Competence Theory and Research

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Agenda

- Competence theory
- Definitions – dimensions
- Scope
- Types of competencies
- Competence frameworks
- Competence-based education
- Competence management
- Competence assessment
- Measurement issues
- Competence research
- Conclusions
Competence theory
Theories which are relevant for vocational education 2021

Communities of practice
Argumentation-based learning
Cooperative learning
Boundary crossing
Cognitive apprenticeship
Blended learning
Experiential learning
Cognitive load
Brain development
Flexibility
Identity development
HRD
Transfer
Concept-context
Activity-based learning
Expansion learning
Professional development
Learning organization
Competence
Self-regulation
Cooperative learning
Cooperative learning
Authentic learning
Team learning
Qualification
Brain development
Situated cognition
Inquiry-based learning
Test
Social learning
Explicit Direct Instruction
Performance
Evaluations
Emotion
Project-based learning
Motivation
Performance
Personal epistemology
Workplace learning
Problems-based learning
Educational effectiveness
Agency
Team learning
Social learning
Design thinking
Theoretical developments

- **Psychological theory**
  - motivation (White/Deci&Ryan); expertise (De Groot (chess experiments); the big five personality traits (Barrick & Mount) -> the great eight (Bartram)

- **Performance theory – technology-improvement**
  - McClelland; Gilbert; Appelbaum; Chomsky; Dubois

- **Management theory – organization strategy; business administration; leadership**
  - Peter; Prahalad & Hamel; Boyatzis

- **Educational theory - how to improve quality of education**
  - Craig; Biggs & Tang; Miller; Mulder; Ten Cate; Van der Vleuten

- **Sociological theory**
  - Habermas; Billett; Nussbaum
Theories of competence

- Performance theory – the AMO-model (Appelbaum et al.)
- Self-determination theory (Deci & Ryan) – the CAR-model
- Alignment theory (Mulder)
- Domains of occupational competence (Billett)
- Shaping competence theory (Rauner)
- Instructional theory (De Corte et al) – the CLIA-model
- Capability theory (Cairns and Malloch)
- Human development and capabilities theory (Nussbaum)
- Plus: Entrustable Professional Activities (Ten Cate)
- Plus: Competence Assessment (Miller)

Theoretical contributions of the competence concept

- Explains variation in performance (AMO-model)
- Triggers motivation (CAR-theory)
- Points at improvement potential (worthy performance)
- Articulates domains of teaching (based on job profiles)
- Holds course of learning (core competence)
- Provides communication language (about learning and development priorities)
- Defines expectations frameworks (for professions, educational programs, careers)
- Includes application of knowledge in practice
- Stresses the importance of the attitude dimension in education
Definitions – dimensions
My preferences of dimensions

1. centrality
2. contextuality
3. definability
4. developability
5. dynamic nature
6. knowledge-inclusion
7. measurability
8. mastery level
9. performativity
10. transferability
My understanding of competence

1. integrated capabilities
2. consisting of knowledge, skills, and attitude clusters
3. needed in a certain profession, occupation, job, role, organisation, or task situation
4. which are conditional for sustainable effective performance, including
   ▶ problem solving
   ▶ realizing innovation
   ▶ creating transformation
Related concepts

- An accredited laboratory
- An approved medical officer
- A driving license
- A qualified teacher
- Reading ability
- Leadership capability
- Graduate attributes
Scope
Competence in context

- Competence in education
- Competence development in organizations
- Core competencies of organizations
- Competence in professions
- Competence or regions
- Competence and social history

Competence and society

- Discussions about world-wide implementation of the concept of professional competence and competence development, should be held against the background of:
- historical social-cultural developments
- work cultures and narratives in organizations and
- the factors in play regarding the informal economy
- creating livelihoods and
- small-scale entrepreneurship
Competence in VUCA worlds

- Variable
- Unique
- Creative
- Awesome
- Volatile
- Uncertain
- Complex
- Ambiguous
- Violent
- Unjust
- Corrupt
- Abusive
Types of competencies
Competencies for...

1.0 – specific activities

2.0 – known jobs

3.0 – the unknown future
Two sides of the competence coin

- **Capability to perform**
  - Proficiency, mastery, ability

- **Right to perform**
  - Legal authority, licensure, certification
  - Institutional, organizational, cultural or regulated power, approval or assignment to act, decide, (dis)approve or regulate
Competence frameworks
Institutional Use of Competence

- Rychen & Salganik, 2003 (OECD)
  - DeSoCo-project
- European Commission, 2005
- European Social Partners, 2006
- EQF - NQFs
- 2012 EU Assessment of Key Competences
- CEN (2014). European e-Competence framework 3.0
- 2015 Riga Conclusions - Key Competence as policy option
Global competency for an inclusive world - (OECD, 2016)

Competence in Medicine - Cornell Press, 2012
CanMeds Competency Framework, 2015

http://canmeds.royalcollege.ca/en/framework
PAS Civil Service Competency Models, 2017

Engineering competency model 2015

http://www.aaes.org/model
IMA Management Accounting Competency Framework

https://www.imanet.org/career-resources/management-accounting-competencies?ssopc=1
Bartram – The great eight Competency Framework (2005) – Explaining work success

- Leading and Deciding
- Supporting and Co-operating
- Interacting and Presenting
- Analysing and Interpreting
- Creating and Conceptualising
- Organising and Executing
- Adapting and Coping
- Enterprising and Performing

What are Graduate Attributes?

As part of the Washington Accord, every accredited engineering institution in Canada and every other signatory country must demonstrate that the graduates of their programs possess the attributes described under the following headings:

[Diagram showing the graduate attributes]

https://chem-eng.utoronto.ca/graduate-attributes/
NEA Leadership Competency Framework, 2020

https://www.nea.org/professional-excellence/leadership-development/leadership-competencies
## Elements of Competence Frameworks

Advocates for professional learning, professional quality and social diversity inside our professions and promotes our union's role in advancing education transformation, student learning, and equitable access to opportunities.

<table>
<thead>
<tr>
<th>Competency Theme</th>
<th>Level 1: Foundational</th>
<th>Level 2: Mobilizing and Power Building</th>
<th>Level 3: Agenda Driving</th>
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<tbody>
<tr>
<td>Supports professional excellence and builds capacity for continual improvement and learning to ensure the success of all students</td>
<td>Engages with others in meaningful development and models for continuous improvement and learning for all educators across their career continuum.</td>
<td>Builds and sustains an organizational culture of professionalism and reflective practice that illustrates the professional commitment to continuous improvement and learning for all educators across their professional continuums.</td>
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<tr>
<td>Recognizes and promotes the Association's role in improving the learning of all students</td>
<td>Learning Considerations: Understands strategies to lead others in best practices in professional learning and support, such as adult learning theory, models that are effective in professional learning, and ways to ensure that professional learning is embedded in and informed by practice. Learns how to use strategies to engage others in systematic high-quality professional learning opportunities and activities.</td>
<td>Learning Considerations: Utilizes system-level strategies (e.g., improvement science, labor-management collaboration) to create cultures of professionalism and reflective practice in support of student learning and growth.</td>
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<td>Program Learning Components:</td>
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<td>THEME:</td>
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<td>BEHAVIORS:</td>
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https://www.nea.org/professional-excellence/leadership-development/leadership-competencies
Competence-based education
Principles of CBE

1. The competencies that are foundations for the curriculum are defined.
2. Core problems are the organising unit for (re)designing the curriculum.
3. Competence-development of students is assessed formatively frequently.
4. Learning activities take place in several authentic situations.
5. In learning and assessment processes knowledge, skills and attitudes are integrated.
6. Self-responsibility and (self)reflection of students are stimulated.
7. Teachers both in schools and practice fulfil their roles as coach and expert in balance.
8. A foundation is realised for lifelong learning of students.

Wesselink et al, 2007
Wesselink et al, 2010
Sturing et al, 2011
Chapter 50
Competence Theory and Research: A Synthesis

Martin Mulder


Foundations of Competence-Based Vocational Education and Training

Martin Mulder

Competence-management
1. Develop competence-based personnel management
2. Define the core competency of the organisation
3. Arrange facilities for learning
4. Use of personal development plans
5. Develop competence profiles of job families
6. Develop competence profiles of job holders
7. Distinguish competence centres

Competence – related management instruments - 2

8. Using competence assessment in selection of new employees
9. Acknowledge informally acquired competence
10. Using competence assessment for employee evaluation
11. Market products/services with competence on the label
12. Assign coaches to employees for competence development
13. Appoint competence managers
14. Use of competence assessment in remuneration

Competence assessment
Levels of competence in professional development

5. Brilliance – great talent of superb performance
   ▶ Star

4. Excellence – delivering outstanding performance
   ▶ Expert/specialist

3. Competence – capacity of independent work
   ▶ Professional

2. Nascence – work under guidance
   ▶ Apprentice

1. Ignorance – work by instructions
   ▶ Novice
Popular levels in annual performance assessments

1. Needs attention
2. Sufficient
3. Good
4. Excellent
TIRER PARTI D'UN BILAN DE COMPETENCES

Vous souhaitez donner un nouvel élan à votre vie professionnelle ? Un bilan de compétences vous aidera à faire le point et à définir un projet. Voici quelques conseils pour profiter pleinement de ce dispositif.

Lydie Colders

http://www.generation-formation.fr/index_bilan.asp
Miller’s Pyramid of Competence

https://www.stemlynsblog.org/better-learning/educational-theories-you-must-know-st-emlyns/educational-theories-you-must-know-millers-pyramid-st-emlyns/
The wheel of competency assessment

Measurement issues
Data collection methods

- Competence self assessment
- Multi-rater assessments
- 360 degrees assessments
- Assessment by licensed assessor
- Assessment centers
- Observation of performance
- Think-aloud protocols
- Video-stimulated recall
- Case assignments and analysis of work
Validity threats of competence self-assessments

- Imposter syndrome
  - Professional uncertainty; Underestimating self-competence
  - Too good to know that own competence is of high level
  - ‘What I am doing is so easy that everyone can do it’
- Dunning-Kruger effect
  - Uneducated incompetence: Overestimating self-competence
  - Too much incompetence to know that one is incompetent
  - ‘What others are doing is so easy that I can also do it’
- Incompetence-compensation-competence
  - ‘I cannot do what is expected, but I can hide it very well’
50 Cognitive biases

- Fundamental attribution error
- Self-serving bias
- Halo-effect
- Defensive attribution
- Forer effect (Barnum effect) – vague statement prevail
- Confirmation bias
- Belief bias
- Status quo bias
- Zeigarnik effect (remembering incomplete tasks)
- Pessimism/optimism bias
- Blind spot bias
Competence research
Competence (PhD) studies

- Interdisciplinarity in higher education - Spelt et al (2009)
- Sustainable development - Wesselink and Wals (2011)
- Argumentation competence - Noroozi (2013)
- Multicultural cooperation - Popov et al (2013)
- Competence of beginning elementary school teachers - Alake-Tuenter (2014)
- Competence development in practical training – Khaled (2014)
Competence PhD studies

- Innovation Competence of Teaching Staff – George Kasule (2015)
- Export competence - Worku Birru (2016)
- Implementation and Effectiveness of CBVET - Getachew Habtamu (2016)
- Competence and Corporate Social Responsibility - Eghe Osagie (2016)
- Teacher-Student Interaction in Competence-Based VET - Misbah Zainun (2019)
- Competence development of Temporary Agency Workers - Nienke Woldman (2019)
- Sustainable development competencies - Yared Demssie (2021)
- Effects of CBT on Change in the Agriculture Sector - Chalachew Tarekegne (2022)
Reviews and critiques

- Grant et al, 1979
- Ellström, 1997
- Lum, 1999
- Rothwell and Lindholm, 1999
- Argüelles & Gonczi, 2000
- Westera, 2001
- Jones and Voorhees, 2002
- Hager, 2004
- Hyland, 2006
- Mulder, Weigel and Collins, 2007
- Smith, 2010
- Lum, 2011
- Winterton, 2011
- Mulder, 2014
- Powell & McGrath, 2018
- Mulder, 2019
Comprehensive Review of CbV&PE, 2017

- 50 chapters
- ≥ 85 authors
- from all continents
- Theories
- Policy developments
- CBE systems features
- Competence domains
- Synthesis

Conclusions

- Competence theory: a broad field, with conflicting contributions
- Different disciplinary foundations of competence theories
- Critiques are often based local experiences
- Competence research: has been booming
- Measurement needed at higher levels of validity/reliability
- Further synthesis of research needed
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