects with multidisciplinary teams.

The National and Regional governments in Spain have developed specific programmes to help to connect those synergies from the Academia and the Business sector in both directions. Some of those programmes are focusing on human resources funding as it is, for example, to help to hire PhD graduates in the company or to carry out an Industrial Doctorate. Through these kind of calls companies have remarkable benefits, not only in economic terms, but also in quality ones, but in many cases they do not know it. Mainly, they can recruit high skilled students to increase their R&D and innovation capacity. This will provide them an important competitive advantage. PhD students are also a mechanism to link a quality collaboration with multidisciplinary research groups from the universities or research centres with companies from specific sectors.

Probably students are the other sector with more benefits. The possibility to develop a PhD aligned with the company real needs and interests will open new job opportunities in strategic areas for enterprises. R&D should be one of the most important investment for the companies in order to aware the sustainability in the market for a long time. Due to this matter, it is necessary to promote PhD programmes to push this field.

The enhancement of the PhD Dissemination and the tentative benefits for companies and for the society is a mission to be executed by several stakeholders. Regional policy makers are empowering the PhD needs in our society through several co-funding initiatives. However, it is not enough. A big effort from them must be done in order to promote these studies among the companies and society. Different successful cases should be taken as good practices in order to disseminate some examples of PhD collaboration between

Academia and Business.

As a final consideration, the public and private sector should work together to regulate how to transfer or disseminate the knowledge generated in the framework of the Industrial Doctorate in Spain. The main goals from the Academia and the Business should be articulated in a similar direction in order to protect both interests. Productivity in both sectors are measured in different ways, while IPs, such as patents, are a security tool for companies, but it could be an impediment for universities. A lack of agreement and criteria could cause companies to reject the participation in the Industrial Doctorate or vice versa.

## PhD Hub

There is a lack of interest for PhD studies in our postgraduate students. In order to determinate the causes; there is not only one reason for this situation. Analyzing which factors can influence on this, we can conclude that maybe one of the main causes is the lack of recognition, not only in economic terms, but also in quality from companies and society of PhD graduates. Due to that, any new initiative to promote the PhD studies and the benefits for the different involved stakeholders and the society is absolutely necessary. Local PhD Hub must be a way to approach the Academia and Business sector working together in the enhancement of PhD lines and students. If the different stakeholders are able to understand the needs of the business and/or society and the regulation of PhD, the approach between both sides could be possible.

## 5. Ideas for the local PhD Hub website

The aim of this section is two fold:

1. to give some ideas on how the functionalities of the platform may be enlarged to the university-business cooperation.
2. to provide a brief outline of the local PhD Hub strategy for the Spanish case

In doing so, some items are proposed below that provide the implementation of a clear strategy for what is defined in the project as a local PhD Hub (in this case, local meaning national).

Several functionalities to promote university-business cooperation are listed:

- To include non-profit organizations, NGOs, should be of large interest to spread the idea

- To serve as a showcase where to post all academic job openings at non-profit research institutes, universities and public centres.
- To promote PhD positions, research and post-doctoral positions and job openings for assistant, associate and full professors.
- Include jobs in the corporate sector that demand talented researchers.
- the information should be published in several languages (spanish and english) as there are job openings that specifically solicit foreign applicants.

There is, of course, an open question on how the platform may attract the attention/cooperation of some leading firms in the corporate market.

One key aspect is that the offerings must be easy to post and easy to find and apply.

Besides this, and perhaps more importantly than just opening the platform to job offers from the corporate sector is the contact and support with the national network on **Research in Spain** that in parallel may boost some ideas towards defining the best strategy for the national hub.

Together with the proper functionalities according to their goals, the platform might include a blogger section named as “**PHD Talks**”. These posts would be sponsored (the fundings and sustainability in the future of the local hub should be later revisited). The contents of this talks are aimed at those of anyone who might be toying with the idea of coming to Spain for an academic position, or who are thinking of starting a career in science in Spain by applying to one of the PhD programs and offerings shown. The subject topics may range from tips concerning actual research to which are the career opportunities after the PhD.

Another idea is to enable the platform to connect PhD Degree seekers with other initiatives through which recent PhDs may find some help to get started with the project, and other universities having similar initiatives, for example startups, entrepreneurship, skilled talented people associations, etc.

The platform should also provide open-source tutorials about Career Management.

The local hub should be formatted primarily for mobile devices and at a later stage provide a downloadable app with more capabilities such as geolocation of firms requiring PhDs, etc.

The website should clearly state the advantages about why *choosing a career in Spanish research and academia* is a good choice.

The portal should provide more information about Spain and what a candidate may have to arrange if they are planning to move to Spain. The following image taken from (<https://factcards.nl/>) is an example of the relevant information to expose:



Putting together this information is especially interesting for international visitors looking for a job in research and academia.

# Birmingham Hub strategy

## How to roll out the European PhD Hub vision

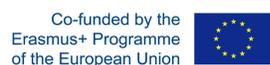
### European PhD Hub

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## 1. Executive Summary

Research is a core component of what we do at Birmingham City University (BCU) and we are well respected for our practical research with real world applications leading innovation and enterprise in industry, government and the professions. Our researchers are committed to discovering new knowledge and delivering real benefit to culture, industry, society and the environment. Our dynamic research community works across disciplines and with external companies to address local, national and global challenges to Architecture, Built Environment and Planning, Art and Design, Business and Management, Computing, Education, Engineering, English, Health and Sport, Law, Media and Cultural Studies, Music and Performance and Social Sciences. Our research centres include our research staff, research students and collaborators and partners (or research users). Our research centres work across disciplines to address key local, national and global challenges, in line with the priorities of the University and our students.

Postgraduate Research (PGR) students are the lifeblood of our research community and we support them in all the subject areas through our network of research centres. After completing their studies, many go on to become academics in universities, or researchers in industry, business and the public sector, ensuring that the country can sustain a vibrant knowledge-based economy.

We believe that industry is a key stakeholder in Higher Education and will increasingly have a say in the future of the University sector. We argue that industry can legitimately consider education as part of the supply chain, with the potential to improve industry competitive advantage. We consult with our industry partners to ensure that our courses are providing the right blend of technical, cultural and personal skills that help to ensure industry is receiving the graduates it needs and that our graduates enter the job market with the correct training. We work closely with professional bodies on a variety of activities such as PhD studentship agreements, knowledge transfer partnerships (KTPs), student placements as well as to offer relevant and industry-driven staff training courses for businesses and organisations.

To manage all these different involved communities, the Doctoral Research College (DRC) is a non-academic department within BCU whose primary purpose is to 'Enable Excellent Research'. The DRC will do this by working in partnership with all stakeholders (such as PGR students, Faculty research colleagues, other professional service groups within the University, and external colleagues, external examiners / supervisors, etc.) The DRC is an integral, fundamental part of the Research Office (which oversees the wider research provision / development within the University using the Research Development & Support and Research Information & Funding Functions) and DRC staff are embedded within each Faculty, with staff also based within the central Research Office. Besides, the PGRNet is the Postgraduate Research Network at the University, and it works hard to

improve postgraduate experience and represent postgraduate research students at Research Committee<sup>1</sup> level, holding regular events and workshops for our PGR community.

## 2. Overview of Local Environment in Birmingham

Knowledge Transfer Partnerships (KTP) is a UK-wide programme which encourages businesses to improve their competitiveness, productivity and performance through partnership with an academic institution (such as a university, further education college or research and technology organisation). Through the programme, a business can recruit a recently qualified graduate (known as the Associate) to work on a project for either 10-40 weeks or one-three years. So far, KTPs have helped businesses to design new products, examine business models and improve manufacturing processes.

KTPs have benefited businesses both large and small, including third sector and public sector organisations, across many industries. Because the Associate's wages are part-funded by government grants, these partnerships can be extremely cost-effective. The Faculty of Computing, Engineering and the Build Environment has already collaborated on more than twenty KTPs. Many of our graduates have been successful in developing new products – and increasing profits – at companies such as the Morgan Motor Company, Mechatherm International Ltd and Hydrapower Dynamics (Birmingham).

Within the Region, the Knowledge Innovation Technology Transfer Scheme (KITTS) is a West Midlands programme where 10 partner universities work together to match small- and medium-sized local businesses with high calibre graduates for three-month paid work placements. It's an affordable, easy way to recruit highly educated staff to inject fresh thinking into your projects. For the graduates, it's a chance to put theory into practice and to get valuable experience.

The Knowledge Exchange and Enterprise Network (KEEN) is a business improvement programme, part-funded by ERDF, and designed specifically to help West Midlands based SME's increase their profitability and achieve growth through working with a regional university. By working with BCU the business will gain:

- A graduate (known as an Affiliate) who will be recruited to work full-time on a bespoke project within your business.
- Continuing support from a nominated university liaison officer.
- Ongoing mentoring and support from university experts for the Affiliate to ensure that project objectives are met.
- Access to the university's resources, including facilities and expertise.

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<sup>1</sup> Precisely, BCU's Research Committee and its 3 sub-committees are Research Environment and Training Committee, Research Operation and Strategy Committee, and Research Ethics, Governance and Compliance Committee.

- Access to an equipment and travel budget (worth on average £4,000).

Moreover, the AHRC-funded Midlands4Cities Doctoral Training Partnership (M4C) brings together eight leading universities across the Midlands to support the professional and personal development of the next generation of arts and humanities doctoral researchers. M4C provides:

- Studentship funding and enhanced support for professional training.
- Expert supervision within and across our dynamic mix of university partners.
- Networking and collaboration across the Midlands, nationally and internationally.
- Links to leading cultural organisations and creative economy partners.

There are also Collaborative Doctoral Awards (CDAs) available with pre-defined projects which involve collaboration with a local cultural institution.

### 3. Analysis of Science-Business Cooperation

BCU is a dynamic research force within the UK higher education sector and is committed to continuing growth in research excellence, new knowledge generation and knowledge exchange. We are passionate about working with partners: many of our research staff are also practitioners with a professional interest in solving industry problems. Working with partners is particularly valuable for our students, giving them real experience and showing them the latest, most up-to-date industry thinking and practices. Our research centres and platforms create opportunities for sharing, collaboration and guidance for individual researchers. We work collaboratively with business, industry and academic partners to develop 'real world' applied solutions. The primary focus of our research is driven by our academic staff, students, local/national/global challenges and our curriculum. Since 2001 the breadth, diversity and quality of our research has improved significantly. The results of RAE 2008 and REF 2014 demonstrated this marked improvement with almost one fifth of our submission judged 4\* ('world leading') and three-quarters judged of internationally recognised quality. This demonstrates the progression of our research, and brings us a closer to achieving our objective of being nationally recognised as a research-engaged University by 2020.

We have already partnered with Birmingham City Council in many occasions and with several high profile local and national businesses and organisations, including Network Rail, Mitchells & Butlers and Marston's, Cisco Systems, Rolls-Royce, to name a few. We also support school students, encouraging them to pursue higher education and careers in the construction industry. Recently, formed in the context of a changing Europe and a growing regional renaissance in the UK's West Midlands, BCU and the Fraunhofer Society have announced a strategic partnership to deliver a new model of research innovation. A Memorandum of Understanding between the UK university and German organisation was signed on Wednesday 17 August 2018, which will see the partners work together to advance

their relationship in international research cooperation, technology and innovation transfer, commercialisation and training across a range of sectors. Building on BCU's extensive engagement with business and well-established track record of collaborative working, the partnership will leverage Fraunhofer's expertise in technology transfer and commercialisation, the development of creative spaces and applied research.

This groundbreaking initiative builds on the recent development of a number of significant projects where BCU is playing a leading role, including STEAMHouse, the Birmingham Knowledge Hub, the newly formed West Midlands Combined Universities (WMCU) and the launch of the six-strong Midlands Enterprise Universities. In particular, the STEAMHouse has been created in partnership with Eastside Projects, and is funded by the European Regional Development Fund and Arts Council England. STEAMhouse drives innovation and research to create business solutions that fuel long-term economic growth. Conceived as a collaborative innovation centre, the STEAMHouse focused on solving the challenges facing SMEs in the West Midlands region. In the first phase, the project housed on Digbeth High Street is enabling businesses to develop innovative ideas and creative products in a collaborative setting. The building will have specially designed spaces to encourage businesses to incubate new ideas, and prototype new creative products and services. It will also house a new fabrication facility focusing on experimenting with digital, wood, metal and print production. The project will engage with at least 200 SMEs in the Greater Birmingham, Solihull Local Enterprise Partnership (GBS LEP) area over a three-year period. During the second phase of the STEAMhouse project, £22.2 million will be invested in a large-scale collaborative centre made up of mixed incubation, collaboration and maker space in the heart of Birmingham. A new STEAMhouse education facility called STEAMacademy will create interdisciplinary courses with industry input to drive talent.

Furthermore, the Knowledge Hub (K-Hub) is a pioneering master-plan that will transform both the way we think about, create and develop our public spaces. The way in which we use these spaces to power collaborative thinking, connecting deep science with start-up energy and focus, will harness existing urban spaces with newly designed areas creating a cohesive campus concept. To this end, K-Hub will be a beacon of new place-based innovation, leveraging the benefits delivered by the HS2 Growth Strategy, Industrial Strategy and Big City Plan to drive economic growth. This will be facilitated through targeted intervention packages and by linking innovations to overseas markets and investors. Covering both Birmingham and the wider West Midlands region, K-Hub will capitalise on investment, supporting the development of a rich innovation environment. Practically, the initiative will help develop new products/services, create jobs, grow business opportunity, increase productivity, and foster vital research. K-Hub is led by Birmingham City University and underpinned by a network of partners, including Aston University, Birmingham City Council, BMet, Innovation Birmingham, HS2, Phillips Lighting, BOA and HS2 College, amongst others.

On the other hand, there are a range of placement opportunities open to BCU's students. Over the last few years our students have undertaken sandwich year placements in a variety of roles related to their degree, with both small local companies and international organisations. We pride ourselves on the quality of the placements our students undertake and the level of professional development offered by a year in industry. Our students have

gone on placement to companies including: Cisco Systems, IBM, Griffiths Waite, eTech Solutions, Tata Motors, Accenture, Atos, Interactive Intelligence, EDF Energy, Jaguar Land Rover, Juniper Networks, Cheshire Police, Dudley Council, Caterpillar and Porsche, BMW, Bosch, Disney, Enterprise Rent-A-Car, Good Year Dunlop, Hilton, Mattel, NHS, Siemens, Tata Steel and Tetley, among others.

BCU is also an accredited vendor certification centre, allowing students to sit the vendor certification exam required to become a full Cisco Certified Network Associate. In fact, BCU has been a member of the Cisco Networking Academy Program since 1998. Formally the UK's CATC, we provided instructor training and academy support across the UK to some 130 academies at the peak. From the launch of CCNP in 2001, BCU was also the CATC for the CCNP Program within EMEA and has provided CCNP instructor training across Europe, Russia, Israel, Dubai and South Africa.

## 4. Use of PhD results in Industry Sector

Birmingham is a hub of scientific activity, where consultants like to work with those who have gained a Masters or PhD in a specific scientific discipline. Alliances between universities in the Region and other bodies such as city councils and incubators bring in fruitful collaborative projects in advanced materials, energy and transnational medicine, to name a few. For instance, Birmingham Science City

In BCU, a key aim of our PhD programmes is to supply a stream of industry-ready, world-class engineers and scientists.

Industrial Doctorate is an alternative to the traditional PhD for students who want a career in industry. A four-year programme combines PhD-level research projects with taught courses, and students spend about 75 per cent of their time working directly with a company.

BCU has also experience in PhD co-supervision and post-graduate studentship agreements with businesses. Entering into these types of agreements, the Parties acknowledge that the terms governing the funding and conduct of a studentship, to enable the Student to carry out a research project and submit a related thesis for examination in accordance with the University's regulations governing post-graduate study in fulfilment of the requirements of a higher degree of the University. The Parties also need to acknowledge that the research is intended to lead to academic publications relating to the results of the studentship in furtherance of the Student's career. Moreover, the Parties should acknowledge that in the course of the studentship the Parties may be exposed to proprietary and commercially valuable information or materials of the Company and/or the University. All Parties recognise the importance of holding in confidence such information or materials.

We now present some of the PhD successes in collaboration with the industry sector in the following case studies:

Funded through Interreg IVB's Strategic Initiatives Programme, *Energetic Algae (EnAlgae)* is a four year project which combines the expertise and resources of 19 partners over seven countries in order to address sustainable pathways for Algal Bioenergy. The funded project with a budget of over €14.5 million has an overall aim to reduce carbon emissions and dependency on unsustainable energy sources in the North West European member states. It will be achieved through accelerating the development and use of algal-based biomass, bioenergy and GHG mitigation and bioremediation technologies from pilot phase to application and out to the market.

BCU has been working as a supplier for research with the *Aerospace Division of Rolls-Royce* since 2008, on a project examining its advanced engineering systems. The relationship began with an initial twelve-month Knowledge Based Partnership (KBP), within the University's School of Engineering, Design and Manufacturing Systems which focused on modelling Rolls-Royce's advanced engineering systems to provide better understanding and intelligence on key engineering systems. Key grants result from this collaboration are

2009-10: Knowledge based partnership, funded by Technology Strategy Board (TSB).

PI: Craig Chapman and Maria Nicastrì (Research Associate). Value: £55K

2010-13: Strategic Investment in Low Carbon Engine Technology (SILOET) programme funded by TSB. PI: Craig Chapman. Value: 190K

2013-15: Strategic Investment in Low Carbon Engine Technology 2 (SILOET2) programme funded by TSB. PI: Craig Chapman. Value: 150K

2012-12: Hub casting knowledge fusion modelling, funded by Rolls-Royce. PI: Craig Chapman and Pathmeswaran Raju. Value: £26.5K.

PhD Grants:

2012-15: "Model & Evaluate Technologies in Virtual Products" and "Computational methods for forging geometry of aero engine discs", funded by Rolls-Royce. PI: Craig Chapman. Value: £15K.

In summary, university-business cooperation at PhD level in the Region brings interesting benefits for all parties but specially for the student who will count on expert staff supervisors as well as on excellent links with industry, both to support their research and career progression. Besides, their research will be grounded in cross-discipline areas benefiting from a range of specialist labs/workshops, software, facilities and working environments tailored to specific project needs.

## 5. Birmingham Hub strategy

### 5.1. Mission and Objectives

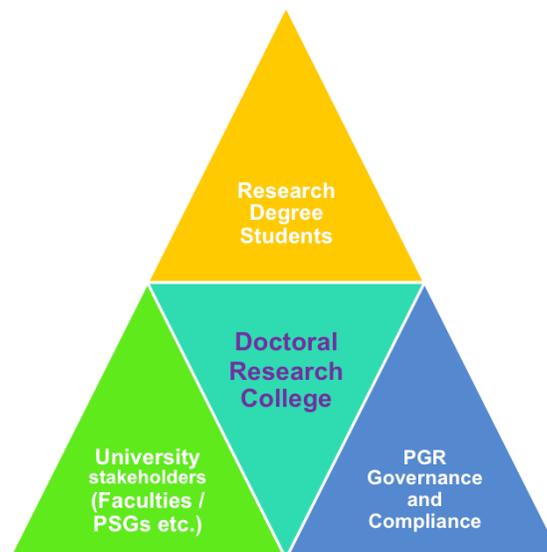
Mission statement for the local PhD Hub at BCU is as follows:

- To support PhD researchers and promote their research at both national and international scale;
- To encourage and enhance researcher development and skills for employment by linking the researcher to national and international industrial bodies as well as academics across the European PhD Hub net;
- To encourage and support the development of supervisory practice towards the active cooperation with the industry and challenges of impact;
- To provide useful and relevant materials such as templates and access to content as well as interdisciplinary conferences and events for students and supervisors;

Key in managing the heterogeneous stakeholders around the PhD Hub at BCU is the Doctoral Research College, the Studentship agreement with industrial partners and other communication media. These are the engines running our strategy.

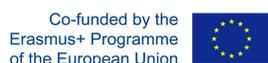
### 5.2. The Doctoral Research College

The DRC develops and maintains working relationships with the above stakeholders to promote the needs and requirements of the University's PGR collective and to ensure that they are appropriately represented in function development and service delivery.



**Figure Doctoral Research College**

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The Internal University Stakeholders and users of the DRC function may be listed as (but not limited to):

Faculties:	Professional Service Groups:
Associate Deans (Research).	Academic Services – Registry Services, Assessment and Awards, Client Services
PGR Supervisory team members (also some based external to BCU).	Student Affairs – Enablement & Wellbeing, Finance & Operations, Queries & Resolutions.
School / Department / Centre Leads for Research.	International Office – International Student Advisors. UKVI Compliance team (VCO).
Unit of Assessment Leads.	Library and Learning Resources.
Members of formal committees – Research Committee and its 3 sub-committees	IT Services.
PG Cert Research Practice delivery teams	Marketing and Communications.
PGR Supervisor Community of Practice leads	Students' Union.
Professional Doctorate delivery teams	Finance - Collections and Payment

The DRC oversees all processes which support PPGR students during their studies, including: enquiries, admissions and enrolment, advice on Scholarships/Fees/stipend payments/contracts, registration and induction, attendance monitoring and progression/Annual Monitoring, PG Certificate Research Practice (and other research training), suspensions/extensions, PGR support/Drop-in sessions and Thesis submission/Examination/ Awards.

### 5.3. BCU Studentship Agreement

Our PhD degrees may use industry experts to support some projects, and others may be run in full collaboration with an industry partner. In these cases, an Agreement is made between the university and the industry partner whereas

- (A) The Parties wish to enter into this Agreement in order to record their collaboration on a post-graduate studentship.
- (B) The Parties acknowledge that the terms of this Agreement are to govern the funding and conduct of a studentship, to enable the Student to carry out a research project and submit a related thesis for examination in accordance with the University's regulations governing post-graduate study in fulfilment

of the requirements of a higher degree of the University. The Parties further acknowledge that the research is intended to lead to academic publications relating to the results of the studentship in furtherance of the Student's career.

- (C) The Parties further acknowledge that in the course of the studentship the Parties may be exposed to proprietary and commercially valuable information or materials of the Company and/or the University. All Parties recognise the importance of holding in confidence such information or materials.

In this Agreement, project aim, objectives, duration, supervisors, materials and facilities, funding, and publications, confidentiality and intellectual property terms and conditions are clearly stated amongst other legal clauses.

## 5.4. Communication media

Our local PhD Hub benefits from a series of communication mechanisms and activities such as:

- *The Birmingham City University's Research Blog*<sup>2</sup>, where postgraduate researchers offer a glimpse into their research while providing valuable advice on future career options, balancing studies with work and social life, and the PhD process.
- *Research Seminars* are running fortnightly displaying a tutorial/keynote by both senior and young academic staff members.
- The European PhD Hub platform is planned to be helpful at both scales, local and international research arrangements.

## 5.5. Business Breakfast events

A series of periodic events and seminars are planned with the local business within Birmingham PhD Hub. They were coined *PhD Hub Business Breakfast* and target the coordination of the local university-business cooperation and further communication of events and news while degustating a buffet breakfast.

A first event took place on FRIDAY 22nd March 2019 8:00AM-11:00AM at iCentrum, Innovation Birmingham Campus, Holt Street, Birmingham B7 4BP with title “Catapulting STEAM Research and Innovation. PhD Hub Business Breakfast”. Objectives of this first seminar were:

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<sup>2</sup> This blog is run by Birmingham City University's Research Office, part of Research, Innovation and Enterprise. <http://blogs.bcu.ac.uk/research/category/cebe/> (Last access November 2018)

- to jointly establish our local PhD Hub strategy. This strategy aims at representing the interest of both academic and corporate fields;
- to find a joint approach for triggering research and ensuring its transferability to the society at large;
- to identify complementary and alternative funding sources; and
- to explore opportunities for internationalising our doctoral training so contributing to a single European area for research, education and financing.

First event in March 2019 followed the agenda below:

- 8.30 *Welcome - Enabling Business-University Cooperation*  
CEBE Doctoral Research College  
Professor Cham Athwal  
Associate Dean Research and Enterprise
- Birmingham PhD Hub*  
Rehan Bhana  
Associate Professor (Strategic Alliances)
- 8.50 *Open Industrial challenges and experiences*  
Industry partners - Microsoft
- 9:30 *International Research Opportunities*  
Dr Esther Palomar  
Reader in Cyber Security at BCU
- 9.45 *Funding Streams*  
Heike-Suchester-James  
Natalie Lewis / Shashank Hoshally  
CEBE Enterprise and Innovation
- 10:15 *Open Forum -*  
PhD Student

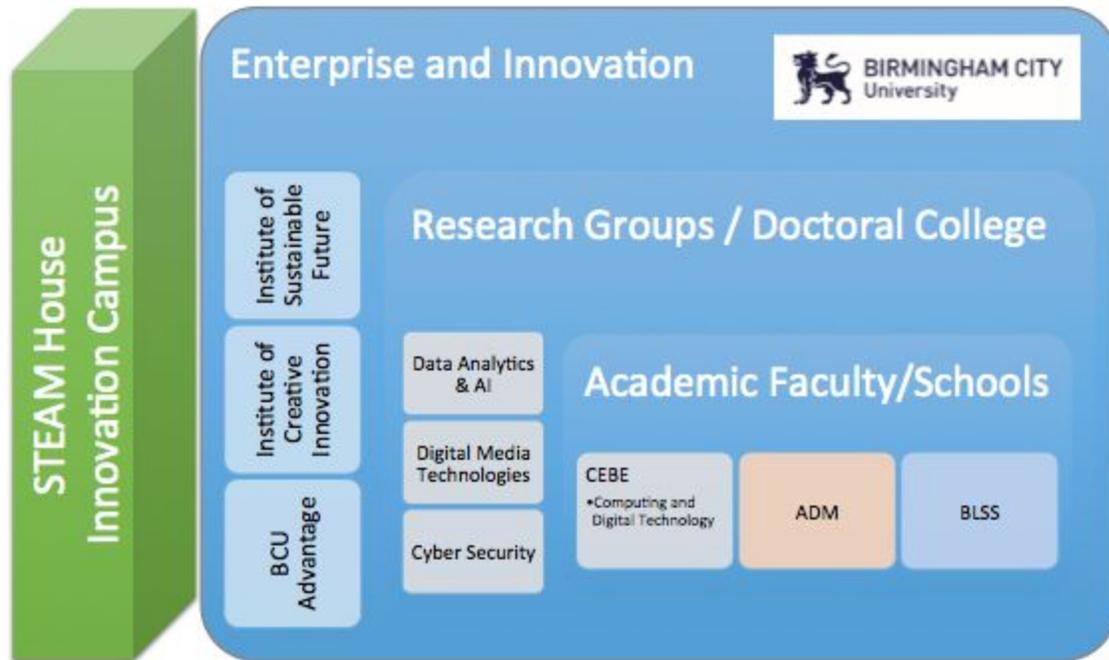
The event gathered together a number of 20-25 attendees from the local industry, academia and student communities. It was agreed that the basis of our local PhD Hub university-business cooperation is through the STEAM House<sup>3</sup> Birmingham and its alignment to the university functions, e.g. providing means for business engagement in mentoring of industry-led projects. In particular, the STEAMHouse can make arrangements for:

- One-to-one tailored support from industry experts, including everything from business planning and skills development, to finance and marketing.
- Cutting edge print, digital, metal and wood workshops, with skilled technicians on-hand to help you produce prototypes and products.

<sup>3</sup> The STEAMHOUSE <https://www.steamhouse.org.uk>

Created in partnership with Eastside Projects and funded by the European Regional Development Fund and Arts Council England, it is driving innovation and research for major long-term growth across the region. Bringing inventors, entrepreneurs, businesses and craftspeople together to develop exciting new ideas and products.

**Strategic Structure for enabling Business-University Cooperation for Birmingham**



**Figure Structure for Business-BCU cooperation**

- Innovation labs and collaborative idea development to foster the brightest new STEAM thinking.
- Research collaborations with top academics.
- The opportunity to receive a grant of up to £2,500 to make and commercialise your idea.
- An inspiring public programme of talks and workshops.

## 6. Key Conclusions

BCU counts on an important track record in encouraging the local industry (and other big players like Cisco or SAP) implication in our education at BSc and MSc level. It is not the first attempt at PhD level, though it is always challenging the coordination of student, faculty and business's wills, obligations and rights. Sponsorships or scholarships from industry is sometime result from years of grant and funding seeking by university academic members and researchers. In fact, research projects and grant applications are the main and most common sources to support this university-business cooperation at PhD level in current time. The European PhD Hub aims to facilitate this task by easily linking the 3 roles (i.e., university, industry partner and student) towards a common interest or passion. Here is the challenge; the linkability of these 3 around that passion. The rest is mere procedure and agreement.

# Lodz Hub strategy

## How to roll out the European PhD Hub vision

### European PhD Hub

#### Authors:

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## 1. Introduction

The University of Lodz (UL) is an example of an organization that provides various forms of cooperation with the business environment. This work names main areas of cooperation between the UL and its business ecosystem. Cooperation can be identified both on the level of the whole University, as well as its departments. This division is justified by university enterprises, and by much more specialized forms of cooperation. In the context of management specialization and cooperation with companies in this scope, enterprises carried out by the Management Faculty of the University of Lodz will be named. It should be stressed that the accepted forms of cooperation with the business environment both on the University level, as well as on the level of particular faculties, are accordant with the University of Lodz strategy. Particularly, what should be stressed is the accordance of the cooperation of the University and business environment, with such Values of the University of Lodz as Community, Open-Mindedness, Freedom, Innovativeness, Responsibility, variability and tolerance, Expertise and progressiveness.

The Strategy of the University of Lodz says, among other things: “The effects of our research should benefit the country, the people and the economy. Therefore, we will share those effects with everyone naturally connected with us: with entrepreneurs, local authorities, academia, and institutions of culture and art. We intend to cooperate even closer with our environment, to be able to significantly contribute to the development of our city, region and country”.

Stressing the significance of this cooperation now and in the future, is clearly visible. The strategy of scientific research emphasizes aims that directly relate to the cooperation with the environment. It concerns:

- increase in number of expertise works and analyses based on original research
- increase in number of scientific inventions based on basic and applied research

Assessment criteria of aim realization:

- quality and number of patents in total
- number of applications
- number of patents for 1 million of R&B funds
- increase of the level of research results

Assessment criteria of aim realization:

- supporting interdisciplinary research, including joint research with entrepreneurs

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- increasing the number of the University of Lodz scientists on apprenticeships in companies
- constant cooperation with local, national and international organizations in the field of expert analyses based on scientific research
- constant improvement of research infrastructure needed to conduct high quality, significant scientific research
- providing access to research infrastructure for entrepreneurs

Moreover, in relation to the offer of PhD studies, it is pointed, among others, to the ongoing improvement of the system that allows to constantly adapt the program to changing requirements of the job market and requirements for academic experts:

- creating programs of faculties in cooperation with business practice
- introducing application PhD carried out by an employee of a company or external institution that intends to implement research results from the PhD thesis

## 2. Lodz Hub strategy

The University of Lodz Center for External Relations is an example of the university initiative that encompasses coordination of UL cooperation with its socio-economic environment, stimulation of the cooperation, its launch and continuation. Creating projects related to stimulating entrepreneurial attitudes among students and employees of the University, dealing with, among other things, commercialization of UL research. Center for External Relations also helps employees and students to consciously plan their careers. Career monitoring of our graduates is also an important element.

Following forms of cooperation function within the Center for External Relations:  
RELATIONS WITH GRADUATES

- The Graduate Club of University of Lodz
- VIP Graduate Program
- The UL Graduate Card
- Monitoring of University graduates' careers

COOPERATION RELATING TO RESEARCH, DISSERTATIONS AND STUDY PROGRAMS

- Practical Diploma
- Research projects ordered by companies and carried out by university units
- Including business and companies in didactic processes
- Joint research or didactic projects (business +academia) financed from EU funds

COOPERATION WITH UNIVERSITY ENVIRONMENT

- Career Start with the University of Lodz

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- University of Lodz for Children

In particular, tasks carried out within the Center for External Relations of the UL, can be singled out:

1) initiating and sustaining a network of contacts and relations with the socio-economic environment of the University, including:

- coordination of information flow between the Center for External Relations and University Faculties, employers and units of public administration
- intermediating in contacts between students and the University, employers and institutions of the job market
- representing entities in contacts with media, public offices, companies and institutions of public administration
- overseeing the organisation of conferences and training events organized by the Center for Careers and Cooperation with Employers.

2) Coordinating activities of the Fund for Innovative Education of the University of Lodz, including, among others:

- keeping and updating the database of the Partners of Innovative Education of the University of Lodz
- keeping the register of agreements of the Partners of Innovative Education of the University of Lodz, and monitoring their proper realization
- keeping the register of invoices issued for the Partner of Innovative Education of the University of Lodz Certificates
- keeping a register of purchase form the article 4, point 8 of the Public Procurement Law.

3) supporting, initiating and developing ventures projects that aim to strengthen the connection between graduates and the University, such as the project University of Lodz “Graduate Card”, including, among others:

- acquiring partners and developing the discount program
- preparing agreements with project partners and monitoring of their proper realization; overseeing it the card regulations are followed
- coordination and control of the proper production and distribution of the cards
- regular communication with University’s graduates via webpage, newsletter and social media
- control of the content of the University of Lodz www, in the part concerning graduates.

4) Organisation, control of realization and systematic evaluation of the program “VIP Graduate”, including, among others:

- organization and promotion of the Expert Lectures, delivered by VIP Graduates

- coordination of recruitment and training of students and mentors participating in the mentoring program
- promotion of the mentoring program among students and employers;
- updating the program materials for the project
- running the [www.absolwent.uni.lodz.pl](http://www.absolwent.uni.lodz.pl) webpage.

As it can be seen the range of activities is very wide and influences cooperation of the University with the business environment both directly and indirectly.

Another example of a unit operating within the University is the Technology Transfer Center of the UL, as a progressive unit of the University of Lodz, which was opened in December 2003 within the American-Polish “offset” program, and coordinates undertakings concerning innovative ideas in the scientific, business and public environments, both on national and international level by running educational, training, scientific and consulting services. Those activities are carried out, as a part of activities related to commercialization of science and technology. Moreover, the activities of the CTT in the field of science and technology transfer, and of innovative ventures via University Technology Incubator, should be noticed.

The abovementioned cooperation of the CTT with the University of Lodz Incubator, shows synergy of activities in the sphere of cooperation and modelling of relations between University and its business environment. The University of Lodz Incubator provides consulting and training services and expertise for entrepreneurs. To access innovativeness and market potential it uses, among other tools, methods used by the University of Texas and the NASA. Via the network of experts from science and business, also from abroad, the Incubator helps design and successfully introduce businesses to the market. In particular, the Incubator supports business ideas, opening a business, implementation of research.

The offer of the University of Lodz Incubator is dedicated to:

- students and graduates
- PhD students and scientists
- other authors of business ideas

Provided support lets the beneficiaries: assess market chances of an idea or an invention, write a business plan, start a company, acquire financing – from investors, EU or StartMoney fund, prepare an application for EU funds, acquire a patent or another kind of protection in contacts with advisors and experts, promote the business and rent an office on preferable conditions. At the same time, business, technology and organizational consulting that is provided helps guide this innovative venture through early, critical phases of growth of a new business, or scientific or innovative project, as well as acquire funds, and successfully introduce the business to the market.

The next group of examples of forms of cooperation of the University with the business environment are projects carried out on particular faculties.

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One of the methods of activating the discussed cooperation is called the “Business Councils”.

Business Councils are present on every faculty of the University of Lodz since 2008. Members of the Councils are business leaders from the Lodz province. Basic aims of the Business Councils are:

- Cooperation with the UL Faculty of Management in the didactic process
- Exchange of the experiences between theoreticians and practitioners of management
- Support for and participation in students initiatives of the UL Faculty of Management
- Cooperation in the organisation of apprenticeships for best students of the Faculty of Management
- Acquiring the best students of the Faculty of Management for business
- Cooperation among members of the Business Council, including joint preparation with the Faculty of Management of consulting and training offer for the members of the Business Council.

The next examples of initiatives in this area are Graduate Galas. A Graduate Gala allows to officially sum up the entire period of studies and also provides and shows new opportunities for the graduates to continue cooperation of the University with graduates on academic and business grounds. For example, during the Graduate Gala, an offer is presented that includes postgraduate, PhD studies, educational projects, newsletter and the Graduate Card. Partners from Business Councils and other institutions providing awards for graduates for their scientific papers, in a form of paid internships and material awards, are active participants of the Gala.

Apart from the already mentioned projects, following Centers operate within the cooperation activities:

Knowbase Center for Quality of Research at the UL Faculty of Management

Polish-American Management Center

Center for International Studies on Accounting

Business Center

Faculty Development Center

Center for Methods of Organization and Management

Center for Safety Technologies in Logistics

Center for Research and Science Cooperation: Poland –Ukraine

Centre for Business Analysis

Center for Artificial Intelligence and Cyber-communication Studies

#### **Sources:**

<http://pracodawcy.uni.lodz.pl/o-nas/centrum-karier-i-wspolpracy-z-pracodawcami/>

<http://pracodawcy.uni.lodz.pl/wspolpraca-naukowa/>

<http://lodz.wyborcza.pl/lodz/7,154682,21954938,uniwersytet-lodzki-tu-nie-ma-rzeczy-niemozliwych.html>

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<http://www.ctt.uni.lodz.pl/>

[www.ciat.uni.lodz.pl](http://www.ciat.uni.lodz.pl)

<http://rb.wz.uni.lodz.pl/>

<https://studiapodyplomowe.uni.lodz.pl/>

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# Thessaloniki Hub strategy

## How to roll out the European PhD Hub vision

### European PhD Hub

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## 1. Executive summary

This document is produced to give an overview of the Thessaloniki Hub strategy. It presents the state of play of the Greek region regarding PhD studies and their limitations and opportunities. This recapitulative document informs the development of the Thessaloniki Hub strategy and supports its implementation.

## 2. Science-Business cooperation

The present state in Thessaloniki region regarding science and business cooperation comprises:

- Low level of cooperation between universities and business partners due to lack of established university-business networks.
- Low research level among universities due to lack of available funding
- Existing structures of placements regarding the engagement of BA students in business which are not accompanied by relevant structures in PhD level.
- Lack of a cohesive strategic plan regarding UBC. Private universities are still trying to establish their position within Greece's educational system, a fact which is of outmost importance for the evolution of UBC, as well as entrepreneurship and innovation within the educational system through benchmarking.
- Vague framework of labour market relevance of tertiary education in order to aid transition to business sector;
- Development of a series of initiatives for cultivating entrepreneurship and innovation among academics (staff & students) in order to facilitate the strengthening of knowledge triangle and face existing prejudices concerning education.

The most frequent forms of Science-Business Cooperation within Thessaloniki Region consist of:

- Placements of BA students in relevant associated business partners
- Business partners participate as guest lecturers or speakers in courses or workshops/seminars respectively, which occur within academic institutions.
- Certain and relatively few business partners facilitate part of a PhD research either by funding or by use of facilities. This collaboration is particularly applicable to engineering schools and more specifically to

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certain faculties (Chemical Engineering, Mechanical Engineering, Electrical Engineering, Computer Science)

Since there are not many forms of Science-Business Cooperation we cannot distinguish them according to their efficiency level. Using their frequency and their continuity, as qualitative efficiency indicators, we can ascertain that types 1 and 3, described above, are the most efficient forms of cooperation. It is also crucial to mention that these forms are distinct according to each faculty, and thus, it is evident that there is not a holistic strategic model for forming numerous such partnerships according to certain terms and conditions.

The existing barriers of effective & efficient cooperation for SBC comprise:

- Vague legal framework regarding tertiary education and its interaction/connection with the labour market.
- Widespread suspicion towards business partners and their objectives through exploitation of research results. Universities and businesses are considered competing counterparts rather than partners.
- Lack of established cohesive structures that facilitate SBC both in business and academic partners. Absence of a strategic plan for the promotion of knowledge transfer between counterparts, as well as skills mismatching and engagement of academic institutions in entrepreneurship and innovation.

Key Tasks for academia and business comprise of the following:

- Identification of the existing gap between academic institutions and businesses
- Development of a strategic plan for promoting SBC through certain initiatives and unambiguous goals
- Benchmarking; Overview of best practices within Europe concerning SBC and incorporation of the most relevant ones with respect to the specificities of Thessaloniki's academic environment, business competences and national legal framework
- Development of certain structures both within academic institutions and businesses that will enhance innovation and entrepreneurship among staff and students and will also facilitate the engagement of students in business sector from early stages but also during research.
- Overhaul of the curricula in universities' programmes which will be built upon a more business-oriented approach.

The main courses of action that local government should adopt are the following:

- Amendment of the legal framework regarding SBC; Projection of certain measures that will enhance this cooperation

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- Development and promotion of initiatives that will facilitate SBC and the familiarization of different counterparts and policy makers with innovation and entrepreneurship elements. This course of action entails examples of how HEIs and businesses cooperate to address societal challenges; how HEIs reach out to the community to solve the problems faced by its citizens and to stimulate social and cultural innovation as well as how this cooperation will facilitate regional development and the exploitation of the competitive business potentials of the region.

Entrepreneurs and Scientists act as “stimulants” of this Science-Business cooperation (SBC) due to the lack of these cohesive structures that would facilitate SBC regardless of any individual intervention. Through their contribution, the existing gap between academia & business will narrow through strengthening knowledge triangle.

The Main Research Fields that should be prioritized within the launch of the Hub are the ones that already operate within a framework which facilitates SBC. These are:

- Computer Science
- Agro-food
- Manufacturing and Materials Science
- Microbiology
- Biochemistry
- Energy
- Transport
- Product Development

### **3. Use of the PhD results in the industry sector**

The present use of PhD Hub results in the industry sector is considered rather low among businesses and is restricted mostly to engineering firms. The use of research results shall be widespread among industries and the cornerstone of achieving this objective is tackling the established suspicion towards business partners and their objectives through exploitation of research results. Available funding constitutes also a limitation to the exploitation of these results and the facilitation of knowledge transferability which shall be mutually beneficial to industries and academia.

The existing legal regulations are considered insufficient concerning the facilitation of the use of PhD results in the industry sector. In fact, we have already ascertain the absence of an updated legal framework which will entail

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specific guidelines for knowledge transferability, UBC and dynamic engagement of students, researchers and academic staff in industry sector.

We cannot argue that the existing legal regulations neither impede the use of PhD results in the industry sector nor they facilitate the exploitation of research outcomes from industries. As we have already mentioned, the existing legal framework is considered inadequate and has not provisioned universities and businesses with the essential tools and guidelines to develop a strategic plan for facilitating mutually beneficial knowledge transferability.

Regarding the existing financing system of R&D, although it is considered inadequate in terms of available funding, we can argue that there have been certain initiatives towards the direction of innovation and entrepreneurship and consequently the increase of funding opportunities for relevant research and development projects. These initiatives comprise the increase of share of available funding from national financial instruments to R&D as well as provided consulting services to various R&D stakeholders who aim to absorb EU funding.

As we have already stated above, the existing financing system of R&D does not impede use of PhD results in the industry sector and through certain initiatives either at local, national or European scale, there is an attempt to increase available funding towards R&D direction.

The development of a strategic plan for utilization of available funding on R&D, the development of certain policies which enhance UBC and motivate research, entrepreneurship, innovation and technology at a broader scale and the prioritization of R&D within central or local government objectives, are crucial measures to be addressed.

It is of utmost importance to raise awareness not only among businesses, universities or individuals but also among regional policy stakeholders, concerning the role of PhD results in development of industry sector. Although there have been developed certain initiatives towards R&D sector and its financing, no strategic plan has been designed for setting the framework under which each region shall proceed according to its competitive advantages and growth potentials. Finally it shall be ascertained that the role of PhD results, and consequently UBC, in development of industry sector are essential towards these direction.

It is apparent that the establishment of a local PhD Hub in Thessaloniki shall be built on the concept of mutual benefit of all stakeholders who will participate in

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this innovative and ambitious project. Briefly we could argue that the projected benefits for the main stakeholders shall be:

- Increased research opportunities for students;
- Increased available funding for both researchers and universities as a whole;
- Improved and Interoperable knowledge-transfer mechanisms both for universities and business partners;
- Identification of complementary and alternative funding sources for both universities and businesses

## 4. Thessaloniki Hub strategy

The development of a local PhD hub in Thessaloniki is of utmost importance for the following reasons:

- Development of a coherent policy that will enable the connection of business partners and universities' counterparts for exploiting their growth potentials under a well-established and common framework.
- Facilitation of extroversion, innovation and entrepreneurship among businesses and universities
- Adoption of a joint approach for triggering research and ensuring its transferability to the market stakeholders and society at large.
- Structured communication among universities, students and business partners that will allow to clearly identify the possible funding sources and needs.

Local government programmes can contribute to this direction (promotion of the PhD Hub) by:

- Addressing possible funding sources and needs or financing initiatives that, in turn, enhance innovation and entrepreneurship among business and academic partners as well as UBC clusters.
- Formulating and implementing a coherent policy concerning regional smart specialization

The most important elements of Thessaloniki's PhD strategy comprise:

- Establishing a quality policy framework for university-business cooperation, aiming to represent the interest of both academic and corporate fields
- Increasing research opportunities and their transferability
- Facilitating innovation and entrepreneurship within structures of both academia and business

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The overall vision of the Thessaloniki's PhD Hub comprises increased availability of funding and clearer perspectives for research results as well as development of a coherent policy framework under which academia and business will efficiently cooperate.

The aim of Local PhD Hub as a whole with the European PhD Hub apparently comprises applying and mainstreaming the European PhD Hub: The University-Business tandems will be responsible for implementing their local PhD Hub strategy and informing/training both academic and corporate staff members and potential PhD students on the opportunities offered by the European PhD Hub. The project will support stakeholders to register on the European PhD Hub, and open calls for cooperation.

The local/regional needs/challenges that dictate the development of Thessaloniki's local hub consist of the following:

- Identification of complementary and alternative funding sources
- Internationalisation of doctoral training
- Increase of research opportunities
- Strengthening of knowledge triangle
- Mobilization of PhD students

The activities which are projected to be organized by Thessaloniki PhD Hub:

- Development of a coherent policy in cooperation with local and central authorities in order to specify the strategic objectives, the available tools for setting and defining the framework for UBC and implementing successfully PhD strategy.
- Organization of a series of events (seminars/workshops/conferences) which aim to assist the various local counterparts to get acquainted with concepts of innovation, entrepreneurship as well as UBC, and more precisely, how these elements function in the real world through the provision of best practices and examples from EU countries.
- Establishment of network under which Thessaloniki's PhD Hub shall operate and dynamic assessment of its operability.

The most important benefits of the creation of the local PhD Hub and local PhD Hub strategy comprise the following:

- Support to HEIs in order to adapt to this changing environment and to their shifting role.
- How HEIs and business can cooperate to help drive social and cultural innovation.
- Improvement of knowledge transfer mechanisms
- Enhancement of Innovation and Entrepreneurship

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- Strengthening knowledge triangle and the interoperability of counterparts who contribute to this triangle.

The readiness of regional stakeholders in Thessaloniki Region to implement local PhD strategy is satisfactory in terms of ascertainment of the gap in UBC, although stakeholders are not adequately familiar with concepts of entrepreneurship, innovation; there is also lack of a consistent policy which defines the framework under which SBC shall be delivered.

SBC would be enhanced by PhD Hub idea through the addressing of funding sources, the strengthening of knowledge triangle and the internationalization of doctoral training which consequently facilitates mobilization of PhD Students and wider spectrum of available research opportunities. SBC, through the tool of PhD Hub, will accelerate its implementation on European scale and it is mutually beneficial for both academia and business.

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