

ZEISS Digital Classroom

University of Tartu, Estonia

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Get inspired at University of Tartu, the student capital of Estonia. Estonia is one of the smallest northern European countries and has one of the most successful Universities, the University of Tartu. Founded in 1632, the university is older than Universities of Harvard and ranked in the top 1% of the world's most-cited universities and research institutions. The concept of Digital Classroom supports the universities goal to inspire students for Sciences. In addition, Estonia is a front runner in applying digitalization in daily lives, since digital transformation is clearly on the political agenda and part of the strategy to push Estonia into the forefront of modernization within Europe.

Martin Kärner at the Institute of Molecular and Cell Biology (IMCB) was immediately impressed by the concept of Digital Classroom. Therefore, the Institute invested in a digital classroom with 16 Primo Star HDs to teach the students. The digital microscopy class aims to develop student's practical skills in Histology, Developmental biology and related disciplines. The setup, connected to the local Wifi network enables viewing and recording of microscopic images on large screen and by iPads and iPhones and to share the pictures through social networks and electronic mail. In addition, ZEISS Axio Imager.A1 with set of Plan-Apochromat objectives and AxioCam 512 color became a part of the classroom. Axio Imager enables visualization of finest details of histological slices and shows high-resolution picture to the audience.

Heiti Paves from ZEISS partner company Optika & Diagnostika describes how the first digital classroom project in Estonia come forward

Initial idea was from Mr. Martin Kärner, lecturer at University of Tartu. He has taught histology and developmental biology at the Institute of Molecular and Cell Biology for years. Practical training is an important part of the studies, and light microscope is an essential tool to learn the structure of animal tissues. It is also very important that each student must get skills to find and recognize the tissue structures.

The only criterion of correctness of student's decision is expert opinion of the supervisor. So, the supervisor must have a look at most of view from microscopes of all the students.

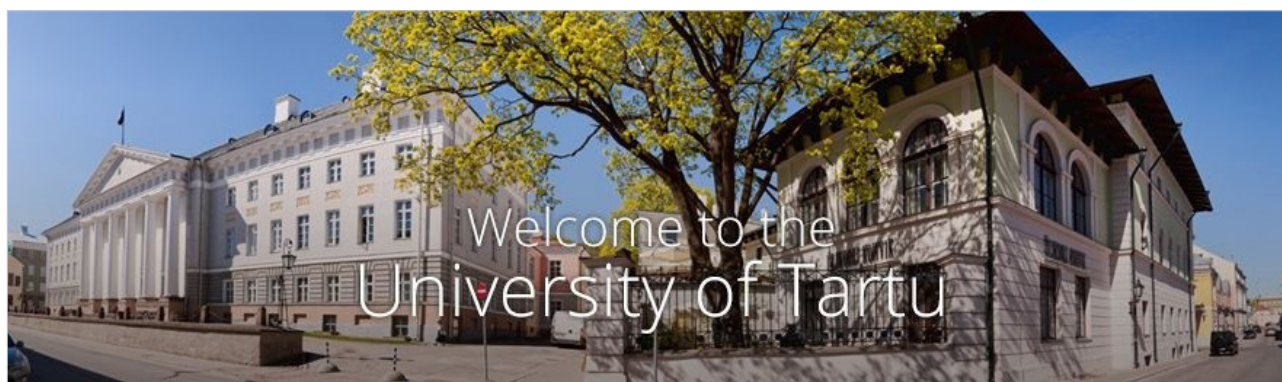


Figure 1 University of Tartu



Figure 2 From hand to brain: drawing finest structures supports learning results.

One can imagine the amount of time spent on examinations: the teacher has to go to each working place, sit down, re-install eyepieces, and have a look. There are usually 12 – 16 members in a group of students.

The benefit of digital Classroom is easy to understand

Digital classrooms gives the possibility to get the views from all microscopes simultaneously, pick up and examine more closely any of them, to give the expert opinion, and to show the picture on large screen to all students. Lecturer Martin Kärner is very happy to have the digital classroom. Studies has been improved into three directions: "Here and now we've stepped three steps forward at a time. These three are the time, quality and synergies. Now there will be more time to deal with students. If one person sees something other than the product, we can look at it all together and analyze it. So far, such an opportunity lacked."

Professor Toivo Maimets, Director of the Institute of Molecular and Cell Biology, adds: "The class became furnished with new microscopes facilitate teaching to improve quality, enhance student satisfaction and further broaden the opportunities of students."

And indeed, the students are engaged as well. Beside of nice view through high-quality optics they get fast feedback from the supervisor and other students. Moreover, making and taking home pictures is easy using SD card or iPhone/iPad. Handling of a light microscope is also an important part of studies: although Primo Stars with built-in network cameras are quite modern instruments, they still have classical path of light: full-Köhler illumination and adjustable eyepieces. So, the students must also learn the basic theory and elementary tricks of work to get optimized picture from transmitted light microscope.

Installation of the Digital Classroom was an event that has given a lot of experience to the University of Tartu. Optika & Diagnostika, ZEISS partner and importer of ZEISS microscopes has also gained important know-how about creation and composition of a functional classroom. The most important message from the first installation is: the Digital Classroom is not just a set of microscopes placed on existing furniture but rather tailored system, made of Primo Stars (or stereomicroscopes Stemi), "fundamental particles" of the classroom. Fitting together the microscopes, tablets, smartphones, and routers into functional network requires intense collaboration with the customer to achieve the real difference between the Digital Classroom and a microscopy room.

Digital Classroom has been acquired in the University of Tartu Astra project PER ASPERA and with support of the Molecular and Cell Biology Institute and the assistance of the Ecology and Earth Sciences Institute.



Figure 3 Professor Toivo Maimets, Director of the Institute of Molecular and Cell Biology.



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