

# The ITS skills gap – a European challenge

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**W**hile there may be no consensus about the precise skills that are required to make a fully qualified ITS professional, there is one thing that everyone can agree on. There is a serious skills gap in the industry and gap is widening. And, as ITS moves from R&D to practical implementation, the consequences of that skills gap become ever more apparent.

No-where is this gap more in evidence than in South Africa where decades of neglect, in terms of training engineers, has coincided with a bonanza in transport infrastructure investment. The government has committed Euro 40 billion on projects such as the Gautrain rapid rail link between Johannesburg and Pretoria, the bus rapid transit systems for Johannesburg, Pretoria, Port Elizabeth and Cape Town, airport upgrades and freeway management projects.

Paul Vorster, CEO of ITS South Africa, says that there is a shortage of between 6,000 and 12,000 civil engineers as well as significant shortages in electrical and mechanical engineering. 'The ITS profession draws heavily on civil engineering for practitioners in the multidisciplinary field of ITS and we therefore suffer from ITS skills shortages we well.'

To tackle this gap ITS South Africa has established an ITS Centre of Excellence to assist as a delivery mechanism for strategic ITS projects. On-going skills development is one priority and is addressing short-term needs. But another priority is ITS education which can only deliver high-level skills years into the future. He says the ITS Centre of Excellence is an appropriate tool to address the strategic challenges whilst also addressing the needs of skills development. He adds that ITS South Africa has entered into discussions with various local and international partners to assist with skills development and education programmes.

While the crisis in South Africa may be extreme, the skills gap in Europe has long been recognised both at EU and at a national level – but the solution remains elusive. Which makes the latest Europe-wide initiative, ITS-EduNet, all the more important.

ITS-EduNet is a self-sustaining pan-European organisation that aims to strengthen scientific and technological excellence in ITS by offering teaching resources and the exchange of knowl-



**Southampton University - a founding member of ITS-EduNet.**

edge on a continuous basis at the European level. The network currently consists of ten universities and research establishments across Europe. The aim, ultimately, is to have at least one institution from every Member State with additional members from the larger countries.

Professor Fritz Busch of Munich University is the current president of ITS-EduNet and he says that the rapid increase in demand for up-to-date information and training in transport topics makes the network very timely. 'The general awareness of society and economy towards

mobility and its related, very wide-ranging aspects such as pollution and the environment, welfare and individual comfort, safety, finance, etc, is constantly increasing. Solutions, systems and the whole context are becoming more and more complex. We need "life-long learning" in this domain more than ever.'

He believes that the strength of the network lies in the fact that it brings together a number of academic institutions, each with its own areas of expertise. 'The network ITS-EduNet is much stronger than its individual partners as it com-

bines the specific and dedicated expertise of very different and renowned parties and persons. In due course the network should be able to offer the complete ITS-knowledge base with all its facets and even national peculiarities.'

ITS-EduNet has its origins in the ROSETTA project, a 5th framework ITS programme which was concerned mainly with the future requirements for ITS in Europe. One strand of this project was concerned with education and training for ITS and one of the conclusions of the project was a recommendation to set up an ITS education and training network in Europe.

This was ITS-EduNet which was initially set up in 2004. In order to get the network established, and to develop an organisational framework for its operation, funds were made available from the Leonardo Da Vinci programme. This money was used to fund the ETNITE (Education and Training for ITS in Europe) project involving 13 partners across Europe, which examined in detail how the network would work. One of the key decisions to emerge from ETNITE was to establish ITS-EduNet as a legal entity and in November 2007 it was set up as a non-profit association.

The objectives of ITS-EduNet are:

- To define recommended educational curricula
- Create new teaching material and organise short training courses
- Exchange information concerning teaching curricula, training courses and other related activities and events
- Explore a potential system of international accreditation for recognised ITS courses
- Facilitate the exchange of teachers and students
- Disseminate research results through their incorporation in training and education programmes



Paul Vorster, CEO of ITS South Africa

- Prepare and implement joint studies and reviews
- Establish a centralised source of information regarding the network

Fritz Busch recognises that having worthy aims is not enough to guarantee success. 'Of course we do not expect a sudden "success" of the network – it has to live from itself and get its strength from itself and its offers for the ITS market – otherwise it will disappear after some years.'

Nick Hounsell of the Transportation Research Group (TRG) at Southampton University has been involved in the project since the outset and Southampton are one of the founding members of ITS-EduNet. TRG were a partner in ETNITE and were responsible for organising a two-day crash course in road traffic management and ITS which took place last year. The course was aimed at local authority decision makers and control centre managers who are involved in the pro-

curement of ITS systems for road traffic management. The first day was held at the University of Southampton and the second day at the ROMANSE traffic control centre where delegates had access to the live technology and infrastructure.

The aim of the course was to trial and validate innovative learning and teaching methods which had been developed in ETNITE. Nick Hounsell, who organised the course, says it was a showcase for what can be done and was a great success. What is not clear, though, is whether this is a viable business model – would people be prepared to pay? The reality that all members of the ITS-EduNet network have to face is that academic institutions can only afford to put on the courses that attract students and there is still uncertainty about what industry requires from its professionals and what it is looking to recruit.

It was this uncertainty that led ITS (UK) to set up the Training and Development Task Force in 2006 to look at how the increasing demand for ITS skills will be met in the future. The Task Force came up with a number of recommendations including revisiting the idea of setting up a Masters level training packing in ITS. This was first submitted to the EPSRC for financial support by a group of UK Universities in 2000. Unsuccessful at the time, the Task Force believe it was an idea that should be revived on the basis that an ITS-specific course, supported and recognised by industry, could be a flagship for the ITS industry and help identify ITS as a specific career choice. It comes back, as always, to funding.

In Sweden, with a World Congress on the horizon, ITS is a hot topic, and ITS Sweden have been able to tap into this enthusiasm and raise Euro 2 million of funding to set up six post graduate studentships. Christer Karlsson, CEO ITS Sweden, says the skills shortage will be noticeable in some years if we do not act now. 'The Swedish Road Administration started running courses in the early 90s for people from other disciplines who needed to understand traffic management. But is clear that we need to get more fresh, young people into ITS because there is a fear for the future that we will not have enough people with the knowledge to continue to develop ITS.'

The postgraduates, who are on four-year placements with six top Swedish universities. They are sponsored by three bodies, the Swedish Rail Administration, the Swedish Road Administration and Vinnova, a government body which manages research funding. ITS Sweden provides the secretariat and manages the contracts with both the sponsors and the academic institutions. Christer Karlsson explains that the current funding package is only for this batch of students but there is optimism that this might lead to funding for further students down the line.

One of the recommendations to emerge from ETNITE was the development of a European MSc course in ITS. This initiative has been taken up by FHTW Vienna where they already ran an

## What does the recruitment industry think?

For the past six years Simon Mattock, a Principal Consultant with IS Recruitment, has specialised in recruiting for the ITS sector. This is the period in which ITS has moved from R&D to implementation with, in terms of recruitment, a discrete sector beginning to emerge.

Simon says the industry has certainly got a lot busier with the demand on the ITS resource higher than ever and this has made it easier to attract candidates to the profession. 'ITS isn't just a concept any more – you can attract people from other industry sectors by pointing out the tangible examples of where ITS is around us and how it will affect us in the future.'

But how open is the industry to outsiders? Simon says that most clients ideally are looking for people with a highways background but, are becoming more and more open minded about recruiting from other professions. He adds that candidates from outside the ITS sector can offer value for money and a different perspective on how to do things. In his experience it is not difficult to get people that have never heard of ITS, excited about it. 'Ninety-five per cent of the candidates I speak to who have never heard of ITS when I call them, are very interested once it's spelt out to them what it means. The offer of an industry that has a long-term financial commitment from the government means that people can join the industry and plan their future career in line with anticipated growth.'

Simon has noticed a real pull on the UK ITS skills pool from the Middle East over the last three years. 'Candidates have been lured by the scale of the projects and the financial benefits of working out there which means there are fewer qualified people in the UK. But it works both ways – this is a very international sector.'

undergraduate programme in ITS and the idea is to offer a European-wide masters programme involving Vienna and a subset of partners with funding coming from the EC's Erasmus Mundus Masters Programme. The format envisages full-time students who can travel between Universities – possibly a limited market – but it will also be a stimulus for the development of distance learning material.

Distance learning is perhaps one solution to the funding problems – certainly this is the route taken in the US where the CITE (Consortium for ITS Training and Education) programme was set up in the late 1990s. Over the years the consortium has grown to include some 105 universities and associations, mainly from the US but also from overseas – Southampton for instance is a member. CITE has developed over 30 interactive web-based courses geared to both graduate students and professionals.

This concept was taken up by the Politecnico di Torino under the leadership of Professor Bruno dalla Chiara. Over the past two years more than 40 hours of ITS lessons have been prepared based on text, videos and simulations, vocally commented with a text-to-speech read by the computer, potentially in any main language. At the present time the material is mostly in Italian but the intention is to make all the learning mate-

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**Christer Karlsson, ITS Sweden**

rial available in English. Bruno dalla Chiara says the challenge is to bring together engineering cultures, such as electrical, mechanical, civil, computer science, etc, which traditionally have been more or less separate but which combine in ITS. ‘This means that, according to the different background or previous education of the students, the educational materials can be used at various levels in order to create a more transversal culture than that traditionally provided in engineering. ITS requires the flexibility to permit the user to enter into either a deep analysis of the subject, or sometimes just to have a general knowledge of the subject.’ It's an exciting project,

he says, because the material has to deal with ‘new applications’ which most people have no experience of yet.

The lessons sit on an eplatform, [www.its-elearning.net](http://www.its-elearning.net), reserved – for the time being – to the creating staff, besides students who follow the ITS subjects at the Master course in Torino. The website was developed by the DITIC (Transport engineering) department at the Politecnico with ‘moderate’ support from the Ministry of Transport in Italy and the collaboration of software developers. This material is now available in Italian but Bruno says the original concept was and is for a European-wide network of elearning material.

Some lessons, maybe those generally useful or desired by government, would be available free of charge. The main body of the material, which would be accessible to students anywhere in the world, would be subject to payment. The idea is that each participating institution could produce its own material, load it onto the server with income split according to the contribution made.

Whether full time Masters courses or distance learning, when it comes to the two basic problem of where to get essential funding to set up and run courses, and how to attract students to a profession that has such a complex identity, there's still a long way to go.



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