## Principal Applicant Details

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<td>Current Post/Position</td>
<td>Director, Institute of Educational Technology</td>
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## Summary of Doctoral Scholarships Programme

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<tr>
<td>Title</td>
<td>Open World Learning (OWL)</td>
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Rationale for the selection of this area/discipline

We seek support for a programme of PhD studies to address inclusive approaches to learning across disciplines, integrated by a focus on Open World Learning, for which The Open University has a worldwide reputation. Our proposal aims to increase understandings of the complexities of Open World Learning compared to systems and approaches that close rather than open opportunities because of social, geographical or technical barriers. To do this requires a strong cross-disciplinary approach centred on educational thinking but involving a range of subjects across the University. This cross-disciplinarity means that obtaining funding from domain-specific research councils is not straightforward and there is no targeted programme in this area. The Leverhulme Foundation’s Doctoral Scholarship funding, on the other hand, is specifically focussed on cross-disciplinary and complex research topics.

Recruiting 18 students over a three year period to a coherent programme in Open World Learning will be transformational for participants and have a major impact on the understanding of innovation and education. This cohort would be brought together under the umbrella of the University’s Centre for Research in Education and Educational Technology (CREET). They would also benefit from our sector-leading Virtual Research Environment (VRE), providing resources and a shared identity. In the extended case we present a framework setting out the scale of work, contexts for study, and the ‘enablers’ and ‘disablers’ that will be investigated. This will help to establish both individual and collective impact for work by those receiving the Leverhulme OWL Doctoral Scholarships.

The relationship between the proposed scholarships and any current doctoral training awards in this area, and details of how the Leverhulme Scholarships would provide added value

The Open University is a partner in four Doctoral Training Centres: Design Star and CHASE (Consortium for the Humanities and the Arts South-East England), both approved by the AHRC; CENTA (Central England NERC Training Alliance); and the EPSRC-funded Centre for Doctoral Training in Nuclear Energy. These are based on world class expertise in the humanities, design, environmental science and nuclear physics, involving 18 other research partners. They reflect the strength of our collaborations with other universities, research organisations and industry, and an ability to take a lead in setting research agendas. A successful CREET programme of Leverhulme Doctoral Scholarships, focusing on Open World Learning, would present multiple opportunities for interfacing with and enriching these existing and future training partnerships.

The OU has in place excellent systematic and discipline-specific research training in face to face, online and blended form. As well as state-of-the-art campus facilities, this includes our ground-breaking Virtual Research Environment, which gives research students and supervisors access to a range of services such as researcher development resources, careers advice, community networks and guidance. The Open University Graduate School further ensures the highest quality of training, supervision, facilities and welfare, including research student training in our 26 Affiliated Research Centres across the world.

The increasing numbers of students within the DTCs, the work of the Graduate School and the specialised research environment of CREET provide the conditions for the Leverhulme Doctoral Scholars to benefit from a critical mass in research while retaining individual focus on their study.
Description of how the university would sustain the legacy of the Scholarships in the chosen area

The Open University will sustain the legacy of the Leverhulme Doctoral Scheme in four different ways.

First, the concerted efforts of a programme of research conducted by 18 students will make an important contribution to understanding ‘openness’ in terms of learning and knowledge, addressing the challenges and identifying what works. This will be integrated into research into the role technology plays, and the opportunities and challenges presented by a constantly changing technology landscape and emerging digital divides to provide continuing themes.

Secondly, the staff and student experience gained through cross-faculty working to support the students undertake interdisciplinary research will be developed into a model for constructing and working in interdisciplinary teams focused on solving problems. This is an important development in working practices to improve our capability for tackling some of the challenges of the 21st century.

Thirdly, the additional resources placed alongside the Leverhulme grant by the OU will fund studentships for lower and middle income countries as part of our commitment to access. This will broaden the experience of the cohort each year and at the same time assisting continuance.

Finally, there will be a direct legacy of the scheme in the contribution of trained researchers adding to UK capability in researching the tricky and complex interdisciplinary topic of openness. We will support these researchers in developing their research careers and identify sustained links from the cohort to the OU.

Supporting Statement

The Open University strongly supports the proposal for a Leverhulme Doctoral Scholarship programme in Open World Learning. This theme relates to the greater connectivity and availability of information that impacts on lives in all regions and sections of the world, and offers the chance to transform learning. Realising this potential requires research that spans different contexts and engages different perspectives in a way that is ideal for interlinked doctoral studies led by experienced supervision teams. The innovative and cross-disciplinary OWL programme will be located in our world-leading Centre for Research in Education and Educational Technology while integrating contributions from Faculties across the University. Since its formation nearly 50 years ago The Open University has established a record of state-of-the-art research and world-class expertise in intelligent use of technology to deliver online and distance learning. In RAE2008, 77 academic members of CREET were included (3rd highest in the Educational panel), CREET’s significance was recognised in the 2012 award of our Regius Chair in Open Education (Professor Eileen Scanlon), and
the more recent ICDE Chair in Open Educational Resources (Professor Martin Weller). Funding for the Leverhulme Doctoral Scholarships would capitalise on our institution-level commitment to openness and learning, while enabling a step change in areas of high strategic significance for the UK and its future competitiveness in a fast globalising world of higher education. The OWL programme will focus on four themes (People, Places, Practices and Properties), and use various conceptual frameworks to consider these at different levels of granularity (macro, meso and micro). Thus the different studies will contribute to advancing knowledge and addressing key challenges in education today. The Open University has a considerable track record in the area of technology-enhanced learning and openness. The proposal represents supervision experience of 150+ students and grant income of approximately £10M+ from sources such as RCUK, EU, Government, international funders and charities. However, it is also an area where direct research support is scarce and where the scholarship funding can make a significant difference. There are no Research Council programmes that specifically focus on the cross-disciplinary themes of OWL and yet the issues raised cover social, technical and practical challenges that are important to the education sector and wider society. The Open University is the ideal environment for such a Doctoral programme. As well as providing an excellent existing infrastructure, we would complement the Leverhulme support with additional commitments: providing additional studentships, focussed management, physical laboratory space, and an effective virtual research environment. This investment would ensure the legacy of the Leverhulme investment as a strengthened programme of interdisciplinary work able to build on the evidence base established by the studies, including provision for such a programme within the OU research strategy (2015-2020) which has education and pedagogical research as one of its central themes. I am delighted to give my full support to this proposal, which reflects our current and future strategic directions and the University’s commitment to undertake excellent research on issues of concern to society.

Name | Tim Blackman  
Position | PVC Research Scholarship & Quality  
Email | Tim.Blackman@open.ac.uk

I confirm on behalf of the Principal Applicant’s institution that:

a) We have fully read and approve of the content of this application, which is to request five doctoral scholarships in each of three years at a total cost of £1,050,000.
b) We understand that agreement to the Trust’s terms and conditions will be requested following the offer of a grant.

Name | Xiao Tan  
Position | Research Grants & Systems Officer  
Email | xiao.tan@open.ac.uk

File: FINAL_Open world learning (5).pdf  
Attachment is included at the end of the document.
Open World Learning: OWL

0 Introduction
Learning in the 21st century is undergoing both subtle and radical transformation as a result of the impact of digital, networked technologies. Open learning gives unprecedented access to information and education and provides support to learners across the globe. However, it is not the technologies themselves that represent the biggest change, but the opportunities for openness that flow from their thoughtful application, in the form of availability of and access to formal and informal learning. Without research to gain deeper understanding the changes in learning may exclude the very people who most stand to benefit from them. For example, those likely to complete free, online courses tend to be qualified to degree level already. Ironically, the revolution in open learning is in danger of increasing the digital divide by privileging those with the appropriate digital and learning skills to best take advantage. It is this issue that the Open World Learning programme will address.

We propose to establish a doctoral research programme that will generate knowledge, develop theories and produce evidence in Open World Learning (OWL) through integrated but independent studies by 18 PhD students (15 from Leverhulme, and 3 additional OU-funded) that can address the critical issues around the topic of open learning. The Open University (OU) is internationally recognised as having significant experience of identifying tensions within existing systems that make it hard to offer open education. With 45 years of experience in open learning, we understand the evolving landscape that creates opportunities and challenges for the 21st century.

The complex\(^1\), contradictory\(^2, 3\) and multi-disciplinary\(^4, 5\) nature of Open World Learning is fundamentally changing society and the foundations of education. This drives an urgent need to review the “enablers” and “disablers” of Open World Learning for inclusive approaches to learning across educational sectors, disciplines and countries\(^6\). This ground-breaking and world leading doctoral training programme is structured to generate evidence, encourage theory construction, and lead to well-described new knowledge that informs practice across disciplines. To do this requires a strong cross-disciplinary approach centred on educational thinking by involving a range of subjects across the University. Four Open World Learning themes have been identified: People, Places, Practices and Properties. These will be investigated to see how systems enable or disable Open World Learning and what the factors are that maintain (or shift) the current balance. These themes will be the focus of 18 doctoral projects which will rigorously explore a range of research questions outlined below at a macro (national, UK, global), meso (regional, cross-institutional) and micro (local, within organisation, individual) levels of granularity.

The OU’s international expertise in open learning was recognised last year by a Royal appointed Regius Chair in Open Education and UNESCO awarding an International Council for Open and Distance Education Chair. Both are part of the Centre for Research in Education and Educational Technology (CREET) within the OU, and CREET is uniquely placed to bring together a range of disciplines and faculties around the open learning themes (see Table 1 below). Strong institutional support is also provided for this proposal, including provision for such a programme within the new OU research strategy (2015-2020) which has both education and pedagogical research as one of its central themes.

1 Open World Learning
The world is becoming a more connected place with the emergence of immediate access systems (e.g., smart phones, tablets), social media, and new methods of working. This is accompanied by the advent of English as a lingua franca that is helping people to share information and communicate across the globe\(^4, 7\). Open learning seeks to understand access to education, structures, and the presence of dialogue and support systems\(^8, 9\). The challenge of Open World Learning is to foster inclusion and widen access to information, knowledge

Open World Learning (OWL) 1
and learning, rather than to allow people, organisations and governments to increase divisions and build closed groups with privileged access to information and education. One key aspect of OWL is openness; how approaches to learning can be designed to enable sharing and co-creation of knowledge. However, these innovations are also changing how societies understand ownership of knowledge, information, expertise and the process of learning. At the moment, practice is leading theory\textsuperscript{2},\textsuperscript{10}, and research is needed to close this gap and allow experiences from particular contexts to inform generalised approaches with strong conceptual underpinnings.

The OWL programme presents systematic, rigorous and coherent cross-disciplinary research challenges for PhD studentships. We will explore understandings of “openness” by considering open technology\textsuperscript{11},\textsuperscript{12}, and socio-technical informed changes to educational practice\textsuperscript{1,3,13}, policy and research into the future. To achieve this four Open World Learning themes have been identified and will be explained below: People, Places, Practices and Properties. These will be investigated to see how technology-enhanced systems enable or disable open learning and what the factors are that maintain (or shift) the equilibrium.

1.1 Themes: People, practices, places and properties
The concept of openness in terms of learning and knowledge is usually associated with transparency, democratisation and inclusion\textsuperscript{14}. As stated in The Cape Town Open Education Declaration (2007), “open education is not limited to just open educational resources. It also draws upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues. It may also grow to include new approaches to assessment, accreditation and collaborative learning”. Yet openness also raises challenging questions about the freedom of sharing information and the value of privacy, about who owns knowledge and how to best use it, and about how to widen access to learning beyond our “Western” contexts.

For the People theme we refer to inter-relations between sharing, inclusion and expertise in terms of education and training. Open world technologies enable freely available content and crowd-sourced sharing (Twitter, Facebook, and Massive Open Online Courses). These emerging open world technologies can enable transformative – and often informal – learning for all (i.e., children, students, professionals, mature learners) as well as socio-economically disadvantaged, isolated, marginalised or hard-to-reach groups (e.g. prisoners, immigrants). At the same time, research indicates that not all of these groups are able to benefit fully from open education\textsuperscript{15-19}. Questions of pedagogy (e.g. how to teach 1000s of students simultaneously online? how to provide personalised feedback?), the changing role of expertise (e.g. who owns, creates, and “validates” new knowledge?), patterns of user participation (e.g. can and will each learner contribute? how to create and maintain an online identity? what incentives do people have to share via open educational resources?), retention rates (e.g. is a dropout of 95% in MOOCs acceptable?), and the policy and governance aspects of open provision are all under-researched. We will bring best-practice and evidence-based research\textsuperscript{30} together to contribute to helping people to reach their potential using Open World Learning through 18 PhD projects.

Places centres around issues of where and how people learn from each other, across regions, borders and other boundaries. On the one hand, people have become less dependent on their specific geographical location in order to access open world systems. On the other hand, some open world events are only locally relevant, or are restricted by governments or organisations (e.g. in China or Turkey, or some schools restricting Facebook), even if they can be accessed on a global level by others. Location is also relevant as smart cities make use of open data (e.g. Milton Keynes is supported as a “Smart City” by a consortium of companies and The Open University through the MK:Smart initiative). People also engage in an open world at a more local level (examples include projects such as Nquire\textsuperscript{31} and Juxtalearn\textsuperscript{32} that use mobile technologies to support local investigations). In addition, social meeting places are moving

Open World Learning (OWL) 2
increasingly online, and individuals are enveloped 24/7 by open, pervasive technology. This results in challenges for those left behind with either little or no access to learning in large parts of the world due to social, institutional, infrastructural, cultural or linguistic factors. For example, building on the networks created through successful international development projects at The Open University (including mass teacher, health care worker and English language programmes), at least one PhD project will examine the use of open educational resources and mobile technologies for teacher training in sub-Saharan and South East Asian countries, and their sustainability beyond their funding cycle. Using principles developed with the OER Research Hub and award-winning projects such as Teacher Education in Sub-Saharan Africa (TESSA) and English in Action (EiA), a research agenda that is built on the notions of people, social justice and education for all will help to investigate the enablers and disablers to open learning.

**Practices** refers to differing epistemological/conceptual notions of openness, such as citizen science and public engaged learning, with ordinary people engaging in knowledge creation. Within different practice domains open educational resources, such as the OU’s OpenScience Laboratory, are transforming education, for example through the management of learning resources in natural disaster situations. Yet the question is whether we are really changing these disciplines and engaging various sections of society in different roles for knowledge production, or whether we are just exploiting their brainpower to train technical experts and keep knowledge and skills enclosed. Practices in terms of open learning are also changing in schools, with more learner-centred approaches to teaching and assessment. OWL will provide a holistic research agenda examining how different practices of openness are influencing society and education in particular, using concepts of the evidence hub and impact map.

**Properties** of open world data have a tremendous influence on people, places and practices. For example, how to link open data and big data to information and knowledge within learning is a vast, complex challenge. At the same time, there is increasing concern about how commercial, governmental and public organisations are constructing (unique, multiple) identities of children and adults based upon the online traces they leave behind with their technological devices on websites, social media or phones (e.g. WiFi traces used to monitor shopping behaviour, using geo-location positioning with Google maps as SATNAV). Similarly, notions of open licensing, open access publication, and sharing data will be examined. OWL will provide a state-of-the-art framework for 18 PhD students of how the properties of open world data, including privacy and ethics, impact upon people, places and practices.

### 1.2 Technologies: enablers, disablers and equilibrium

As observed in a recent Ofcom report, “Britons spend more time with technology devices than they do sleeping.” Open World Learning will be viewed through the lens of technology, which has become all-pervasive. The new digital media have the potential to open up education across space and time by linking people together and providing access to open content. In the latter context the open world is characterised by a lack of restriction on access. In practice, this has meant the adoption of clear licencing, such as Creative Commons, taking an approach to sharing that assumes that many people will be able to use results, materials and technologies that have been developed by others. The expectation is that technology changes the model of adoption, but it also means a different view of ownership, privacy and motivation. Openness can also act in a viral way to impact on attitudes and raise ethical and philosophical concerns.

Open world technology can play a major enabling role in providing 24/7 global information, knowledge and learning access. For example, the most downloaded language app Duolingo allows 25 million+ learners to develop their second language outside the restrictive walls of the traditional classroom. At the same time, millions of learners follow MOOCs across the globe. Learning analytics may provide tools to help improve education in an evidence-
based manner and to provide personalised and bespoke learning experiences\textsuperscript{44-46}. Furthermore, the growth of social networking is providing important educational opportunities, particularly in the context of language learning\textsuperscript{47-50}, where language is both the medium (i.e. the channel that is being used for learning) and the message (i.e. the content of what is learned).

Nonetheless, openness has its disablers (e.g. restrictive quality assurance regimes, required integration across units, accreditation and cost), and the excluding power of “closed” systems (such as classrooms, universities or corporate training programmes) may seem more persuasive in some situations\textsuperscript{51-53}. Many open technologies are subject to – and still have in many cases – (over)inflated expectations as change agents (e.g., virtual world learning, artificial intelligence enabled learning) whilst only providing different practices within the same educational parameters (e.g. in the context of a transmission-based approach to learning)\textsuperscript{11, 54, 55}. Some of these “technical disruptions” actually contribute to maintaining restrictive educational norms and practices\textsuperscript{3, 56-60}. This is the case with many MOOCs, which, despite their aspirations to fundamentally open up education, are used mainly by well-educated learners in Western countries\textsuperscript{61, 62}. Virtual Learning Environments have also been identified in some cases as hindering teaching and learning innovation in higher education\textsuperscript{63}. There are also disablers in terms of learners being concerned about using private spaces for educational purposes\textsuperscript{23}, or in connection with the public nature of such sites, which may result in negative learner experiences. There are ethical and privacy implications, for example in learning analytics through increasing levels of monitoring, surveillance, and profiling\textsuperscript{36, 51, 64}, or public concerns whether open education will shift the balance of power of governments, schools and educational institutions to a global, “uncontrolled” space\textsuperscript{55}. Finally, several groups of users (e.g. teachers, older people, people with particular disabilities) seem to struggle to embrace and integrate open technology, leading to resistance and anxieties towards new technologies\textsuperscript{38, 54, 65-69}.

The OWL programme will provide pathways to explore enablers as well as interrogate disablers to knowledge generation and learning through open technology. The tensions between enabling and disabling factors of Open World Learning may shift education into new, uncharted spaces, leading to a new (temporary) equilibrium in society and education. For example, at this moment in time it is unclear what the balance is between unrealistic expectations and uncontrolled openness on the one hand and closed models of society with “panopticon-style” surveillance systems on the other, where people can be watched over at all times\textsuperscript{70, 71}. Future technological and social changes may further change this balance, or shift the equilibrium (as illustrated in Figure 1).

1.3 Theories and methods: Three levels of granularity

Making open systems, data and resources freely available for educational initiatives provides a strong narrative for the power of Open World Learning. This relates closely to the mission of The Open University (“to be open to people, places, methods and ideas”), and how to best support open education (e.g. through technology) is an area in which the OU and in particular CREET are world leading. CREET will allow us to bring together networks of expertise from across the institution with different but complementary perspectives from education, the social and physical sciences, the humanities and business studies to investigate specific aspects that, considered together, will contribute to realising the potential of learning in an open world. Possible research questions for the 18 doctoral students within OWL on the three levels are illustrated below:

1. Macro level: at a Global, UK and national level
   - How do open education resources change the role of educational providers, such as schools, universities, or publishers? (i.e., people, practices)
   - How can Open World Learning in an international development context enhance human capabilities and promote human welfare? (people, places)
2. Meso level: at (cross-) institutional, cross-discipline, cross-level
- How do open world technologies influence different learning happenings in cities and how does this manifest itself in pedagogies around cities? (places, practices)
- How can Open World Learning (e.g. OER and MOOCs) be used to enhance the quality of teacher education in India and contribute to sustained, contextually appropriate pedagogic change? (places, practices)
- In what ways do big data analytics deployed in Open World Learning result in new forms of social stratification and entitlement? What are the distributive justice consequences of these decisions? (properties)

3. Micro level: within institutional, at discipline or modular level
- How can educators promote open dialogues with students to enhance their self-reflection and learning? (practices)
- How do learners’ offline practices impact on their learning with Open World Learning systems? (people, practices)
- How can practical inquiries in the virtual OpenScience Laboratory be designed so that they aid concept formation? (properties)
- What challenges are faced by learners who have diverse backgrounds and abilities, when it comes to developing mobile literacy? (people, practices)

This evidence-based programme will approach these changes from a critical and empirically-informed perspective using the different macro-meso-micro lenses. To systematically connect these complex differences, an Open World Learning framework will be utilised (see Figure 1). In this research model, a complex web of 18 PhD projects will be generated, thereby simultaneously providing a holistic and fine-grained understanding of Open World Learning. Based upon an initial inventory of conceptualisations, ideas and potential PhD proposals about Open World Learning from 25 leading academics across the OU, Figure 1 illustrates how ‘popular’ each of the four themes were (i.e. the darker the colour, the more supervisors opted for that particular theme) and at which levels of granularity doctoral studies were suggested.

Figure 1: Open World Learning framework
Most conceptualisations focussed on the enabler themes of People and Places, primarily on a meso and macro level, as illustrated on the left of Figure 1 by darker green colours of the respective building blocks. At the same time, substantial new unchartered territories in the enablers of Open World Learning are visible in Figure 1 (as illustrated by the lighter coloured building blocks), primarily focussed on Practices and Properties of Open World Learning. In order to push the research boundaries of OWL, we will actively encourage PhD students and supervisors to select topics located in these (unchartered) building blocks.

Several proposals also focussed on the disabler themes of Open World Learning on the right of Figure 1, primarily around People and Practices. The “tensions” within and between the enabler and disabler themes may shift the equilibrium more to the left or right, or change the Open World Learning model (i.e., size and shape of the dashed OWL box). For example, a change in legislation in China to make their internet open and accessible (Places, Macro) may enable millions of users to engage with open learning resources, which will also influence the other building blocks. Each PhD project will involve at least two building blocks of Figure 1, but most likely will take a combination of pathways using several building blocks at the same time. Traditional research councils will require researchers to focus only on only one or two building blocks in Figure 1, thereby limiting potential cross-disciplinary research synergies and holistic understandings of Open World Learning. The Leverhulme Doctoral Scheme would allow us to make substantial progress in developing a new research field of Open World Learning.

A range of conceptual frameworks will be used in the OWL programme, such as sociocultural theory (learning as a social activity situated in a cultural, historical and institutional context)\(^2\)\(^-\)\(^4\); socio-constructivism (with its focus on knowledge creation by people in groups); and connectivism\(^2\)\(^5\)\(^,\)\(^6\). The last of these in particular is often regarded as a learning theory for the digital age as it (i) views learning and knowledge as emerging from a diversity of opinions and information sources; (ii) holds that the key to learning is the ability to make and maintain connections between fields, ideas and concepts; (iii) envisages both individuals and organisations as organisms engaged in a continual process of learning; and (iv) regards ’know where’ as being just as important as ’know-how’ and ’know-what’. Other theoretical frameworks will include social justice (raising questions around what this means in a globalised world\(^7\) and how education can support it), and critical theory\(^7\)\(^8\) (emphasis on authenticity and reflection). Activity theory\(^9\), communities of practice\(^1\)\(^0\), community of inquiry\(^8\)\(^1\), and social network theory will also be key concepts underpinning the programme\(^8\)\(^2\).

Each of the 18 PhD studentships will use one or more of these theoretical lenses, which will allow us to provide a holistic, cross-disciplinary perspective on Open World Learning. Anticipated research approaches are data driven (e.g. by using learning analytics, design-based research, grounded theory), people-centred (e.g. by employing participatory design) and tool-driven (e.g. through activity theory) approaches enabling the programme to advance new methodologies that can be used to explore learning in an open world. At the level of knowledge building, these will be used to bring together evidence, advance knowledge and facilitate the exploration of different perspectives.

2 Integration with existing initiatives

The Open University is an active partner in several EU Training Networks and in four Doctoral Training Centres (DTC): Design Star and CHASE (Consortium for the Humanities and the Arts South-East England), both approved by the AHRC; CENTA (Central England NERC Training Alliance); and the EPSRC-funded Centre for Doctoral Training in Nuclear Energy. As their names suggest, these Centres bring together expertise in humanities, design, environmental sciences and nuclear physics. The OU’s presence in these doctoral training centres testifies to its capacity to develop the intellectual leaders of the future and collaborative strengths with other universities, research organisations and industry. It also illustrates our capacity to lead national and international research agendas. The Leverhulme
OWL proposal would provide a welcome cross-disciplinary integration programme for PhD students to transcend the boundaries of current DTCs and respective “silos” of departments.

The OU’s DTC participation means that the university is working closely with other leading research institutions, sharing supervision and training capabilities. The OU provides excellent systematic and discipline-specific research training, both face-to-face and leading the sector in online and blended doctoral research training, including our ground-breaking Virtual Research Environment. The OWL programme will be part of The Open University Graduate School, which will provide the infrastructure to ensure the highest quality of training, supervision, facilities and welfare. It will also help to support researchers in the specialised interdisciplinary areas that Leverhulme Doctoral Scholarships might most profitably support. PhD students will be trained in their respective discipline as well as in a combination of quantitative, qualitative and mixed research methods and approaches. Transferable skills (e.g., communication, research, critical thinking, public engagement) will be nurtured through our interdisciplinary network of supervisors and PhD students, supported by the training programme offered in the Graduate School. From the start of the programme, the 18 PhD students will be actively encouraged and supported to present, discuss and publish their ideas, conceptualisations and findings within the academic community and the wider public.

The programme will be coordinated from CREET, which is currently home to the largest community of postgraduate research students at the Open University (almost 200). They form a compact, cohesive research community. A successful CREET-based programme of Leverhulme Doctoral Scholarships, focusing on learning and living in an Open World, would present multiple opportunities for interfacing with existing DTCs, enabling mutual enrichment. It would create further opportunities for research in areas such as citizen science, the application of open data to developmental issues, learning analytics, cybersecurity, mobile and ubiquitous technologies and informal learning.

3 Sustainability and impact
The funding of Open World Learning proposal by Leverhulme will leave a legacy in four different ways. First, the concerted efforts of a programme of research conducted by 18 students will make an important contribution to the understanding of Open World Learning in terms of learning and knowledge and to the identification of the challenges connected with this and their solutions. It will help us to find out what role technology plays in learning in an open world, and what the possible responses are to these challenges.

Secondly, the staff and student experience gained in five years of Leverhulme foundered cross-faculty working to support 18 students tackle interdisciplinary research will leave a legacy of valuable experience in constructing and working in interdisciplinary teams to think creatively and solve problems. These working practices are needed to tackle the interlinked, complex problems of the 21st century. One of the strengths of The Open University is the availability of unique laboratory facilities, such as our Jennie Lee Research laboratories[83], for studying and recording remote and on-site participants.

Thirdly, the resources placed alongside the Leverhulme grant by the OU will fund studentships for three students from lower and middle income countries (e.g. India, Bangladesh, Ghana). This will broaden the experience of the cohort each year as well as the reach of the research programme to include geographical areas where the challenges around open learning are greatly augmented.

Finally, there will be a direct legacy of the scheme in the contribution of a total of 18 trained researchers to UK capability in researching the complex and interdisciplinary topic of openness, graduating as agents of change in an increasingly dynamic education landscape. They will also be able to multiply the impact of the OWL programme by training the next generation of researchers.
The Open World Learning programme will further enhance the OU’s capacity and reputation as a world-leading research institution on issues relating to technology-supported open distance learning, which will help attract additional funding from alternative sources for OWL’s continued growth and impact beyond any initial funding from Leverhulme. For example, this initiative could help strengthen the OU’s existing relationships with donors, such as The William and Flora Hewlett Foundation and The Wolfson Foundation, as well as leverage additional support through new external funding opportunities. Knowledge derived from research conducted through the OWL initiative could also inform OU and wider teaching practices and policies so that learning opportunities are more relevant and accessible to 21st century learners today and in the future. OWL may help to inform the policies and decision-making that is vital to ensure that access to digital, open learning is a positive force in society.

4 Additional institutional support

The Open University undertakes to provide additional funding and resources to support the students recruited as Leverhulme Scholars and ensure a future legacy. Overall we estimate that this represents matched funding from the University of over £1m based on meeting overhead costs not funded by the grant (£42,500 per student totalling £637,500) and direct investment in infrastructure and further studentships of more than £450,000.

In particular we have identified three areas where we expect to apply additional resources. Firstly, the OU will meet the proportion of full economic costs not met by the grant. These exceed the direct costs and living expenses for each student as funded by the grant and will be covered by the University. Secondly, we will operate a distributed model with interdisciplinary supervision across faculties but supported by the infrastructure of CREET (pastoral care, monitoring, reporting and integration) and of the OU Virtual Research Environment (social presence, development, and training)\(^4\). This includes the unique laboratory facilities and equipment for studying and recording remote and on-site participants in the Jenny Lee Building. These will be upgraded to provide world-leading facilities for the Leverhulme Scholars, including capabilities such as eye-tracking and multi-angle digital recording. Thirdly, we will commit additional funding for one further student per year, allowing us to recruit 6 rather than 5 students per year. The additional studentship each year will be focused on encouraging participation linked to higher education institutions in low and middle-income economies.

5 Academic Staff

The Open University has more than 1000 research students registered for postgraduate degrees, with almost 200 doctoral students located within CREET. Based upon a university-wide call to participate in the OWL programme, a mix of promising and world-leading experts from five different faculties (Business and Law, Education and Language Studies, Institute of Educational Technology, Science, Social Sciences) have come forward to contribute to this programme by providing interdisciplinary PhD topics and acting as future supervisors. Most academics have extensive experience with successful completions of PhD supervisions, and an active community of current PhD students. With an average Hirsh index of 20.8 and 1943 citations per academic, these supervisors have an extensive track record of publishing in high impact and open access journals, and having successfully supervised postgraduate research students (n = 193, average per supervisor = 19.3 PhD students). Furthermore, most supervisors have successfully led large research projects and centres, having attracted grant income of approximately £10M+ from sources such as RCUK, EU, Government, international funders and international charities. In Table 1, a list of proposed academics who will work in interdisciplinary supervisory teams is illustrated.

Through research projects and individual contacts these academics have wide-ranging international networks in academia (not only in the UK and Europe but across the world), as

Open World Learning (OWL) 8
well as with companies (e.g., British Telecom, Google, Microsoft, Oracle), governmental bodies and other organisations (e.g., Big Brother Watch, British Council, Council of Europe, Department for International Development, Bill and Melinda Gates Foundation, Hewlett Foundation, Open Rights Group, Privacy International, Prisoners Education Trust, TESSA, TESS-India, UNICEF).

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6 Selection process

The Open University will carry out recruitment of Leverhulme Doctoral Students through the established CREET student recruitment process. Students are asked to develop their own initial proposals linked to the areas set out by the supervision teams and the OWL programme. That programme will be built from the expressions of interest already received from across the University. Each application and proposal will be reviewed prior to selection for interview. The interview will then involve a panel chaired by the CREET Director of Postgraduate Studies and typically also including the lead for the programme and members of the potential (interdisciplinary) supervision team. The criteria to be applied include:

- Fit with the research programme
- Entry level subject knowledge (i.e. knowledge of theoretical and recent research literature pertaining to the proposed research area)
- Rationale for the proposal (i.e. the relationship between the proposed design of the research, the research questions and/or hypotheses and the proposed method of analysis)
- Knowledge and understanding of proposed research methods (i.e. why certain methods have been proposed in comparison with alternatives)
- Feasibility of the research design (i.e. the scale and context of the research; proposed sampling methods; data collection methods and possible sources of bias)
- Knowledge and understanding of the relationship between analysis, interpretation and theory
- Knowledge and understanding of the ethical considerations that need to be taken into account in the conduct of the research
- Knowledge and understanding of the process of research and knowledge generation (i.e. the need for research to be generalisable and replicable).

The OWL pathway model (Figure 1) will be used as a tool to determine fit and allow The Open University to select the most appropriate level and topic for the students. The model will locate the resulting studies within the framework and so provide a coherent representation of the programme of work. This process will help identify gaps and areas of

Open World Learning (OWL) 9
particular interest, though the quality of the application will be used as the primary means of selection rather than imposing an expectation of uniform coverage of the area of interest.

The OU has an extensive track record of training the next generation of high-quality academics in the areas of education and educational technology, with existing doctoral graduates including Professor Mpine Makoe (UNISA), Professor Martin Olivier (Institute of Education), Prof Ann Blandford (University College London), and Professor Eileen Scanlon (Regius Professor at The Open University). The Leverhulme Doctoral Scholarships provide a great opportunity to boost this area at a time when the understanding of the impact of Open World Learning is of great importance across disciplines, institutions and nations.

Key references in Open World Learning from OU academics*

13. Tait A. Distance and e-learning, social justice, and development: The relevance of capability approaches to the mission of open universities. The International Review of Research in Open and Distance Learning 2013; 14(4).
16. Scanlon E. Open educational resources in support of science learning: tools for inquiry and observation. Distance Education 2012; 33(2): 221-36.

*Note: the complete list of references used in this proposal is available at: http://tinyurl.com/OWLreferences