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Title

EPSRC Centre for Doctoral Training in Prosthetics and Orthotics

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Summary

The EPSRC Centre for Doctoral Training in Prosthetics and Orthotics intends to be a leader in P&O research training and translation of research into innovation. Through a £5.5 Million award, 35 PhD studentships have been awarded and are in progress thus far, and a further 23 will follow in 2022-23.

Introduction/ basics

The ambition for the EPSRC Centre for Doctoral Training (CDT) in Prosthetics and Orthotics (P&O) is to be a leader in P&O research training and translation of research into innovation.

The Centre is the first dedicated to P&O doctoral training, drawing together expertise from the Universities of Salford, Strathclyde, Southampton and Imperial College together with industry, user and clinical partners.

Advancing the state of the art is part of the solution to the mismatch between escalating user demand and P&O workforce capacity globally. According to the World Health Organisation (1) “a major limitation is inadequate training of prosthetists and orthotists to conduct research”.

Our Centre helps to address this situation by creating a doctoral trained workforce integrating clinical, engineering, and physical science research, and connecting doctoral studies to the agenda of external stakeholders through partnerships.

Material method; implementation/ process

A 4 year PhD doctoral training model has been developed reflecting the P&O ecosystem, involving clinical and user need, business, and cutting-edge engineering science. PhD projects are developed with external stakeholders and the academic teams.

In year 1 students complete compulsory and elective modules (e.g. fundamentals of P&O; Medical Device Certification; Research Methods; Contemporary Professional Issues in P&O Orthopaedic Biomechanics; Physical Behaviour Monitoring Technologies; Health and Vocational Behaviour; Clinical Gait Analysis). They complete a training needs analysis, identify placement opportunities and requirements from external partners. Years 2 to 4 follow a more traditional PhD model. However, there is a programme of residential summer schools and a student-led student society, organising conferences, social meetings and creating leadership opportunities. Students engage with industry/clinical placements and further research opportunities outside the Centre.

Results

The strategic leadership and direction of the Centre is supported by an Advisory Group and Leadership board, comprising external stakeholders and all four Universities. These boards act as a critical friend to the Centre and offer advice and guidance based on the needs of the workforce and societal demands. Both groups are made up of academic staff from across the world, third sectors leaders and managers from the NHS.

To date 35 studentships have been awarded, 60% to female candidates. Two candidates are between 30 and 45 years of age, the majority younger than 24. 70% are of white British background.

55% of PhD projects are focused on prosthetics, 36% on orthotics, and 9% on apply to both areas. 75% of PhD projects are focused on the lower-limb, with the remainder on upper-limb. 25% have an explicit link to the needs of users in low resource settings.

Project topics reflect the underlying strengths and interests of the partner Universities and include tissue properties, device design, management of interface conditions, wearable technologies, osseointegration, composite materials, neuro-interfaces, social enterprises, user priorities in low resource settings, and outcome measurement.

Discussion/ conclusion; conclusion for the practice

The Centre continues to ensure the training of doctoral students who are ready to take on leadership roles within the P&O sector through to the next decade. Working with an increasing

number of partners worldwide, we aim to to train people and develop solutions to provide solutions for those who require them.

As more lower middle income countries and developed nations require access to suitable and affordable P&O, professionals must be not only trained with a broad range of skills but need a deep understanding of users' requirements. This includes an ability to anticipate future needs in this sector and develop fit for purposes devices, services and workforce accordingly. The recent pandemic has illustrated the need to adapt and use technologies to both train students and work with industry and universities to ensure that users do not become further disadvantaged. Representation of students and projects from low resource countries is currently lower than we would prefer and are working with WHO and ISPO to support more inclusive recruitment. We are developing plans for the sustainability of the Centre beyond its initial finance award which extends to 2027. We wish to invite partners who share our vision and passion for P&O research to contribute to these evolving plans, so that collectively we can meet the needs of the millions of P&O users globally.

References

(1) WHO Standards for Prosthetics and Orthotics, Part 1: Standards. Section 2.4 Research and development. ISBN 978-92-4-151248-0