RESEARCH IN ORTHOPAEDIC SHOE TECHNOLOGY BACHELOR LEVEL EDUCATION. NEEDED AND INEVITABLE?

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Abstract:
This article discusses the importance of fully integrating research activities into the Bachelor level programs (undergraduate programs) in orthopaedic shoe technology. To work according to evidence based principles and acquire the competences to do so it is necessary for students to engage in research activities from within the educational programme as soon as possible. Insight in what research means, what the effects are, generates a number of cross links with the stakeholders involved in Shoe technology education. Also, the interaction with orthopaedic shoe making companies is stimulated in a broader context than is traditionally the case. A structure enhancing the interaction of educational institution, companies, research groups and institutions is presented which operates at the intersection of these stakeholders. A whole new world is therefore coming into range which will generate all kinds of new and unexplored opportunities.

Introduction
To date a growing need for research is becoming visible for the Orthopaedic Shoe engineering professional. As a professional being part of a multi disciplinary team in the same way as the prosthetist and orthotist primarily has to rely on skills and knowledge obtained by years of experience and tradition. The adjacent professions such as medical doctors, physiotherapists, occupational therapists etc. by now have more a tradition in research and evidence based practice compared to the Orthopaedic Shoe Technologist.
More proof of effectiveness of orthopaedic shoe devices and scientifically based selection procedures and protocols are needed. More effort will be needed in obtaining and collecting evidence which can be used to account for the expenses associated with particular devices or therapy. Besides that, research and evidence based techniques are needed for the Orthopaedic Shoe Technologist to take full part in multidisciplinary teams. To catch up with the Prosthetics and Orthotics related disciplines whom all have a long experience in working with evidence based medicine / practice it is necessary that the Orthopaedic Shoe profession will adapt this way of working in the same way as the P&O profession (Ramstrand et al, *2008*). This will set a large demand on the research competences of the novice professionals. Educational programmes thus have an important role in familiarising students with research as well as with evidence based techniques.

The provision of research based education at all levels is a particular strength of Europe and Europe's universities. Institutions offering research based higher education should ensure that a research component is included and developed in all cycles. (Lisbon declaration, 2007). This allows students to acquire research experience.

It is in this perspective that a lot of effort has been and will be put into the research programs of educational institutions. Research and Innovation is therefore a spearhead in the Bachelor program Orthopaedic Engineering of the Fontys University of Allied Health Professions.

Method
In the Netherlands the educational system at University level consists out of two grades, Bachelor and Master level. To date also Bachelor programs are fully involved into research programs by research groups indicated as "Chairs" which have been formed to realise the above mentioned concepts and ideas.
The Fontys University of Allied Health Professions, of which the orthopaedic engineering program is part of, has now a Chair in Health Care & Technology for Quality of Life.

Integration of students into research can be realised by making them part of the research program themselves as a participant. If within the curriculum study time is reserved for research activities starting in the first year with attention for the basic principles for research ending at the final year doing a final project work (partly) linked to a research program, then students can obtain the necessary research competences. Next to this they will have been part of a large research network group. Because they also will have experienced the collaboration between the different institutions and companies they will be themselves part of a knowledge transfer in a most natural way. They become the personification of the term "knowledge transfer on legs".

Results
The formation of a research group, the Chair, within the educational context and curricula made it possible to come up to the necessities and expectations mentioned above. During the past years a number of research projects proceeding from out of the University have been realised as leading partner or as a participant in larger research programs. Research projects involving the active participation of students and performed by teachers, associate lectors, and lectors in collaboration with other research institutions, knowledge centres, industry and orthopaedic companies / institutions have been established.

Conclusion

Introduction of a research facility in the form of a chair is enrichment in improving curricula, skills, and knowledge as summarised in competences of students. The outcome of these research studies generates evidence, which then can be used to improve processes, therapies or the design of orthopaedic devices. Therefore it can be fully confirmed that Research in Prosthetics and Orthotics Bachelor level Education is needed as well as inevitable in the current evolution of educational processes.

References
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