

Tissue engineering with an educational twist

December 22 2015, by Karin Weijdegård

In his doctoral thesis Patric Wallin, at the Department of Physics, Chalmers University of Technology, combines research from tissue engineering and engineering education. He finds that merging the two is beneficial in many aspects and that integrating research and education can be an effective tool for enhancing student learning and development.

Tissue engineering is a rapidly developing field with great promise for medical applications such as organ transplantations and testing of new medicines. The tissue engineering course within the Biotechnology Master Programme at Chalmers uses an inquiry based learning approach, where the students work in groups on real research projects in real research labs rather than in training labs.

"When I started teaching the course I saw that something very special happened there. The students were extremely motivated, worked hard and seemed to really enjoy it. It was the first time they experienced working on and taking responsibility for a real research project," says Patric Wallin, who became interested in what awakes student's interest and enthusiasm.

Capable when given responsibility

Based on evaluation surveys and in-depth interviews with students, Patric Wallin extended the scientific part of his thesis – a study on how the cells move through the human body, what causes them to move and how they interact - with a second part dealing with the learning experience of the students, who within the tissue engineering course also had been

involved in the scientific work of the first part of the thesis.

"Some may think it would be risky to let master students into our research labs, but what I found is that they are perfectly capable of handling the responsibility we give them. Introducing them to a community of practice gives them self confidence and a sense of identity as researchers. They understand that knowledge is not absolute, but rather something that might change over time, and that also gives them resilience towards set-backs that undoubtedly comes up during the projects."

Positive feedback from the industry

Being a research driven field, the students of tissue engineering often continue doing research even as they leave academia for industry. One of the positive outcomes of the inquiry based learning approach, beside being personally developing for the students, is that it seems to fit well with the demands of the industry.

"Some of our students went on to write their master theses at AstraZeneka and the feedback we get from their supervisors is that they are very easy to work with because they have a good understanding of the process of research," says Patric Wallin.

The merging of two disciplines

To combine different research approaches such as social sciences and humanities with natural sciences is not very common, but Patric Wallin sees each as necessary parts that complement each other and that such an approach will become increasingly important when tackling societal problems in the future. Technology alone will, for example, not solve issues like energy, water or food distribution where behavioural changes

are necessary to put the technology to use. Vice versa Patric Wallin argues that he would not have been able to study how students become researcher within the tissue engineering field if he didn't also have a practical experience and deep understanding of being a researcher within that discipline.

"If I had only focused on the educational part I don't think I would have been able to ask the same questions because I had not understood how the research process in [tissue engineering](#) works. For me it was very enlightening to see how two different ways of doing research came together and I came to understand that both are equally important."

Provided by Chalmers University of Technology

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