# meet the teacher

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## Dr. Kinshuk
## Engineering a better education

Dr. Kinshuk's research is about systems adaptivity and personalization in mobile learning, which in language the rest of us will understand means creating a better, more authentic learning experience for students without increasing instructor workload.

"I'm not interested in research for the sake of research," said the director of the School of Computing and Information Systems at AU and the iCORE/Xerox/Markin industry research chair. Kinshuk is also the editor-in-chief of the Journal of Educational Technology and Society and founding chair of the Institution of Electrical and Electronics Engineers' technical committee on learning technologies.

"This work is about using the technology in intelligent ways to identify the individual characteristics of student requirements and provide feedback directly to students. It's about giving students a better learning experience."

As the student works at a computer or mobile device such as a PDA or cell phone, the system can automatically gather information about the learner, such as learning speed, short-term memory, recall, current knowledge, whether they prefer verbal or visual presentation, whether they are reflective thinkers or active, what time of the day they tend to work on their studies and so on. Then the system combines the learner profile with factors related to a student's location, device and situational context and customizes the content and presentation of the lesson or the website to provide him or her with a personalized learning experience.

When doing his Ph.D. in the 1990s, Kinshuk was working in the area of intelligent tutor systems — technology that was expected to replace teachers. "That didn't happen because you cannot replace the human interactive experience with a machine. So intelligent tutor systems evolved into adaptive learning systems."

The adaptivity and personalization research has two aims: to broaden access to learning for students in remote and northern areas and to create authentic learning that combines real-life objects in the individual's environment with virtual learning content.

To do that, a number of factors are assessed: the learner profile (including background, learning styles, behaviours and preferences), the learner's location, the specific situation, including what real life objects are available and who else is there that will contribute to the learning process, and, finally, the device profile, which includes information about the device (whether desktop, laptop, PDA or cell phone) being used. Then the content, the presentation and the activities can be customized accordingly for each specific learner.

And this is done without creating more work for instructors, Kinshuk said, by using the content they already have.

"The system can provide the instructor with overall information about the students so they can better design lessons according to the preferences and choices of the various types of students. The system is then able to provide more quizzes for one, more hands-on examples for another, and more discussions and group work for someone else."

Kinshuk's interest in computer technology began to develop in the late '80s at the end of his first year of undergraduate studies in mechanical engineering in India. "That first summer I went over to the computer lab and asked for access to a computer. They gave me three chapters to read and said to come back next week. When I showed up the next day, they saw I was seriously interested."

"I think both students and faculty bring a lot more to the research team in a distributed environment than they do . . . face-to-face. People living and working in different geographical locations have very different experiences and the research benefits from that diversity. Most of our students are working and have very strong practical experience in the area of research. Many more minds can be brought together on a project via the Internet. And when we are all over the world, the work continues 24 hours a day."

His short-term goal is to create a better learning experience, with people accessing whatever learning tools are in their environment — what he refers to as "just in time, on demand learning."

His long-term goal is somewhat difficult to imagine. "The ultimate aim — and this might not happen in my lifetime — is an environment in which learning happens so automatically, in such small amounts, that you don't even notice. The environment will be so intuitive that every action contributes to learning. People will get exactly what they need, right at that moment and it will happen in such a natural way that people will say 'So what?' No explicit action is needed; it just happens here and now."

The applications and the benefits may boggle some minds. But not Kinshuk's. In his world, system technology is definitely our friend.

Photo: Ed Ellis

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