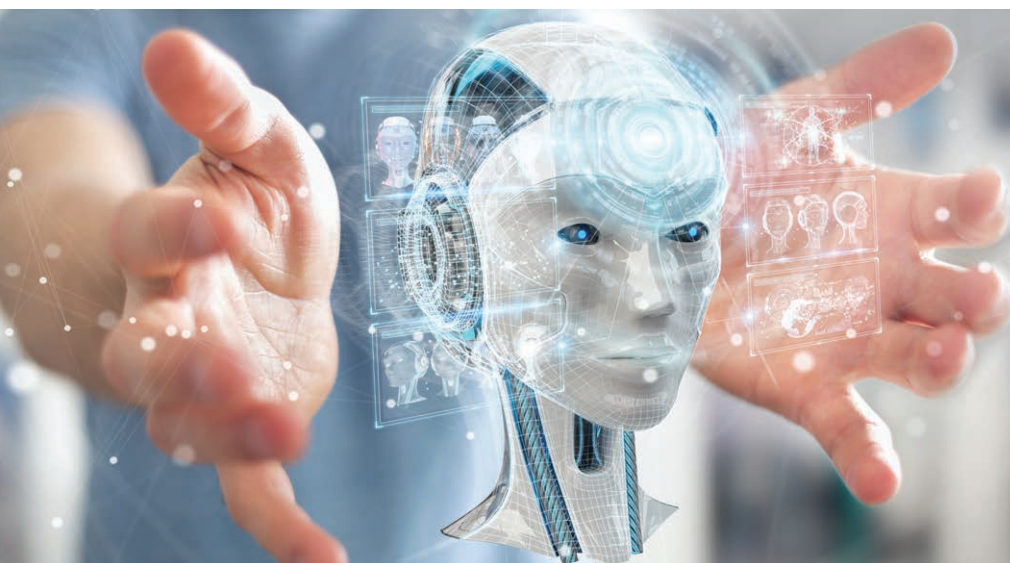


## Engineering, Built Environment and Information Technology



### Which issues are at stake to ensure that the University of Pretoria remains relevant and competitive in the next industrial revolution?

*By Prof Hanlie Smuts*

Imagine it is 16 years ago. Imagine you have to explain to a friend what a selfie is, what a hashtag is or what a drone is and which jobs are relevant to these marvels? The 4th industrial revolution and digital technologies that are influencing the way we live, work and play have not only impacted existing professions, but have created new jobs as well! Therefore, the question is, how does UP stay relevant and competitive in preparing students for jobs that do not exist yet? What should we at UP do differently to give students the skills they will ultimately need for work?

Rapid changes in the commercial environment, changing industry demands, new market trends and changes in technology have a direct impact on effective learning for students and how effective they will be in the workplace. Students need to stay relevant in a market where technology, methodology (techniques and approaches to develop new systems) and industry trends change quickly. Here are three things that we focus on at UP to ensure that we achieve this outcome.

#### Blended learning and experience

Academic programmes are designed to present basic building blocks, create associations among the building blocks and then apply the knowledge gained through the process. This capability is demonstrated through specific projects that deliver real-world business solutions. A blended learning approach incorporates theoretical and experiential learning. It includes academic modules, critical thinking, problem-solving and enables through immersive learning experiences. A focus on virtual learning spaces in extended reality (XR) has the potential to create more engaging and personal experiences for learners than any current developments in online course design.

#### Think differently about skills

Rather than only focusing on mastering programme content that might be irrelevant in the near future, we enable students to also focus on learning processes where learning becomes an act of discovery. Students are coached and work as part of a team to solve specific issues or work on defined projects, developing a variety of skills.

There is a focus on understanding and examining the given problem, researching the problem background, analysing possible solutions, developing a proposal and producing a final result. During this process, students develop a greater understanding of relevant and contextual course content and skills, and the required critical thinking abilities to produce the final result. In learning processes like these, students engage in active learning that leads to mastering changing academic content.

#### Interdisciplinary knowledge

Interdisciplinary education merges components of two or more disciplines into a single programme around common themes, issues, or problems. This focus allows students to learn by making connections between ideas and concepts across different disciplinary boundaries. Let us think about human-computer interaction in this connected

world we engage in. By exposing students to this multidisciplinary field of study focusing on the design of computer technology and, in particular, the interaction between humans (the users) and computers, they are enabled to think about this touchpoint holistically, for example placement of information, use of colour, reading strain, intuitive navigation, use of symbols, etc.

Interactions between computers and humans should be as intuitive as conversations between two humans, and interdisciplinary knowledge supports the achievement of this.

While advancements in machinery and technology first provide graduates with the tools to explore, experiment and find interesting solutions to complex problems, it will also open up a world of new career opportunities, asking for a new mix of skills. Our focus at UP is to prepare you for both of these instances.