Skills Needed for Innovation: A Review

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There has been little explicit empirical research or theoretical writing on how skills contribute to innovation.

Section one: Deals with the meaning of skill and the types that have been identified. This discussion highlights the need for a more robust and versatile definition and a better categorisation of the types of skill.

Section two: Examines the definition and types of innovation, the review indicating that there is also a need for further work in this area.

Section three: Focuses on the skills needed for innovation. Here too, the literature offers little information on the skills needed, suggesting further research is required.

Section four: Outlines the implications of these observations for VET, arguing that additional investment in VET would enable it to improve skill levels, including the ability to innovate.
The Meaning of Skill
Labour process theorists define skill in terms of three dimensions:

- Skill that resides in the worker
- Skill demanded by the job
- Socially constructed skill

Skill is a contested term and difficult to define, with no agreed robust definition. However, skill develops over time with practice, involves cognitive processes and appropriate manipulation and application of knowledge, normally involves education and training, and includes an element of autonomy or discretion that allows performance with economy of effort in a workplace and societal context (Hurrell, Scholarios & Thompson 2013, pp. 165, 166, 176).

This highlights the need for an integrated approach to defining skill that includes complexity and autonomy/discretion in a workplace and societal context.
Types of Skill

- Technical skill
- Soft skills
- Generic skills
- Competencies
INNOVATION
The Organisation for Economic Co-operation and Development (OECD), in the third edition of the *Oslo Manual*, defines an innovation as ‘the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations’ (OECD 2005, p. 46). The Manual defines four types of innovations:

- Product innovations
- Process innovations
- Organisational innovations
- Marketing innovations

This definition has been described as a large ‘fit all’ definition.
It has been argued that the ‘fuzziness’ in the definition of innovation, is due to the following:

- It is defined and measured either as a product or as an activity (Godin 2002 p. 25).
- Survey respondents find it difficult to determine whether an innovation is new to the firm, the market or the world (OECD 2005, p. 57).
- The Manual defines innovative firms as those that develop new products and those that adopt new processes. Godin (2002, p. 26) claims that these are two phenomena and probably cannot be integrated into a single measure.
- It is not clear whether the definition is based on the collection of data on the innovative activities of the firm, or the collection of data about specific innovations (OECD 2005, pp. 20–21).
Organisational slack: the time and space to experiment and achieve innovation.

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SKILLS NEEDED FOR INNOVATION
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- Workforce skills are a necessary but not a sufficient condition for successful innovation
- Work organisation methods
- While the skills needed for innovation are broad-based, there is also a need for a mix of skills.
- Skills identified as important for innovation include:
  - Management and leadership skills
  - Technical and scientific skills
  - Interpersonal skills
  - Consumer feedback skills (consumption skills)
IMPLICATIONS FOR VET
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- Well placed to teach the trades and related skills
- Role in developing soft skills
- Partnerships between VET providers and universities including offering university bachelor degrees
- Partnerships between VET providers and professional bodies
- Provision of short courses
- Main institution for diffusing/transferring knowledge and skills
- Seen as important in contributing to knowledge creation
- Criticism of VET
  - More formal recognition should be given to the VET system in innovation councils, industry skills councils, and in innovation policy
  - In summary, VET has a key role in building skill levels in the workforce, including skills associated with innovation: it therefore needs additional investment to achieve this
CONCLUSION
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- Lack of an explicit focus on skills in the innovation studies literature.
- Because there are many types of innovation and the complexity of their sources and processes for creation, the relationship between skills and innovation will always be complicated.
- The skills involved depend on the nature of the innovation (e.g., incremental etc.), the nature, availability and distribution of skills within an enterprise, and the ability to develop new skills within organisations and across the economy (Green, Jones & Miles 2007, p. 10).
- Skills for collaborating and networking as well as skills (and mechanisms) for ‘building connections across organizational, professional, and disciplinary boundaries’ are becoming increasingly important (Dodgson & Gann 2010, p. 134).