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Vitae Occasional Paper, Volume 3

A5: Who shares wins

A new model in doctoral training

Paper based on a workshop presented at the
Vitae Researcher Development International Conference,
8-9 September 2015, Manchester, UK

Presented and written by:

Dr Rebekah Smith McGloin

Dr Faye Taylor

Dr Keith Fildes

Edited by Dr Tony Bromley,
Senior Training and Development Officer
University of Leeds

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- **A5: Who Shares Wins: A New Model in Doctoral Training**
- **B10: Employing and supporting early career researchers – learning from Italy and Germany**
- **C5: The mentoring pipeline: institutional perspectives on mentoring as a development tool**
- **D2: BaFL: Business as a Foreign Language: How should we speak to PGRs from the Arts and Humanities in order to encourage engagement with enterprise and entrepreneurship education and training?**

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Contributors of this paper:

- **Dr Rebekah Smith McGloin**, Research Capability Development Manager, Coventry University
- **Dr Faye Taylor**, Policy and Projects Manager, University Alliance
- **Dr Keith Fildes**, Researcher Development Adviser, Sheffield Hallam University

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Foreword

Welcome to the third in the series of Vitae Occasional Papers, in this instance based upon work presented at the 2015 Vitae Researcher Development International Conference. The series has now provided a total of 16 papers on a wide range of subjects relating to the development of researchers. It is well worth taking a look at previous editions of the occasional papers if you haven't done so already. A full listing of the papers published so far is available in the annex of this edition.

As in previous years, presenters of workshops or special interest sessions at the conference had the opportunity to subsequently write a paper for the occasional papers series. The four papers included here again reflect the diversity, depth and vibrancy of the conference. This year, four papers were submitted. They are now published as separate papers, which together comprise Volume 3, which is available at www.vitae.ac.uk/occasional

In this paper entitled: 'Who Shares Wins: A New Model in Doctoral Training' Rebekah Smith McGloin provides a very valuable and interesting review of policy context in postgraduate research as a pretext to presenting an innovative new model for Doctoral Training. The Doctoral Training Alliance works across some 15 UK universities and offers a model in collaboration. The paper details how the model works including of course reference to the training and development of the researchers involved.

Our second paper 'Employing and supporting early career researchers – learning from Italy and Germany' by Laurence Hopkins, Hayfa Mohdzaini, and Geoffrey White, provides a fascinating account contrasting early career support and employment for researchers in different European contexts. As the authors state in their paper, 'The two country case studies highlighted in this paper offer different perspectives on the employment of early career researchers which merit consideration by UK HEIs.' The paper is well worth reading for anybody involved in supporting early career researchers in any nation.

For those already running mentoring programmes for researchers and particularly those wanting to set a programme up, the third paper in this occasional series should be essential reading. Susan Brooks, Sam Hopkins, and Kay Pearson, present an informative and practical guide relating to their experiences in setting up and running a range of different mentoring schemes in, 'The mentoring pipeline: institutional perspectives on mentoring as a development tool'. The authors cover a wide range of practical topics from launching schemes through to matching mentors and mentees and training and development support.

In the final paper we get baffled! Jane Nolan and Dawn Weatherston present, 'BaFL: Business as a Foreign Language: How should we speak to PGRs from the Arts and Humanities in order to encourage engagement with enterprise and entrepreneurship education and training?' This is a terrific study of the use and impact of language relating to business in the arts and humanities. The very practical listing of words that 'work' and those that don't in the appendix to the paper I think will be of great help going forward in understanding the different perspectives on language with a view to mutual engagement between business and the arts and humanities.

I do hope you enjoy the latest edition of the occasional papers and I also hope they will at least in part inspire you to make your own contribution to future editions.

Dr Tony Bromley

Senior Training and Development Officer, University of Leeds
Associate Editor, International Journal for Researcher Development

Introduction

This paper describes the development and initial implementation of a national cohort-based model for doctoral training in a group of universities in the UK that are affiliated with the University Alliance Mission Group. The Alliance mission group currently represents 19, geographically-dispersed higher education institutions – 17 English and two Welsh. Alliance describes itself as a grouping of ‘Britain’s universities for cities and regions’. Universities within the group typically deliver research and teaching with a specific focus on impact and application. They are depicted in Figure 1 below.

The model – termed Doctoral Training Alliance (DTA) – is the first initiative of its size, scale and mission. It has the potential to be further developed to work with a variety of researcher communities, nationally and internationally.

The paper explores the policy and funding context that led to the development of this initiative and examines how the model was built, using a case study of the first DTA in applied biosciences for health. It specifically considers issues of size, structure, identity, governance and evaluation.

The following colleagues contributed to the development of the DTA model and the first DTA in Applied Biosciences for Health:

- Prof Paul Harrison, Sheffield Hallam University
- Dr Faye Taylor, University Alliance
- Prof Yvonne Barnett, Nottingham Trent University
- Dr Jamie McFee, Manchester Metropolitan University
- Jennie Eldridge, University Alliance
- Members of the Management Committee, Training Group and Independent Advisory Group

The first DTA (in the Applied Biosciences for Health research area) was launched in October 2015 across 15 universities who belonged to the University Alliance mission group. The area of focus for the first initiative was decided on the basis of the most inclusive research strengths of the universities across the Alliance Mission Group as identified through their Research Excellence Framework (REF) submissions, in this case, Biosciences. A second (in Energy) will follow in 2016. Other areas are in discussion. It is likely that at full capacity the first two DTAs will offer high-quality cohort-based doctoral training to 150-200 postgraduate research students.

Fig 1. Representation of the geographical location of universities in the University Alliance mission group.



Many Alliance universities started as technical colleges and they still have very close relationships with business and industry partners. Their collective research strengths lie (as measured in the last Research Excellence Framework) in the fields of allied health, engineering, architecture and the built environment, design and business and management. Alliance universities employ 15% of the UK's university researchers but the majority will not have access to major investment from Research Councils for doctoral funding. A small number are partners in existing Arts and Humanities Research Council (AHRC) cohort-based doctoral programmes.

The policy and funding context

More for less

Both research and doctoral training have been characterised in the UK (and in North America and parts of Europe) over the last eight years or more by the familiar trend of more for less.¹ The research landscape has seen a period of stagnation or decrease in funding alongside growing demands and expectations in terms of quality, quantity, reach and impact of research outputs, dictated by the 2014 REF². At the same time researcher development has become increasingly prescribed, codified and measured through the three concordats³ and mechanisms to encourage compliance such as the HR Excellence in Research Award⁴ and Athena Swan⁵. The growing importance of university rankings and the variety of metrics they incorporate is the third set of measures which drives performance and encourages institutions to look at better ways of ensuring success.

'Can universities afford to stay single any longer?' (Fazackerley, 2012)

The Guardian headline asked a leading question back in 2012 that neatly summarises one of the major ways in which the sector has faced these challenges with new and innovative practice.

Open Collaboration or In-Crowd?

Collaboration has emerged as an over-arching theme which has been played out over recent years in a number of ways from the most informal, small-scale practice-sharing and co-authorship, partnership-working with industry to more formal consortia across universities and with business and industry, both in research and doctoral education. There has been instrumental policy change (Harrison, 2015b) to support, reward and recognise the value of collaborations in research and innovation, both between universities and business and industry and also amongst institutions in the higher education sector. In 2011, a significant policy shift saw the government move to acknowledge the value of collaborations in research and innovation funding mechanisms. HEFCE (2012) published guidelines for universities on collaborations and partnerships and by the following year the Leadership Foundation for Higher Education (LFHE, 2013) was sharing institutional learning in establishing large-scale partnerships, frequently based on individual relationships, and acknowledging the tension between collaboration and competition.

Despite the difficulties, the amount of research collaboration has grown significantly, and, as Harrison points out in his latest analysis, seems to have borne fruit in university rankings as well as income generation.

1 Smith McGloin and Wynn (2015) set out an overview of global trends in funding for doctoral training: Section 4 The International Perspective on Graduate Schools, pp. 15-17. See also Clarke and Lunt (2014). Denicolo, Fuller and Berry with Raven (2009) shows sector-wide anxiety in the UK regarding the end of 'Roberts funding' to support skills development in postgraduate and early-career researchers. In terms of the Spending Review offered qualified hope for science, as the flat cash settlement promised, this time took inflation into account broader question of research funding the science budget allocation to Research Councils UK is summarised here:

<http://www.rcuk.ac.uk/about/aboutrcs/governmentfunding/>. RCUK (2014) shows that total real income for the seven research councils (RCs) decreased by ~10% between 2009/10 and 2013/14. Although most recently the 2015 Autumn Spending Review offered qualified hope for science, as the flat cash settlement promised, this time took inflation into account.

2 www.ref.ac.uk/

3 The three concordats to support research are: Concordat to Support the Career Development of Researchers; Concordat to Support Research Integrity; and the Concordat for Engaging the Public with Research

4 The HR Excellence in Research Award is recognition of an institution's fulfilment of the European Human Resources Strategy for Researchers (HRS4R) – either by implementation of the European Charter and Code for Researchers - <http://ec.europa.eu/euraxess/index.cfm/rights/europeanCharter> - (for European institutions) or the UK Quality Code (QAA, 2004) and Concordat to Support the Career Development of Researchers (for UK institutions). See <https://www.vitae.ac.uk/policy/hr-excellence-in-research> for further details.

5 The Athena Swan Charter was established in 2005 to encourage and recognise commitment to advancing women's careers in science, technology, engineering, maths and medicine (STEMM) and employment in higher education and research. The charter was recently expanded to incorporate work in social sciences, arts and humanities, business and law and to support professional services staff as well as to address gender equality more broadly, not just issues affecting women. See www.ecu.ac.uk/equality-charters/athena-swallow for further details.

Relative to their position when the consortia were established, institutions in research consortia have been shown to perform significantly better than those outside them⁶. Many of the research consortia are also the basis for doctoral training partnerships and centres for doctoral training.

The University Alliance 2015 Report highlights the importance of future-proofing research and innovation in the UK through an open and sustainable approach. In particular, by developing a national research ecosystem that maximises complementary strengths, is responsive and relevant to society and industry, and nurtures future capability wherever high-quality research activity is found. However recent research has shown that the nature of emerging consortia within higher education is exclusive rather than inclusive – locking out modern, business-facing universities from ever-diminishing, increasingly competitive funding opportunities. In a recent paper Harrison et al. undertook a critical analysis of collaborative practices across universities with particular reference to RCUK-funded doctoral training programmes. The analysis showed an emerging pattern of large, para-regional research consortia working together to enjoy great success in securing block-grant funding for PhD studentships whilst universities without critical mass in research cannot readily gain access to the same funding⁷.

In the context of doctoral training it is acknowledged, that the cohort-based approach that is favoured by the Research Councils has the potential to lead to a two-tier system of doctoral education within research-intensive institutions (QAA, 2011). That is, PhD students outside of doctoral training programmes have access to less funding, fewer development opportunities and potentially a lower quality training offer than those within doctoral training programmes. The two-tier system is no less a threat across the entire research ecosystem where opportunities to be part of the latest developments in cohort-based programmes are largely restricted to PhD students in Russell Group institutions⁸.

The recent UK Research Councils review (Nurse, 2015) highlights this trend towards concentration of funding for research and research students and warns that ‘excessive concentration of the research effort (...) can significantly damage research activity.’(p.13) Nurse specifically references cohort-based doctoral training programmes as a barrier to PGRs being supervised by quality supervisors if the programmes were ‘too inflexibly applied’ (p.18).

A Cohort-based future for Doctoral Training

The cohort-based delivery model for publicly-funded PhDs is arguably emerging as a new paradigm for PGR training and support. Its effectiveness is being informally theorised in terms of peer-learning, communities of practice and learning communities amongst doctoral students. Although as noted in the UKCGE ‘Oxford Statement’ (UKCGE, 2015), evaluation is still required to measure its effectiveness for funders, universities and postgraduate research students⁹.

In practical terms, this new way of working presents on-going challenges to institutions. These have been set out in Smith McGloin and Wynn (2015) as: the impact of the changes on student experience, quality assurance, sustainability in terms of the financial burden of the cohort-based model and managing the intrinsic inequalities of a two-tier system of doctoral education. However, in a research policy climate which increasingly favours collaboration and where ‘critical mass is the key’¹⁰ there is arguably great potential for exploring how this model might (or indeed should) be developed and implemented in universities that are not major recipients of Research Council funding thus far.

6 Universities within research consortia on average gained 3.5 rankings on their position when the consortium was established, whereas non-consortia universities lost on average four places.

John Harrison, Darren P Smith and Chloe Kinton, The New Regionalisation of UK Higher Education, Loughborough University, February 2015 <http://www.lboro.ac.uk/enterprise/regionalisation>. See also the analysis in Gunn and Mintrom (2013) of the effect of membership of a global consortia on world rankings.

7 AHRC doctoral training partnerships and centres for doctoral training are notable exceptions to this.

8 The increased selectivity of research funding over the past ten to 15 years has resulted in a continued concentration of research students in a smaller number of institutions. In 2007/8, over one-third of the total student cohort was located in just nine institutions. Around 80 percent of the student base was located in 50 institutions (which is one-third of the total number of institutions with doctoral degree awarding powers). At the other extreme, 20 institutions had less than 25 postgraduate research students registered in 2007/8. All data is HESA (2009), cited in Denicolo, P., M. Fuller and D Berry with C Raven (2009) ‘A Review of Graduate Schools in the UK’. UKCGE.

9 To date, the Review of the ESRC Doctoral Training Centres Network, undertaken by a panel chaired by Richard Bartholemew in January 2015 is the most comprehensive review of cohort-based doctoral training. See in addition EPSRC (2015), although this report was more focused on economic benefit than structures for training doctoral students. The Higher Education Academy (2015) Postgraduate Research Experience Survey also offers some insight into the effectiveness of cohort-based programmes although institution-based reporting is in conflict with consortia-based delivery, where students move between institutions frequently and undertake substantive training at universities other than the one from which they will graduate.

10 Prof Colin Riordan (Vice Chancellor Cardiff University) writes here in reference to the GW4 Consortium - an alliance of four research-intensive universities in the South West of England and Wales: Bath, Bristol, Cardiff and Exeter. Cited in Harrison, 2015b., p.17.

This paper uses as a case study the development of the Doctoral Training Alliance (DTA) model. It will explore the key steps in developing the model, the governance structures and the evaluation strategy, with a view to exploring what this might mean for other communities of postgraduate researchers, policy-makers and research developers across the sector.

The Doctoral Training Alliance Model

Overview

The Doctoral Training Alliance (DTA) model is a nationwide collaboration that is designed to deliver the benefits of cohort-based doctoral training to PhD students within specific research areas at Alliance universities.

The model brings DTA students together at four touchstone residential training and networking events over the course of their PhD. A programme of electives, student project groups, the DTA webpages and social media are the means through which the cohort is built and developed between the touchstone events. The DTA model was developed to support University Alliance member universities in building a long-term future of competitiveness within the area of cohort-based PhD student training through collaborative-working across universities and partnership with industry. As such, industry involvement was central to the model, which aimed to build on Alliance university expertise in industry engagement to deliver doctoral training programmes that were responsive to actual and projected industry capability needs.

An additional objective was to seed cross-institutional research linkages and develop critical mass in areas of shared research strength in a geographically diffused network or what Harrison terms a 'constellatory' region (Harrison, 2015b).

The original model proposal required two funded students from each university for three years in order for that institution to join the programme. This was subsequently changed to between two and four students per institution to accommodate the levels of interest from participating universities. An additional financial commitment was required from each participating university to cover student travel and attendance at DTA training and events and also the cost of a DTA manager and administrator. Touchstone events such as summer schools rotate between partners and the burden of funding was carried by the host institution or institutions in turn.

All Alliance institutions were given the freedom to opt in or out of the initiative based on their own institutional strategic priorities. There was also the possibility of 'observer status' where institutions were interested in the development of the model but not the specific research area.

The same but different

The cohort size, duration of the commitment and operational costs are broadly similar to those required to leverage funding from Research Council block grants. However, there are a number of distinct differences. The first is in the amount of control held by Alliance universities in the DTA model, in terms of deciding the research focus of the programme. Institutional funding for PhD studentships is not necessarily tied to Research Council priorities as it is in more traditional doctoral training programmes. Instead it can be used strategically in a number of ways, to fund an area of historic research strength – as was the case in the inaugural DTA – to support emerging research priorities (national or international) or to target industry-identified skills deficits. In combination with the timeline from proposal to Cohort One (approximately six months for the first DTA) that Alliance universities are able to effect, this makes the DTA model potentially more responsive to changing research priorities and more in-tune with industry need than comparator programmes funded by the Research Councils. The theme of responsiveness and proximity to industry need is also found in the second distinct difference: DTA students are funded for three years only and the programme is designed on a three-year cycle rather than the common 3.5-4 years¹¹.

11 Doctoral Studentships range between three years and up to a maximum of 4.5 years (Medical Research Council with integrated masters) full time support depending on the student, programme and Research Council expectations. In the biosciences, the standard length of award for students on a research council-funded BBSRC doctoral training partnership is 4 years funding. Similarly doctoral students within centres for doctoral training funded by the Engineering and Physical Sciences Research council in the field of energy are four years (either as integrated masters and PhD or a standalone PhD.)

Graduates from the DTA will be able to take their skills and learning to industry or undertake postdoctoral research one year before their contemporaries. The challenges of this in terms of training programme design are discussed in the following section.

The final difference is in the potential for the cohorts to have a balance of students from UK and overseas as the funding model is unrestrictive in terms of the fee status of students who are nominated to participate in the DTA.

A question of identity

The differentiators are key in delivering the original objective, which was to develop a new way of delivering doctoral training that offered the benefits of the cohort model but capitalised on the strength and distinctiveness of research being carried out by Alliance universities.

Discussions of identity were central to the development of the model in three further ways. Firstly, in terms of the distinctive nature of the offer not only as Alliance universities but also in responding to the limited evaluation data available for existing Research Council funded networks of doctoral training programmes. At the time of development this was principally the Review of the ESRC Doctoral Training Centres Network, undertaken by a panel chaired by Richard Bartholemew (Bartholemew, 2015). This review highlighted a number of significant issues that were considered as still to be addressed. The most relevant of these included: the challenges of balancing supply and demand in training offered through a national network and the need to develop more virtual learning approaches; the challenge of growing and maintaining collaborations with non-academic partners; and the requirement for an explicit set of agreed outputs and outcome criteria in advance so that all parties are clear on how success is being assessed.

Was there an opportunity to develop a model that addressed some of the known challenges, both of cohort-based doctoral programmes and of national training structures and to create an identity as a new-wave initiative that built on a past evidence base of evaluation?

Secondly discussions addressed how the DTA would be positioned and in what ways it would interface with participating universities. Would it be the first doctoral training programme to construct an identity with a university mission group rather than an individual or a group of universities? Or could the DTA be led by a partner institution? Would the DTA be identified as a generic training provider or would it focus on delivering advanced research skills training and supporting a strong research community – most relevant to the research focus of the initiative? Would DTA training be accredited and what role might the DTA have in monitoring progression?

Activity	Who has responsibility for provision?	
	University	DTA
Recruitment	✓	
Induction	✓	
Progression	✓	
University-specified mandatory training (m-level modules, workshops etc.)	✓	
Specific research training - niche skills, specialist equipment	✓	✓
Larger scale tailored training with input from relevant industry partners (e.g. commercialisation, entrepreneurship)		✓
Nationwide networking opportunities and cohort development relevant to the programme research area		✓

Figure 2. Overview of how responsibility is shared between universities and the DTA.

The third strand of discussion on identity considered how an individual DTA student might feel and how to best achieve the balance between students identifying with their home institution and equally feeling part of and benefiting from a nationwide community of postgraduate research students all working in similar research areas. Much consideration was given to the impact on the DTA students of inhabiting multiple identities and how the initiative might be constructed to build on the advantages and minimise the disadvantages of this.

Added Value

These early discussions on difference and identity informed the development of the model as a supra-structure, creating what has recently been termed a ‘meta-cohort’¹² that allowed participating institutions to leverage the benefits of critical mass across a distributed training alliance. Figure 2 shows how the model allows individual institutions to retain autonomy whilst benefiting from added-value activity such as DTA branding for recruitment, a wider variety of niche skills training and an enriched research environment within a wider community of students and supervisors working in the same or cognate areas.

Governance and Evaluation

The governance structure was a key factor in achieving the balance between institutional autonomy and Alliance added value, in effective and early evaluation of a new model and in developing and capitalising on the distinct characteristics of industry-facing research.

To this end the main objectives for the governance structure were to provide fair representation and accountability in decision-making and to embed a role for the main stakeholder groups. The structure was also developed to be a robust framework that could support a growing number of DTAs in a range of research areas. DTA national would function as a mechanism for strategic leadership and practice-sharing across a portfolio of DTAs in the future.

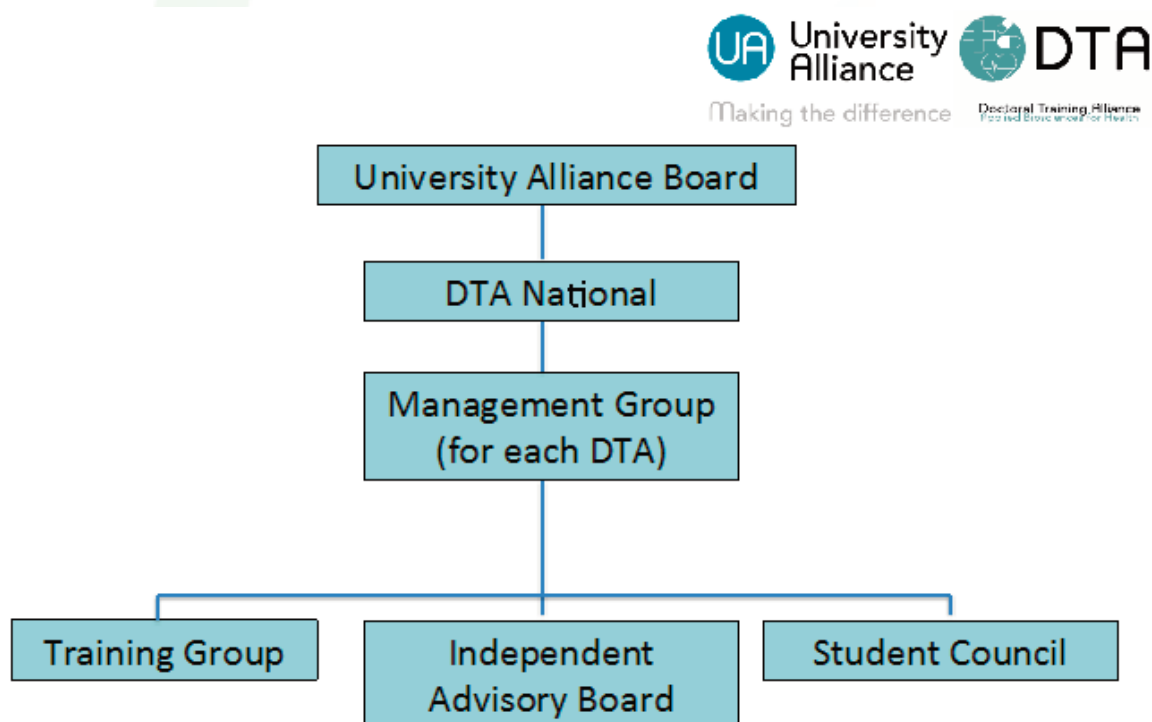


Figure 3. DTA governance structure.

¹² <http://blog.hefce.ac.uk/2016/03/15/professional-doctorates-the-shape-of-things-to-come/>

The Management Group (for each DTA) is constituted by equal representation from senior academic staff from each participating university and chaired by the DTA Director. This is common to the majority of cohort-based doctoral training programmes. However, in this instance – without a lead institution (as would be the case in an externally-funded initiative) –the Director and Training Group Chair roles are filled through an open call for expressions of interest that are considered by representatives from the DTA National committee. This is an important part of the democratic approach to developing the Doctoral Training Alliance. Another difference with standard practice is the designation of ‘observer status’ which enabled institutions to be part of the Management Group even if they were unable to commit students to the programme (for reasons of institutional strategy). This facilitated the widest possible engagement in the development process.

Industry representatives (as future employers, research end-users and potential research collaborators) were invited to join the Independent Advisory Group (IAG). The board is designed to provide advice and guidance to the Management Group with specific reference to relevant national benchmarks and industry need in the present and in terms of future trends.

Students (as partners in developing and evaluating the programme) who were invited to form a Student Council, which contributed to the Management Group, met with the IAG as part of the annual review process and participated in the training group. In the initial year of the first DTA in Applied Biosciences for Health the student voice has been a critical factor in shaping the programme. In particular, the programme content for the summer school has been reduced and more unstructured time for cohort-building and networking has been built in as a result of student feedback from the Autumn School. The programme of elective training was also shaped by student development needs analysis that was undertaken as a workshop in the autumn school.

The Training Group is the other body that comprises the governance structure. A balance of expertise and leadership both in research and doctoral training is important to assure quality and relevance in the programme. To achieve this the membership of the Training Group is equally divided between subject-specialists (active researchers in the area of the DTA) and researcher developers (specialists in doctoral training).

An evaluation framework was created as part of the governance structure. This framework was developed to provide early, regular and detailed evaluation of the programme (i.e. within the first few years, before the first intake has had an opportunity to publish or to complete) and to frame and focus the role of the Independent Advisory Group (comprised of industry partners, doctoral training policy specialists and senior leaders from within the higher education sector with experience and expertise in translational research).

The framework sets out expectations of the kinds of evidence that will be presented to the Independent Advisory Group as part of an annual review process (that takes place at DTA summer school.) After the first three years the evaluation will sit alongside more standard measures of success such as submission and completion rates.

One of the key objectives of the framework was to provide an early and ongoing measure of the extent to which the DTA could ‘build on Alliance university expertise in industry engagement to deliver doctoral training programmes that were responsive to actual and projected industry capability needs’. The role of the independent advisory group in interpreting the evidence presented against the framework and supporting the on-going development of the programme to meet this objective is crucial. Evidence that relates to this objective is emboldened in Figure 4: DTA Evaluation Framework on page 11.

The review is carried out by the Independent Advisory Group and comprises three evaluation areas that reflect the major foci of the Training Alliance: postgraduate research training; community and communication and translation of applied research. The framework sets out an overview of how the DTA will collect evidence to measure success in these areas. The Independent Advisory Group are then requested to make recommendations on the basis of their review findings to the Management Group regarding areas for improvement and new areas of focus.

Evaluation Area	Evidence
1. Postgraduate research training	<ul style="list-style-type: none"> ■ DTA Student Survey Data ■ Development Needs Analysis Data ■ DTA Postgraduate Handbook ■ Training programme documentation ■ Summary of training programme attendance ■ Student and supervisor interviews ■ Destination data (from 2018) ■ Employer/placement host (where applicable) interview data
2. Community	<ul style="list-style-type: none"> ■ DTA Student Survey data ■ Student, supervisor, external partner interviews ■ Interaction/mobility data (mapping Communities of Professional Practice for students and supervisors)
3. Communication and translation of applied research	<ul style="list-style-type: none"> ■ Training programme documentation ■ Student, supervisor and industry interviews ■ Interaction/mobility data (mapping Communities of Professional Practice for students and supervisors) ■ Training and event reports and evaluation data ■ Summary overview of student impact data (publications, participation in industry, community, policy and public engagement activity)

Fig 4 (DTA Evaluation Framework)

Programme Development

There are a number of key opportunities and challenges – common to all DTAs – which influenced the development of the training framework (Figure 5).

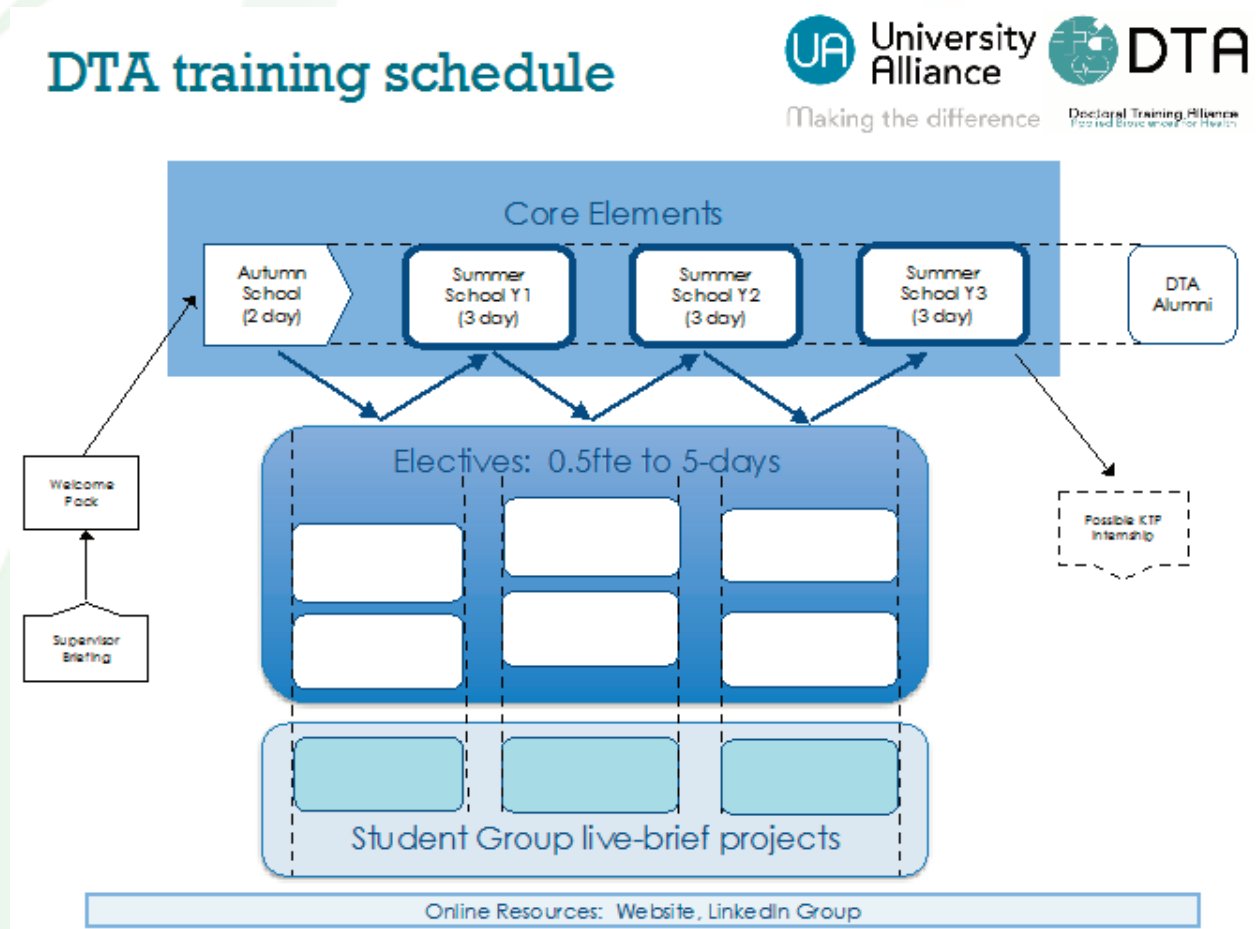


Figure 5. DTA training framework

The main opportunities are: developing critical mass of PhD students within a focused research area, improved access to training (particularly with regard to niche skills or where specialist equipment is required), and tailored development for employability in career destinations common to postgraduate researchers within the research area defined by the programme. The major challenges are the size of the Training Alliance (up to 19 partner institutions currently), the geography (376 miles north to south and 200 miles East to West), the programme length (three years rather than four) and student engagement with the programme. The framework was developed to capitalise on these opportunities and to respond to the challenges.

It aims to offer an appropriate amount of training and development opportunities without compromising the ability of the students to submit their doctoral thesis within the three-year programme length. It also looks to achieve a balance of core and elective training. Students can benefit from the peer support associated with residential touchstone events and student group projects at the same time as benefiting from an additional programme of electives, tailored to their individual training needs. There is also a balance between modes of delivery: face-to-face (autumn and summer residential schools), online resources (website) and remote facilitation (student group live-brief projects).

The intention of this is to support student engagement. Pre-registration and post-graduation activity is designed to enhance cohort development and to also to engage alumni in the future in enriching development opportunities (training, short placements) for employability.

The first steps towards populating the framework were undertaken by the training and management groups from the first DTA in Applied Biosciences for Health, during two facilitated days. The approach taken was to build consensus in initial discussions on what the qualities of the DTA student would be by the end of the programme. This narrative was subsequently developed to map these qualities to external skills frameworks such as the Vitae Researcher Development Framework and the (now historical) BBSRC Skills Framework) and align with the values of the Alliance universities. This then provided the basis for a single over-arching programme aim, underpinned by a set of core training themes (set out below).

DTA training themes



Producing independent, well-connected, highly employable, experienced doctoral graduates with knowledge, expertise and skills in strategically-important research areas, through development focusing on:

Values	Critical reasoning, epistemology, research integrity
Community and Networking	Nation-wide and international cohort, broad professional connections
Specialist Skills	Advanced technical and subject specific
Applied Research and Enterprise	Professional innovation, practical application, industrially-relevant, KTPs
Communication and Translation	Academia, industry, SMEs, public

Figure 6. DTA training themes.

The training themes (Figure 6) informed the content of the autumn and summer schools, the programme of electives and the student live-brief projects in the first DTA and the structure for the evaluation framework that includes the annual review. They will also shape future developments of DTAs in other research areas.

Who shares wins?

There has not yet been sufficient time to evaluate the effectiveness of the model in terms of quantifiable measures such as submission and completion rates, research outputs and student employability. The DTA in Applied Biosciences for Health has recruited a first cohort of 30 postgraduate students who have almost completed their first year. The DTA in Energy is currently recruiting.

In early evaluation, conducted via an online survey following the autumn school in the Applied Biosciences for Health DTA¹³, students and supervisors both reported an appreciation of the added value that the programme provided in terms of additional training opportunities and networking. Certain respondents highlighted the breadth of the research that falls within this DTA as a challenge to effective networking and the perceived relevance of some training sessions. This feedback has informed the on-going development of the training offer and review of how the model is developing.

Further development and focus is required to capitalise on the potential for the DTA model to support cross-institutional research collaborations and asset-sharing. There is also the opportunity for the programme to deliver supervisor training at a national level. Further elements of international mobility and the creation of new and innovative ways to work in partnership with industry and the third sector are also areas where there is scope to enhance the existing offer.

Whilst there is current intention and clear potential to generate a portfolio of similar initiatives across a broad range of research strengths within Alliance universities there will be future challenges as the model is scaled up. These include: the increasing cost of residential training for a growing body of postgraduate researchers, the possibility of an ever-more apparent two-tier system, at an institutional level, of students within a DTA and those outside of it; and a degree of loss of institutional autonomy in terms of the flexibility to change university priorities for studentship funding between research areas to fit institutional strategy (as the DTA model requires a commitment to at least three cohorts, which represents a five-year investment).

The Doctoral Training Alliance initiative captures the Zeitgeist of recent changes in doctoral education in many ways. It resonates with sector trends identified in Smith McGloin and Wynn (2015) for growth, diversification, partnership-working and multi-layering of programmes and identities. It also complements the current re-configuration of the research landscape into a variety of partnerships, special relationships and consortia. As this new paradigm emerges it raises some fundamental questions about the health of the research ecosystem, and at the heart of it, about how the next generation of researchers are trained. It also poses a conceptual conundrum for research and researcher funders, managers, developers and leaders alike.

With the exception of the arts and humanities research area, there are no cohort-based doctoral training programmes that cross the divide between research-focused and business-facing institutions. This would seem to be counter to two sector imperatives: better business engagement with research (Dowling [2015], Wilson [2012] also called for postgraduate research students to further develop enterprise skills and business experience in order 'to maintain contact with the application of research.' (p.2); and a shared desire amongst many business-facing institutions to grow the quality and quantity of their research¹⁴.

As the majority of the sector spawns new generations of increasingly homogeneous consortia, which as the DTA model demonstrates, can even be mission group-led, is there a risk in not actively pursuing further the most obvious of wins – that is consortia which bridge the gap between types of institutions and deliver postgraduate researchers training, opportunity and insight from across the sector?

13. Of the 27 students who attended the autumn school, 16 responded (giving a 59% response rate) to the online evaluation survey that was circulated to them following the event. The survey was only sent to those students who attended the event as the format was such that it would not have been relevant to those who did not attend.

14. Research growth, measured in a variety of ways, is a common theme in all public-facing corporate plan documents, published by Alliance universities.

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We work in partnership with UK and international higher education institutions, research organisations, funders, and national bodies to meet society's need for high-level skills and innovation.

Vitae aims:

- Influence effective policy development and implementation relating to researcher development to build human capital
- Enhance higher education provision to train and develop researchers
- Empower researchers to make an impact in their careers
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