

PS PUBLIC SERVICE REVIEW

European Science & Technology 15

an independent review

Helga Nowotny

comments on collaboration with international partners

Astrid Krag

highlights opportunities for innovation in healthcare

Maria Damanaki

discusses marine developments and Blue Growth

Anne Glover

on bringing the scientific evidence base to policymaking



In international waters

How Europe can strengthen global research efforts



analysis•opinion•debate

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Curiouser and curiouser

Innovative and creative thinking must be nurtured in education to drive Europe forward, argue Lejf Moos et al, of the European Educational Research Association...

The European Union is focusing on economic development and on meeting the grand challenges of climate, energy and migration. Technological and social innovation are among the main tools for development. This is logical; if you want to improve your situation, it stands to reason to do things differently to how you had done them previously.

Innovation is one of the key factors in keeping standards of education high and rising, and thus it is a good idea to look at the conditions for quality education in order to learn about innovation. Further enhancing education is not only important if the EU is to fulfil its Europe 2020 goals, but also when looking at the conditions for innovation in research.

A child's first encounter with the institution of knowledge and human development comes at school. The Danish historian Palle Lauring tells the story of his first two school days during the 1930s in his memoirs; on the first day, the teacher told an insightful and engaging story about the hen, the chicken and the egg. Lauring was

totally taken by the story and was convinced that the teacher was very clever. His curiosity had been ignited and he looked forward to listening to the next part of the story. Unfortunately, he was disappointed on the second day to discover that the teacher had apparently forgotten everything, because she asked the pupils about the exact issues she had introduced to them on the first day.

Lauring experienced a dark and unfortunate feature of schooling: it is not only about acquiring new knowledge, feeding curiosity, and developing an enquiring mindset, it is also about monitoring and controlling students' performance, skills and knowledge. It is about making sure that the transfer of knowledge has taken place. Too often knowledge is treated as a commodity that can be transferred from one person to another. Research reveals that such a model of knowledge transfer hinders effective and innovative education: humans create knowledge both individually and together, and the challenge for educators is to help learners create their knowledge productively.



Curiosity is central to students' development, but is often stifled by a fixed knowledge-driven curriculum

In educational politics, we often see that the basics of learning and teaching have been forgotten, particularly where fostering pupils' curiosity is concerned – their urge to get to know the outside world, their relationships with other people, and their own place and position within these relationships and the world. This requires an understanding of education that acknowledges the most important thing – the desire to learn – and that this learning must serve to satisfy children's curiosity and help them put their knowledge into perspective.

Curiosity is the most pivotal grounding and source of developing pupils' competences and, in the long run, of societal development. Teachers and schools can further curiosity by feeding into the processes, by pointing out new targets to focus on and learn about, and by giving food for reflection and investigation. This calls for experimentation, by testing new knowledge and perspectives on already known understandings, and, very importantly, by motivating and pushing students into new and creative investigations of 'how things are' and 'how things could be', enquiring into all the 'what ifs' and 'as ifs'. Let them find their own place in the midst of all these processes and features, and let them find themselves.

It is important for students and teachers to get a sense of what students have acquired and learned in order to find out where to go next and how to get there. Therefore, subject and learning specific evaluation is needed to provide feedback to the learning community. Unfortunately, education is often endangered by accountability systems and technologies that prescribe how student learning has to be monitored and measured, such as testing the reproduction of specific, prescribed pieces of knowledge. Teachers tend to teach for tests and students adapt and learn with reference to a knowledge base that is already defined. This kind of knowledge is easily measured – because it is something that the system and the teachers already know well.

Unfortunately, this becomes the core of schooling in a system that asks for accountability within a means-end

logic. If the system builds on a detailed, fixed knowledge-driven curriculum, it will not support creativity and innovation. If this course is followed further, we will, without doubt, see student curiosity dwindling, experiments being prescribed within 'educational programmes' and, in turn, innovation drying out – falling within well-known horizons and thus being of no use for the learner or society.

This may be one of the big paradoxes of our time: building educational systems that we are familiar with, where teachers know everything that students need to acquire, while knowing, all too well, that such a model makes it difficult for students to learn as they will only acquire old knowledge and not be able to develop new and critical insights.

These reflections caused us to write in the theme for the European Conference on Educational Research (ECER) 2013 that: '...educational actors have the power to unlock the creative, innovative and critical potential of the young, while also overseeing what happens when a basic capability for being curious, experimental and creative is directed to serve economic purposes in an innovative society.'

Improvements in creativity and innovation in society are urgently needed. This cannot be done, however, without fostering the development of innovative and creative education and educational research.

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