

Bodies of Knowledge

How the learning sciences could transform practical and vocational education

Overview

***Bodies of Knowledge* explores the ways in which the sciences of learning can contribute to raising the esteem of practical and vocational education (PVE). This is the first time researchers have fully considered the implications of cognitive science and neuroscience for PVE.**

The science of 'embodied cognition' is an emerging area of research, but it builds on ideas developed and implemented over a great many years. As far back as 1907, Maria Montessori realised that young children learn through experiment and experience, and not solely by listening and reading.

The authors begin by challenging the assumption that mind and body are somehow separate, and that 'mind' is superior to 'body'. They draw on research in the fields of cognitive science and neuroscience to demonstrate that the mind and body work together to develop knowledge, understanding and skill. This is as true for the professor who walks and gestures while thinking and talking, as for the hairdresser who uses touch to decide how to cut and style a head of hair.

The report uses research evidence to challenge a number of myths associated with practical learning: for example, that it is 'easier' than academic styles of learning. It turns out that far from being inferior,

practical and vocational learning can be at least as complex, demanding and satisfying as academic learning.

Drawing from a broad range of research, the authors offer a description of the habits and frames of mind used by successful learners, regardless of whether they are learning in an academic or a vocational context.

The authors argue that we draw on these habits and frames of mind, in varying degrees, whenever we learn *about* something, or *how to do* something. There is essentially no difference in the habits of mind, or the frames of mind, of someone who is learning about literature, and someone who is learning how to repair a refrigerator. Both of them investigate, experiment, reason and imagine. Along the way, they show curiosity, determination, resourcefulness, and so on.

The authors suggest that if we use the same language to describe all forms of learning, we will narrow the distinction between academic and practical learning.

Finally, the authors draw out the implications of the habits and frames of mind for people who teach practical and vocational subjects, and suggest how further research might improve the transfer of learning from the classroom to the workplace and vice versa. The report's key messages are summarised overleaf.

About the research

Edge asked the Centre for Real-World Learning (CRL) to review research into practical and vocational education (PVE) and consider:

- definitions of PVE and its counterpart, Practical and Vocational Learning
- how, why and where PVE and PVL happen
- evidence of PVE's effectiveness and impact, both short and long term, for learners, society and the economy.

The research was conducted by Professors Guy Claxton and Bill Lucas, supported by Rob Webster. In *Bodies of Knowledge*, their starting point was a review of evidence drawn from the learning sciences, neuroscience and cognitive science. Adopting a constructivist approach to

teaching and learning, they offer a research-based model of practical learning. Finally, they explore the wider cultures and contexts of PVE.

Bodies of Knowledge is one of two reports CRL have produced for Edge. The other, *Mind the Gap*, reviews existing research and literature on PVE and PVL in the four nations of the United Kingdom, supported by a limited comparative review of evidence from elsewhere in the world. Drawing on key findings from research reports, interviews with leading experts and other sources of information, the authors have mapped the available evidence and identified opportunities for further research. Both reports are available from www.edge.co.uk/research

Key messages

The new learning sciences

This report explores the ways in which the sciences of learning can contribute to raising the esteem of practical and vocational education (PVE). The science is developing apace, but its implications for PVE have not previously been explored in detail.

The authors begin by demonstrating some of the ways in which the science of embodied cognition supports a better understanding of the ways in which mind and body work together. They show that, far from being 'inferior', practical activity can be at least as complex, demanding and satisfying as 'academic' learning. New thinking associated with embodied cognition is used to challenge many of the myths associated with practical learning.

A working model of real-world learning

Drawing from a broad range of research from a predominantly constructivist perspective, the report offers a model for practical and vocational learning (PVL, or 'real-world learning'). The model offers a combination of habits and frames of mind characteristic of successful learners in a wide range of spheres.

The report also stresses the importance of the context of learning both from the perspective of the learner in the moment of engagement (termed 'presence of mind') and in relation to the cultures and contexts in which learners find themselves.

The *habits of mind* are:

- Investigating
- Experimenting
- Reasoning and
- Imagining.

The *frames of mind* are:

- Curiosity
- Determination
- Resourcefulness
- Sociability
- Reflection, and
- Wisdom.

These habits and frames of mind suggest a number of fruitful questions which PVE practitioners may wish to consider. Most essentially, the evidence suggests that each of these qualities of mind can be either suppressed or developed by the context of learning, and raises the possibility that PVE could – and, the authors argue, should – aim to strengthen these, as well as developing vocationally specific knowledge, skills and attitudes.

The model is novel and, in places, speculative. Nevertheless it serves to demonstrate that practical learning is no less intelligent than, and every bit as worthy of admiration as, the academic learning to which it is too often unfairly contrasted. For each of the model's elements, the authors suggest practical lines of enquiry which those interested in PVE might fruitfully pursue.

Learning contexts

PVL rarely takes place entirely in isolation. In almost every aspect of PVE there will be 'communities of practice' from which the learner can draw strength. It is increasingly clear which aspects of organisational cultures are hospitable and which can be unhelpful to the development of learners.

The authors suggest that until recently, insufficient attention has been paid to the social context of the workplaces in which vocational learning is nurtured. They suggest about how research might improve the transfer of learning from classroom or workshop to workplace and home.

An exciting future

The new thinking reviewed in *Bodies of Knowledge*, together with the proposed model of real-world learning, offer exciting opportunities for a reappraisal of the way PVE is perceived, conceived and delivered in the UK and elsewhere. People who teach practical and vocational topics have very largely concentrated on their domain-specific curriculum. This report presents a parallel world of PVL processes.

The authors suggest that they are two sides of the same coin. The habits and frames of mind described here engender confidence, pride and creativity as well as enhanced competence. Most importantly of all, they apply to all forms of learning: there is essentially *no difference* between 'academic' and 'vocational' learning.