

Institution: Staffordshire University

Unit of Assessment: 15 – General Engineering

a. Context

Engineering at Staffordshire has, always, had close interaction with industrial and non-academic partners. We recognise the UK Government's strategy, to support SMEs to become the engines of growth in the UK economy and to have global impact: we have strategically targeted this sector. For example, a recent project involves translating research conducted for the testing of medical devices to the testing of textile seams (<http://www.fashioncapital.co.uk/MOS/ATF-Textiles-Ltd.html>). This, relatively, small effort has had a massive impact on a micro-company in Stafford, its supply chain, and its global customers (2 full time staff currently manufacture and sell 30 million tape-meters of seam per annum and supply 8/10 of the leading clothing manufacturers).

We work closely with SME funding bodies (such as the Manufacturing Advice Service or Innovation Vouchers) to provide access to our research expertise. We enable industries to benefit from KTPs, SMART awards and other BIS/TSB led initiatives. We have dedicated staff who are employed to help industry to attract the funding to collaborate with us. Hence our "research led" income is far greater than our Research Council income.

Our collaborations also appear on a global stage: Case study 1 highlights how our research is creating impacts for patients across the World; Case Study Two illustrates how our work impacts on several European regions (e.g. <http://www.arbornwe.eu/>). Equally we are active within partner projects, funded by the EU, that support research training of visiting academic staff from other countries, many from developing economies (e.g. <http://ceres.egeu-fund.org/>)

Our research group is managed under an umbrella central body called the Centre for Energy Efficient Systems (www.staffs.ac.uk/research/cees/index.jsp); it is this route that the University provides funding for our research led activities. The centre's aim is to promote the philosophy that

"all systems must be designed in such a way that they always minimize wasted effort".

This approach allows us to bring many disciplines under one umbrella; this body contains three main themes. This grouping allows for the themes (or subgroups) to develop their own strengths and identities within a corporate umbrella, but more importantly it fosters collaboration and cross-fertilization. It is this body that acts as the focal point for interaction with our external partners; and it is this body that provides the momentum for the interaction to occur and hence to act as a focus to generate impact.

b. Approach to impact

The majority of our research effort is applied research. We are fortunate to have links with end-users that provide focus to this effort. Much of our research is either directly with an industry to build their IP portfolio; or we develop our own (Table 1 REF 5).

We have a formal project acceptance process that includes financial viability, but we also the project's ability for impact and exploitation. All new research projects follow a formal procedure to ensure financial viability, but we also assess the project's ability to provide some level of impact. To this end we have a project proposal process that looks at both project costs and then future potential; just being financially viable is not necessarily a criterion for a project going forward. Once agreed and accepted by the group, the project is then sent for approval, via central Faculty, to the University. In this way all key stakeholders whose support is necessary for the exploitation and

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dissemination phases are aware of the project from the outset.

One of our ultimate goals is financial exploitation of our research. This group benefits from strong links with the central University's Enterprise and Commercial Development unit. It is this unit's responsibility to ensure that any research conducted in the University ultimately reaches an exploitation route. We have several examples of this happening. On the other hand an exploitation route could be the delivery of research led short courses or consultancy. Our dedicated enterprise staff facilitate interaction with industry, government bodies and public bodies to enable our research to be exploited.

But not all exploitation is purely financial. We have been proactive in using our research to write new books (http://eprints.staffs.ac.uk/view/subjects/H100.type.html#group_book). In some cases these are text books for university students, in others they are industrial texts and in others they are research led texts. In this manner we have been able to influence how the next generation of products are designed. We believe, strongly, in making research accessible through the medium of the book (be that paper or electronic).

Children in Stoke on Trent and Staffordshire have one of the lowest expectancies to go on to HE in the country. We work closely with Staffordshire STEM, and other similar organisations, to provide talks, workshops and master-classes for school children. Two of our researchers have between them provided research led master-classes to more than 500 children over this REF period. The UniQ project (<http://www.uniq-stoke.org/>) was initiated to act as regeneration hub encompassing industry and education. Engineering has moved to the heart of the UniQ to support the regeneration of Stoke on Trent and we intend to expand our links into industry.

We use our networking skills to support HE-Industry interactions. As an example, one recent project involved working with the local RDA to bring the universities together in a way to demonstrate that the West Midlands is a centre for medical device development. We led a project, called Medical Interchange that was funded via HEFCE with support from the RDA, UBM Canon (a global organisation), and Messe Dusseldorf GmbH (the World's largest medical trade fair organisers). This project brought the 13 West Midland's universities together at 4 exhibitions. We succeeded in bringing universities in front of companies such as Alliance Boots and Lloyds Pharmacy; and for many of the partners this was something they could never have done alone. We took the 9 universities to exhibit as body in the World's largest medical trade fair (MEDICA http://www.medica.de/cipp/md_medica/custom/pub/content_lang,2/ticket_group/oid,29374), the first time a group of UK universities had ever done this.

c. Strategy and plans

As presented and discussed above we have the mechanisms in place that will enable us to continue providing research output that has measurable impact. We will continue to work with our dedicated staff associated with enterprise and commercial development to build networks with industry in order to foster KTP and other BIS/TSB/EU based projects. However, as stated in the research environment, we recognise that our research council funding is not as large as it could/should be. To this end we intend to use our ability to attract 'other' funding to promote greater interaction with the research councils. In this way we intend to grow our research base, whilst maintaining our applied research ethos. All projects will be required to meet PEST criteria to ensure potential for impact and exploitation. A critical examination of our existing impacts demonstrates that we have not been providing our unique facilities to other researchers in the way we should. One of our targets over the next period is to enhance our existing facilities to develop unique centres of expertise that are World Class and that would attract other researchers to use

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them; we believe we have the foundations for this to happen. This aspect of our strategy has started, our ECD unit has (and is) organised events with EPSRC etc. to foster closer working relationships.

We will continue to provide support for staff to perform duties outside of the University to support the activities of others. For example Ogrodnik is Founding chair for the IED Healthcare special interest group; and all staff regularly act as referees for journal papers, grant bids and as external examiners for PhDs. In this way we support, influence and have impact on the research community. Furthermore we will continue to organise research led conferences (such as UPEC). We will continue to support cross-university projects such as RESCO (<http://www.resco.org.uk/>) and RETS (<http://www.rets-project.eu>) whose aim is to disseminate research led knowledge to a wider community; as an example research staff from this UoA met (May 2013) with their equivalent partners at Keele to examine working together for mutual benefit.

We will continue to support the Staffordshire School's STEM initiative (<http://www.staffsstem.co.uk/>). Not only do we provide facilities but many of our research staff act as ambassadors to promote science and engineering in schools. In this way we are able to influence future generations. More importantly we support and influence many of the activities they use. It is noteworthy that Staffordshire STEM is recognized as one of the best in the country and they are influencing the activities of other such centres. Our move to Stoke campus and inherent proximity to colleges and sixth form colleges (<http://www.uniq-stoke.org>) will enable our interactions with school children and FE students to grow.

We welcome the Local Economic Partnership's plans to build an engineering led Centre of Excellence in Stoke on Trent and support its further engineering led aspirations (http://www.nscii.co.uk/news/news.php?news_id=580). We further intend to support other initiatives aimed at supporting R&D within SMEs (such as MAS, Innovation Vouchers, KTPs and SMART awards). We also intend to develop specific SME support schemes closely allied to our research strengths to support R&D in communities across the UK and the EU. Furthermore we will continue build on links and networks established through our visiting professors (e.g. <http://eprints.staffs.ac.uk/view/creators/DAVIS=3AColin=3A=3A.html>)

d. Relationship to case studies

The two case studies have been selected from a number of potential candidates as they demonstrate the reach of our research. The first case study demonstrates economic impact (spin out company, employment, sales and hence UK GDP) as well as social impact (patient benefits) and interaction with non-academic partners (hospitals and industry). The second demonstrates how our partnerships enable our research to reach a wide audience and influence a wide population; in this case through EU sponsored projects. We therefore submit, that the two case studies demonstrate we put into practice that which we describe above, and that our research delivers impact.