NEW APPROACH TO TRAINING

Traditional ATCO training has always been considered expensive. Finavia Avia College is challenging this belief by offering cost-efficient, qualitatively excellent training.

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Avia College is a school of air navigation training located next to Helsinki Airport in Finland. It offers initial and continuation training for air traffic controller officers (ATCOs) and flight information officers, and also trains air navigation engineers and technicians. The curriculum of the school follows Eurocontrol's ATCO common core content and international regulations, as well as the quality standards of the Finnish Transport Safety Agency. The college is owned by Finavia, the service company that maintains a network of 25 airports in Finland and the air navigation system covering the entire country. However, Avia College is an international school: training, student coaching and accommodation services are all offered in English in addition to Finnish. Furthermore, the college is vigorously developing its training operations and establishing new service concepts to meet the needs of international customers.

Educational development
The goal of Avia's educational reform is to decrease the costs of ATCO training while improving the safety impacts and quality of training. Student-centred methods and carefully planned use of learning technologies decrease teacher involvement and increase student commitment throughout the learning process. Continuous assessment of student achievement and quality are highlighted in the process.

The educational development recently carried out at Avia is based on scientific research and collaboration with national and international universities. The reform of educational practices is in line with the quality assurance programmes of the Finnish National Board of Education and Ministry of Education. The quality requirements of Finnish educational authorities and their effects are perhaps best known internationally through Finland's excellent score in the OECD PISA surveys. Finnish students have consistently achieved the best-ever, or near the best, results in these surveys (2000, 2003, 2006).

Student-centred learning
Avia College has a long tradition of simulation-based learning and has built up a high level of skill in this area. Authentic and simulated learning processes are deepened by collaborative debriefing methods. The college's ATCO instructors and course developers are currently implementing more student-centred and project-based methods in their teaching, such as inquiry learning (Hakkarainen, 2003). The latest in learning technology and e-learning is used to support the educational practices meaningfully and efficiently, and effectiveness of teaching methods is assessed continuously.

The college is planning a new learning environment concept for future training facilities. The design principals are based on the educational needs of ATCO training. For example, designer Mats Lönngren (2010) has innovative visions of an engaging working environment that pays attention to students' needs for collaboration and knowledge-sharing space as well as for concentrated 'quiet' learning.

Striving for professional excellence
Avia College has begun new research into ATCOs' professional excellence. The goal of the study is to find and describe qualifications, competencies and predictors that define excellent ATCO working practices, procedures and problem-solving skills in the work context. Another research goal is to describe the role of initial and continuous training in supporting and further developing professional excellence.

The research questions are answered using theoretical concept analysis, interviews (ATCOs, on-the-job training instructors and managers) and survey study (analysis of empirical data including incident reports, entrance test data and study records).

Researcher Petri Nokelainen (2007; 2009) and his colleagues have studied professional excellence in the context of mathematics (Finnish and US Academic Olympiad teams) and manual skills (Finnish World Skills Competition team). The researchers found that the most important personal characteristics for vocational excellence were self-reflection, cognitive skills, motivation and social skills.

Human factors in unexpected situations
Although ATM relies widely on automation, humans are expected to remain as the central part of the system. This requires research and development into human factors such as training and competence. Avia College's research of ATCOs is focused on finding out what qualifications and competencies may define safe and accurate working and decision making in...
everyday as well as unexpected situations. According to earlier incident investigations (Safety and Quality, Finavia 2008; 2009; 2010), literature and research findings human factors play a crucial role (Wiegmann and Schappell, 2003).

The most important human factors are believed to include communication skills, efficient problem solving, shared situational awareness, simultaneous capacity and coping with personal workload. On the other hand, human factors specialist Anna-Maria Teperi has concluded that similar deviations and incidents have been recurring for decades (see also Schroeder et al., 2006). This raises the question: do we learn enough from deviations and incidents and the factors causing them? (Teperi and Leppänen, 2010) And do we use these lessons learned in ATCO training?

Implementing research results
Training operations and educational development at Avia College will benefit from the research results regarding qualifications and predictors of professional excellence of ATCOs. For example, in entrance tests the predictors of professional excellence are taken into account. Clearly, the research results surrounding professional excellence, implemented in customised ATCO training, will advance safety by improving the quality of air traffic navigation services.

References