Vocational Pedagogy: what it is and why it matters

Technical Report · January 2015

DOI: 10.13140/RG.2.1.2375.6563

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Vocational Pedagogy: What it is and why it matters

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Executive summary

One of the original aims of A Curriculum for Excellence was to place more emphasis on employability and skills required to meet market demand.

The final report of the Commission for Developing Scotland's Young Workforce has made a series of recommendations in the same vein. In Sir Ian Wood's own words, "There should be a continuum from primary school right through into employment".

Developing a young workforce demands a culture change from all parts of the education and training system. In particular, there needs to be a focus on high-quality vocational teaching and learning, wherever and whenever it takes place.

This paper challenges some popular myths – for example, that "clever people don't get their hands dirty" – before proposing six desirable outcomes from vocational learning. Having set out the aims, Professor Lucas goes on to outline the major features of successful vocational pedagogy, or **the science, art and craft of teaching and learning vocational education.**

The author, Bill Lucas, is Director of the Centre for Real-World Learning at the University of Winchester.

Key lessons for Scotland

- vocational education is demonstrably a complex, intelligent activity which engages mind and body together. It is a myth that it involves only lower-order thinking, and that it is only for the less 'able'
- vocational education can (and should) support six outcomes:
  - **routine expertise** (being skilful)
  - **resourcefulness** (stopping to think and deal with the non-routine)
  - **functional literacies** (communication, and the functional skills of literacy, numeracy, and ICT)
  - **craftsmanship** (vocational sensibility; aspiration to do a good job; pride in a job well done)
  - **business-like attitudes** (commercial or entrepreneurial – financial or social - sense)
  - **wider skills** (for employability and lifelong learning)
- vocational pedagogy involves a range of techniques and approaches, which vary according to the subject being taught (eg. brick-laying or cutting hair) and the context in which teaching takes place (eg. a school, college or workplace)
- most vocational learning methods are experiential – that is, they involve learning by doing. However, they also call upon reflection, feedback and theory, leading to an ability to apply something learned in one context to another, perhaps novel context
- from the moment a vocational teacher walks into a room, he or she is faced with a range of choices. There is now good evidence to help them make the kinds of choices which will improve the quality of teaching and learning and so be more likely to create excellent workers. The dimensions of these choices are explored and explained in the final section of the paper.

1 The challenge

The real issues facing any truly engaging educational system

The final report of the Commission for Developing Scotland's Young Workforce, Education Working for All, has identified many of the issues facing Scotland as it seeks to create a world class workforce and proposed some ways of addressing them.

This paper offers an approach to vocational pedagogy which might be helpful as Scotland builds on its broad Curriculum for Excellence to create educational opportunities which will engage all of its young people.

Scotland is not alone. Countries across the world are looking at the ways in which they can best engage all students at school or college and considering how to develop the kinds of skills needed for success in the workplace and personal effectiveness as a citizen. Strategies for improving the capabilities of young people typically include new curricula, better engagement of employers, the creation of new kinds of schools, campaigns to reward or re-esteem vocational pathways and boosting apprenticeships.

While there is a place for each of these approaches, they frequently miss some vital elements. In particular, it is essential to appreciate that vocational teaching and learning is not simple: in fact, it is highly complex. Second, we must define some desirable outcomes from practical and vocational education. And, third, we must set out clear guidance about how to teach and learn vocational education more effectively – which we describe as vocational pedagogy.

"Scotland is not alone. Countries across the world are looking at the ways in which they can best engage all students."

2 Practical and vocational learning

The complexity of practical and vocational learning

Vocational learning is under-researched and under-theorised. It is also the victim of naive assumptions about what it means to be intelligent.

In Bodies of Knowledge (Claxton et al., 2010) we set out to discredit eight 'myths' about practical and vocational education:

Myth 1: practical learning is cognitively simple

Myth 2: clever people 'grow out' of practical learning

Myth 3: you have to understand something before you can (learn how) to do it

Myth 4: clever people don't get their hands dirty

Myth 5: clever people don't 'need' to work with their hands

Myth 6: practical education is only for the less 'able'

Myth 7: practical learning involves only lower order thinking

Myth 8: practical teaching is a second-rate activity

None of these myths is true, but they are widely believed. Their continued existence reminds us that although vocational education is demonstrably a complex, intelligent activity which engages mind and body together, not everyone acknowledges this fact.

Six desirable outcomes

If we are to reconfigure our education systems to ensure that they truly work for all students, we need to present vocational pathways as broader and more valuable rather than defining it by 'not being academic'.

The goal of vocational education is, we believe, enabling people to do things in the workplace; it is not enough to be able to write or talk about such things (as might be the case in more general education).

Unpacking this simple goal, we propose six outcomes:

1. **routine expertise** (being skilful)
2. **resourcefulness** (stopping to think and deal with the non-routine)
3. **functional literacies** (communication, and the functional skills of literacy, numeracy, and ICT)
4. **craftsmanship** (vocational sensibility; aspiration to do a good job; pride in a job well done)
5. **business-like attitudes** (commercial or entrepreneurial – financial or social – sense)
6. **wider skills** (for employability and lifelong learning).

Routine expertise

Routine expertise involves skilled routines and the ability to carry out skilful activities to a satisfactory standard. It relates to the use of materials, tools and abstract concepts. Acquiring any kind of practical expertise requires time and practice. Anders Ericsson has suggested that typically it takes 10,000 hours to become an expert (Ericsson et al., 1993).

A default position for developing routine expertise would be that a teacher needs to get attention, explain, demonstrate, set an engaging task, give learners the chance to practise and provide multiple opportunities for feedback, questioning and reflection. Routine expertise tends to be developed, for example, by watching, by imitating, through careful and regular practising, via feedback from experts and peers and by being coached.

Resourcefulness

Sometimes we need to stop and think. We encounter something which is not routine and need to be able to respond accordingly.

Beyond the familiar and routines, expert practitioners are able to bring to mind knowledge that is applicable to new and unfamiliar contexts. In the vocational context, the prime function of 'knowledge' – theory, formulae, maxims, rules of thumb, heuristics – is to enable appropriate thinking, decision-making, and performance, in non-routine situations.

The relationship between knowledge and expertise is, of course, complex. Questions arise such as:

- **how much explicit knowledge** does a learner need in order to be able to perform a task?
- **how much of the necessary knowledge** will they acquire 'on the job'?
- **what is the role of theory**, frameworks, and models, in learning?
- **how and when should theory** be best introduced so that it comes to mind when needed?

Learners need to be able to apply knowledge in a range of situations which do not closely replicate those already encountered in training. Resourcefulness tends to be learned through extensive practice in a range of contexts. It can be promoted by problem-solving, through enquiry-based learning, by being coached in the moment, using virtual environments and through simulation and role play.

2 Practical and vocational learning (continued)

Craftsmanship

The literature of vocational education has – until quite recently – said remarkably little about craftsmanship: the pleasure, pride and patience involved in doing a 'good job'. In the last decade, however, there has been a number of attempts to understand the cultural aspects of being a skilled 'craftsman'. Mike Rose's **The Mind at Work (2005)**, Richard Sennett's **The Craftsman (2008)** and Matthew Crawford's **The Case for Working with Your Hands** (2010) are good examples.

Crawford sums up his idea of craftsmanship in these terms:

"As you learn, your trade... takes its place in a larger picture that is emerging, a picture of what it means to be a good plumber or a good mechanic... Your sense that your judgments are becoming truer... is a feeling of joining a world that is independent of yourself, with the help of another who is further along."

(Crawford, 2010: 207)

Craftsmanship is learned primarily through prolonged exposure to working cultures where excellence is constantly sought and where critical reflection is a way of being. It can also be developed and enhanced through watching, imitating, conversation and teaching and helping others. Competing can play a role when tied to an ethic of high levels of performance – something seen, for example, in WorldSkills competitions.

In a school and college context, Ron Berger (Berger, 2003) has explicitly explored ways in which different pedagogical approaches tend to cultivate an 'ethic of excellence'. Berger also highlights three ways in which an ethic of craftsmanship can be promoted:

1. using positive peer pressure to develop a positive culture built around a pride in 'beautiful student work' and by pairing more advanced students with those just embarking on their learning
2. by recognising that self-esteem grows from 'accomplishments not compliments' and can be cultivated through 'powerful projects' which fully engage students and also encourage them to make mutual critique
3. encouraging all teachers to see their profession as a 'calling' and to constantly seek to develop both their 'craft' and their 'scholarship'.

Functional literacies

There are justified concerns about the functional skills of literacy, numeracy and ICT in all parts of the UK. Functional literacies are slightly broader categories and include the general communication and comprehension skills which are as essential in vocational education as they are in general education.

There are live debates today about how best to teach these kinds of functional literacies. Some argue for them being embedded in authentic contexts and therefore likely to be taught by vocational teachers. Others suggest that they are better learned from specialists.

In terms of specific methods, it is likely that, if they have not been adequately acquired by the age of 16, some kind of one-to-one intervention may be necessary. Regular corrective feedback is essential. Some learners thrive within well-structured and engaging virtual environments, perhaps using incentives of the kind found in many computer games. Others need simpler practice and repetition coupled with feedback and reflection.

Business-like attitudes

Work may or may not be 'for profit'. Many services, for example in social services and housing, are provided by the 'third sector'. Nevertheless, an essential outcome from all vocational education is being able to understand and to practise the 'basics' of running or working in an organisation providing services or products with budget. This broadens out to include specific tasks such as marketing, book-keeping, invoicing, and estimating. It also includes 'softer' skills, such as communicating with customers and peers in a professional, polite, and effective way.

As with craftsman-like outcomes, learning to be business-like is hugely influenced by the culture in which the learning takes place and, specifically, by the behaviours modelled of staff and other learners. Watching, imitating, conversation, listening, and teaching and helping others are examples of some useful specific methods.

Wider skills

As the end of the 20th century approached, one of the most pressing questions related to the sorts of competencies the 21st century would demand.

In a report for the National Endowment for Science, Technology and the Arts, my colleagues and I identified a wide range of approaches to wider skills adopted across the world by national and state education departments, research institutions, third sector organisations, and commercial organisations, (Lucas and Claxton, 2009). The sorts of 'wider skills' deemed important are many and varied, and are described variously as 'broader skills', 'competencies', 'dispositions', 'capabilities', and 'habits of mind'. Employers regularly call for employees with wider skills such as problem-solving, team-working, resilience, entrepreneurialism etc. in addition to high-level basic skills.

Methods which require learners to take responsibility for their own learning are likely to work well here, such as practising, receiving (and giving) feedback, teaching and helping others, real-world problem-solving, enquiry, learning on the fly, being coached and various kinds of simulation and role play.

3 Vocational pedagogy

Vocational pedagogy encompasses the science, art and craft of teaching and learning vocational education.

More simply, vocational pedagogy is the sum total of the many decisions which vocational teachers take as they teach, adjusting their approaches to meet the needs of learners and to match the context in which they find themselves.

In 2012 my colleagues and I were commissioned by City & Guilds to undertake research into this topic and articulate a theory of vocational pedagogy (Lucas et al., 2012). What follows is a brief rehearsal of points made in that report.

Being clear about the nature of vocational pedagogy matters: it forces us to think about the wider goals of vocational education and thus to improve its status and scope. It also helps us to understand that vocational education is worthy of serious study.

Once grasped more comprehensively, vocational pedagogy enables us to develop models and tools which can help teachers more effectively match teaching and learning methods to the needs of their students and the contexts in which they are working. A plausible description or theoretical underpinning cannot be developed for vocational pedagogy unless we are prepared to ask and answer some fundamental questions about vocational education. Figure 1 indicates our line of thinking.

We considered the goal and desired outcomes of vocational education earlier, and need not repeat ourselves here. However, we need to pause over the word 'subject'. Learning how to build a load-bearing wall is different from cutting a head of hair or creating a website or caring for someone with dementia. Helping people learn how to do these widely different things calls for widely different approaches to vocational pedagogy.

Similarly, effective vocational teachers draw on a long list of teaching and learning methods, choosing those which are likely to work best in any given situation. They adapt to the needs of learners and the context in which the learning is taking place.

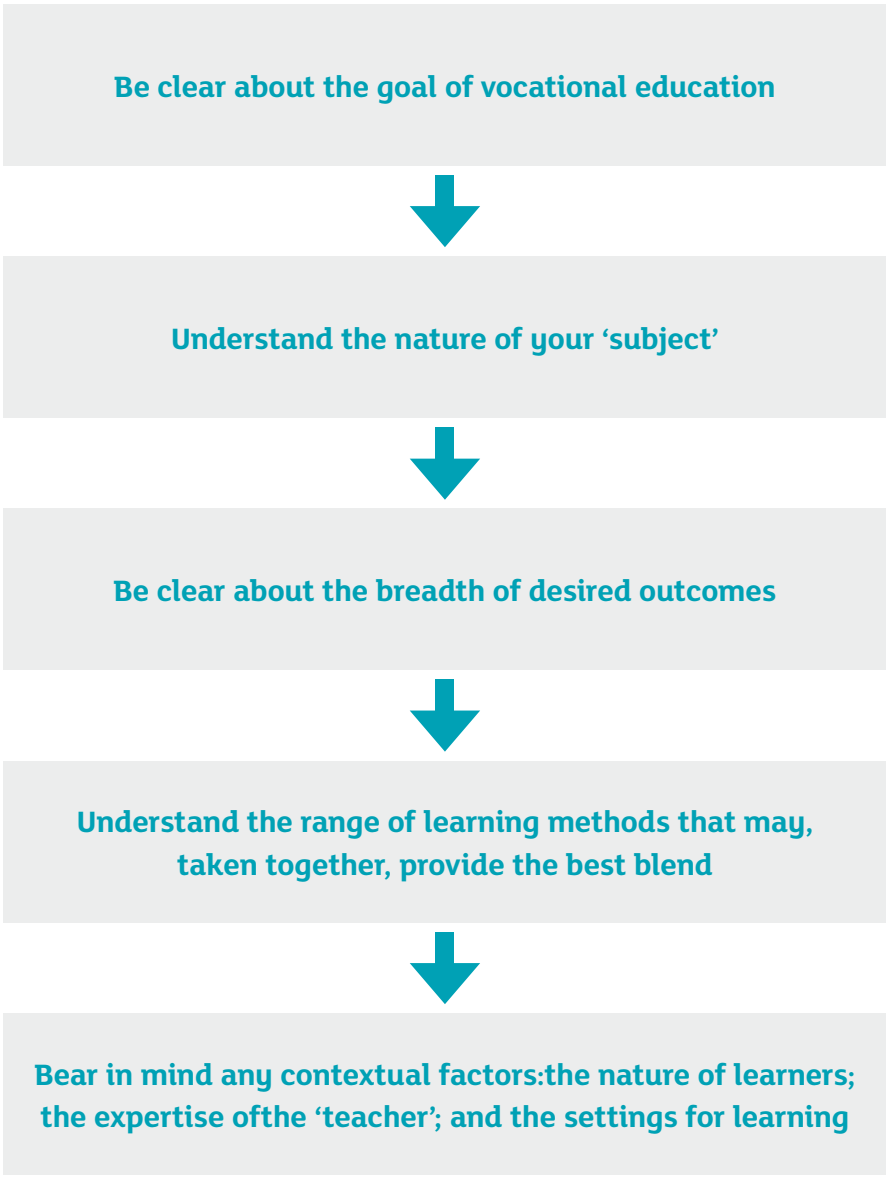

Figure 1 – Five key steps in developing vocational pedagogy

3 Vocational pedagogy (continued)

The idea of 'signature pedagogy'

First coined by Lee Shulman in 2005, **'signature pedagogy' refers to 'the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions'.**

'Signature pedagogies prefigure the culture of professional work and provide the early socialisation into the practices and values of a field. Whether in a lecture hall or a lab, in a design studio or a clinical setting, the way we teach will shape how professionals behave…' (Shulman, 2005).

One way of thinking about signature pedagogies is to consider the medium through which the work is expressed, for example, working with:

1. physical materials – for example, bricklaying, plumbing, hairdressing, professional make-up
2. people – for example, financial advice, nursing, hospitality, retail, and care industries
3. symbols (words, numbers and images) – for example, accountancy, journalism, software development, graphic design.

In thinking about pedagogical choices it may therefore be helpful to start by considering the degree to which a particular subject suggests certain learning methods or has a signature pedagogy. If we grouped vocational subjects widely taught in colleges it might look like Figure 2.

While these groupings are, inevitably, somewhat arbitrary, vocational teachers tell us that they are helpful starting points in encouraging them to think afresh about teaching and learning methods. Most subjects will have aspects of each of our three different focus 'materials' as part of their endeavours.

Recently, in work commissioned by the Royal Academy of Engineering, I have sought to reframe the lack of STEM skills issue faced by both Scotland and England as being the result of schools failing to use the kinds of signature pedagogies likely to cultivate engineers (Lucas et al., 2014).

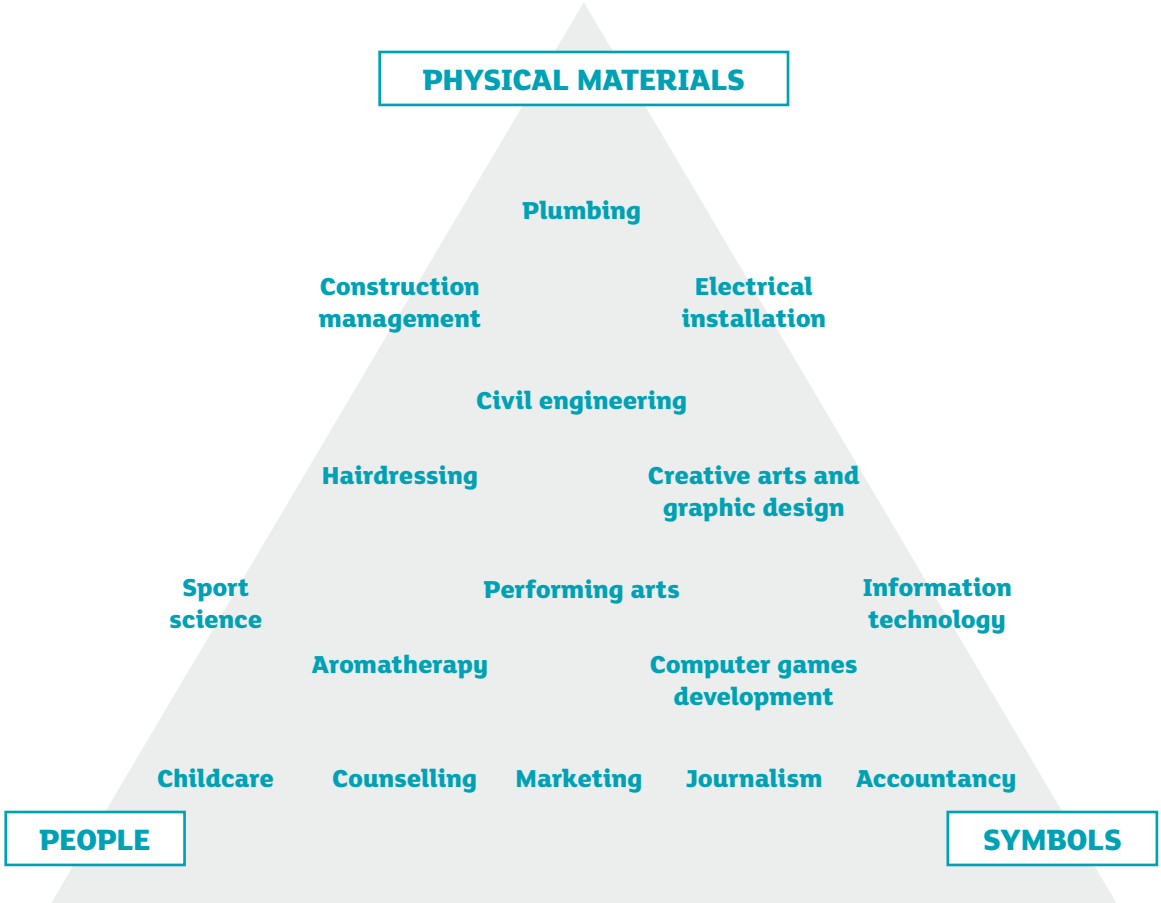

Figure 2 – A selection of subjects taught in FE grouped according to their predominant media

3 Vocational pedagogy (continued)

Teaching and learning methods

Too often vocational teachers rely on a narrow range of methods. But the research shows there are many different engaging methods from which to choose. Whether or not learners achieve the six desired outcomes described earlier will largely depend on the degree to which the most appropriate blend of methods has been selected.

The list in Figure 3 is indicative of those vocational learning methods which have considerable value and which are relatively well-understood in a range of contexts. For each one there is significant research to suggest that it might be effective in vocational education. The majority are broadly 'learning by doing' or 'experiential', though many combine reflection, feedback and theory.

"But the research shows that are many different engaging methods from which to choose."

- learning by watching
- learning by imitating
- learning by practising or trial and error
- learning through feedback
- learning through conversation
- learning by teaching and helping
- learning by real-world problem-solving
- learning through enquiry
- learning by listening, transcribing and remembering
- learning by drafting and sketching
- learning on the fly
- learning by being coached
- learning by competing
- learning through virtual environments
- learning through simulation and role play
- learning through games.

Figure 3 – Vocational learning methods which work

3 Vocational pedagogy (continued)

Responding to context: blending pedagogical methods

The final set of considerations in creating a vocational pedagogy requires us to focus on the important issue of context.

Context matters in all kinds of learning. Learning something while working beside a supervisor in a factory is different from learning to make a dovetail joint in a college workshop or learning about health and safety legislation via an online course. Each of these situations is different. First, the other learners who may or may not be present will affect things. Then the 'teacher' and his or her experiences, traditions and culture will shape it. And thirdly, of course, the physical location will play an important role.

Context is specifically important in vocational education as most teaching and learning takes place in the dual settings of both workplace and educational institution. A skill may be taught in one setting with a view to being largely applied in another, often in a move from college to workplace. This brings with it two further challenges:

- **ensuring that what is learned** theoretically in one context is applied effectively in another, and
- **anticipating how best learners** can be taught so that they can prompt themselves to use skills learned in one context when they need them for real in another.

Just as vocational education teachers are drawn from dual professional worlds, so vocational teaching settings span the worlds of work and of education. Yet whether located in a college classroom or a busy salon, the physical aspects of any 'designed learning environment' are hugely influential in terms of the choices 'teachers' can take with regard to pedagogy. In a workshop setting, for example, it is easy to enable vocational learners to move between expert instruction, collaborative investigation and practising a skill using specialist equipment. On a busy production line or in a small classroom, on the other hand, this blend of methods is much more difficult to achieve.

The organisation of space and its impact on learners is generally under-researched. But to understand 'settings', it seems helpful to think of at least two levels of meaning:

- the physical space, and
- the culture of learning.

Vocational pedagogy is, in effect, a series of choices to be taken by teachers with regard to learning and teaching methods. These choices directly impact on the quality of learning outcomes and, ultimately, on the quality of a country's workforce.

In thinking about designing a vocational pedagogy it is important to see a number of different levels at play. It must work both at the day-to-day level (eg in lessons) as well as at the macro end as determined by the various sector skills bodies (eg in the context of occupational standards) and at all points in between – series of lessons, modules, courses and whole qualifications.

To help vocational course designers and teachers we suggest a series of ten spectrums or dimensions, each of which needs to be considered in context (Figure 4). It is important to point out that these are not binary, either-or spectrums: teachers and designers will most likely settle on points part-way between the two extremes of each dimension.

So, for example, when teachers are considering their role, they will want to be thinking about which situations call for a more didactic approach and which will tend to be more effective if more facilitative. Neither end of the spectrum is right or better than the other. They are judgments that require teachers to make an assessment of content, desired outcome, chosen method, characteristic of learner and context. Nevertheless there has been a shift in thinking about pedagogic practice which is moving broadly to the left of our figure.

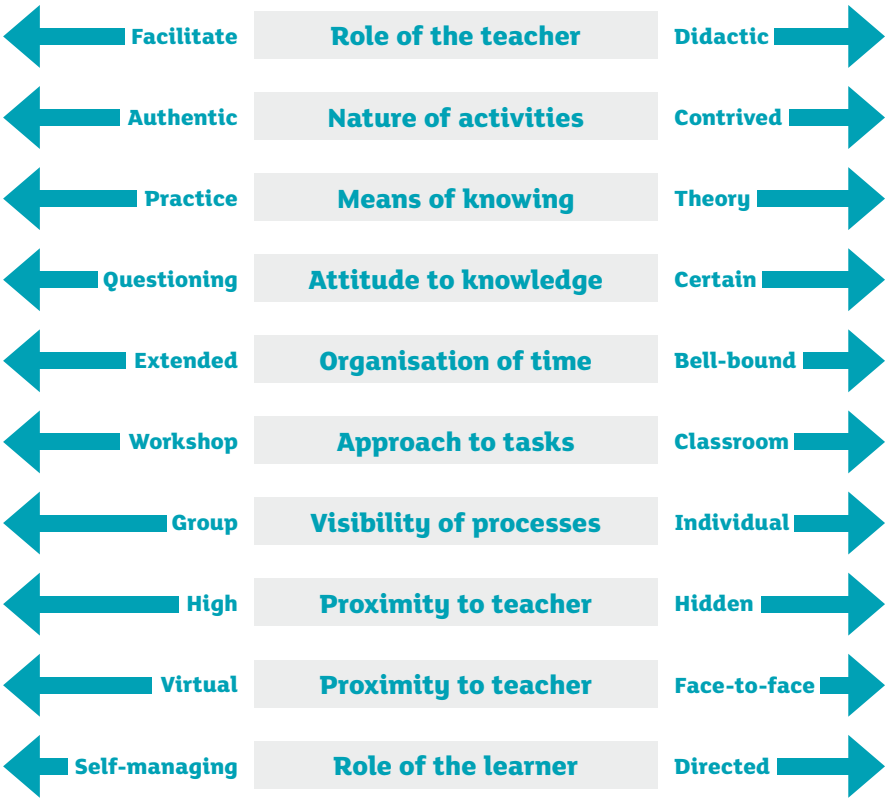

Figure 4 - Ten Dimensions of Decision-Making in Vocational Pedagogy

4 Final word

From the moment a vocational teacher walks into a room, he or she is faced with a range of choices. It is our belief that there is now good evidence to help them make the kinds of choices which will improve the quality of teaching and learning and so be more likely to create excellent workers and that this is a key element of what is required in improving the quality of vocational education.
We also suggest that being explicit about the kinds of choices you are making is important. Naturally, as teachers become more skilled they will need to think less consciously about what they do. By the same token, trainee teachers will need to make more conscious decisions.

As Scotland embarks on its ambitious and commendable plan to ensure that education works for **all** of its young people, I hope that a more nuanced exploration of the power of vocational pedagogy might be part of its strategy.

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Author's note

This paper draws substantially on work commissioned by City & Guilds and published as:

How to teach vocational education: a theory of vocational pedagogy
Lucas, B., Spencer, E., and Claxton, G (2012) London: City & Guilds.
Figures 1, 2, 3 and 4 are taken from this paper.

The leadership implications have subsequently been explored in:
Pedagogic Leadership: Creating cultures and practices for outstanding vocational learning
Lucas, B. and Claxton, G. (2013) London: 157 Group.

The thinking was also the topic of an e-Forum organized by UNESCO in June 2014. The initial spark for our thinking was a major commission from the Edge Foundation in 2008.