Professional Competence of Rural Development Advisors

MM Consultancy
for Education and Training

Society of Extension Professionals,

Extension Education Institute Campus, Rajendranagar, Hyderabad, Telangana, India

Webinar, May 20, 2022

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Chair Academic Board NCOI

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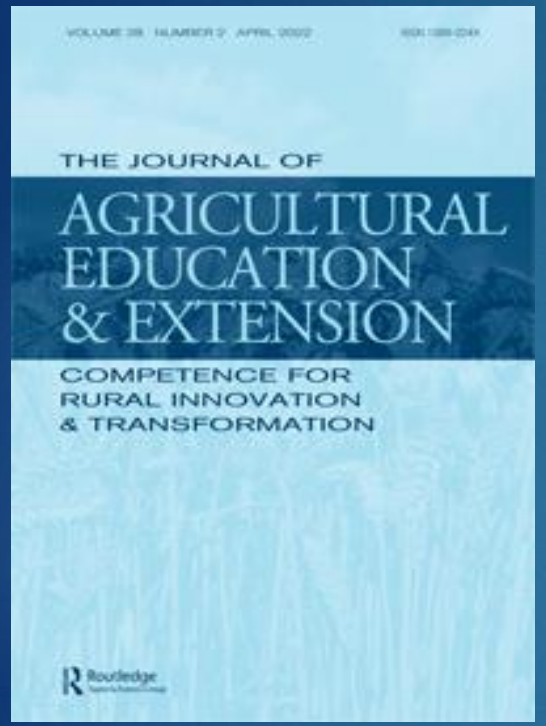
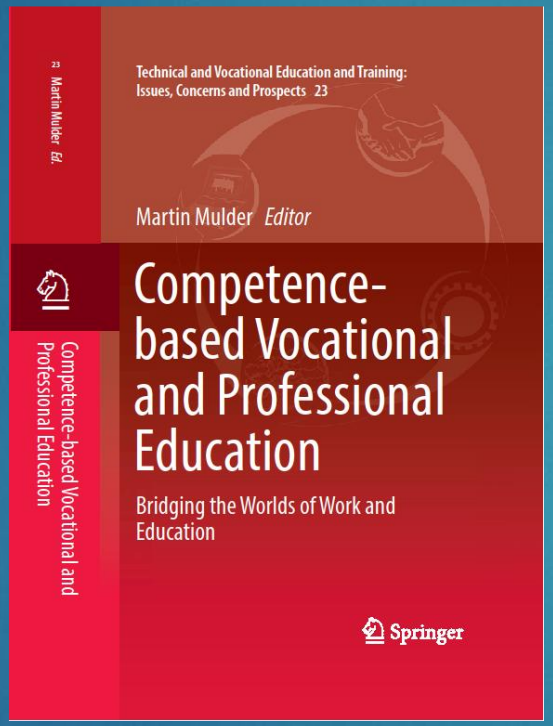
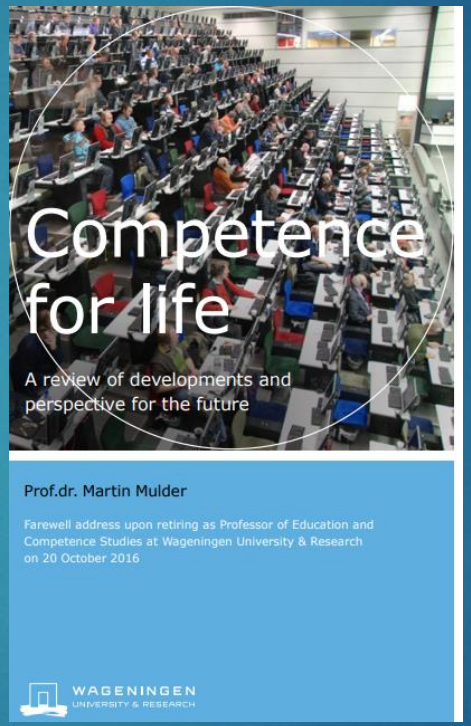
Past Chair of Education and Competence Studies, Wageningen University

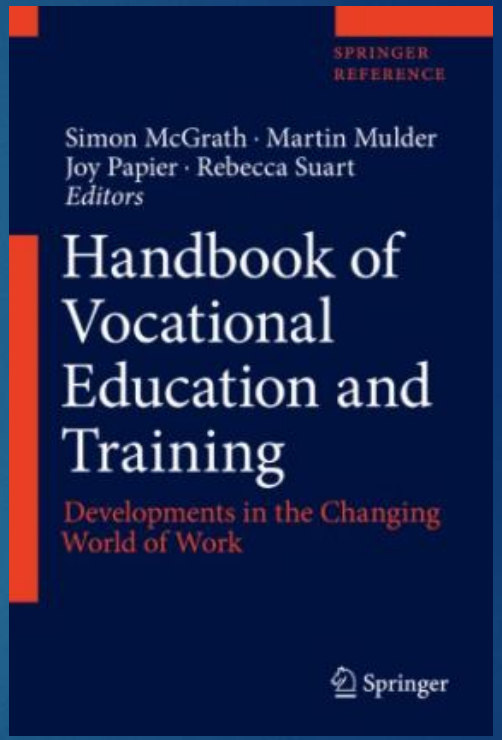
https://www.mmulder.nl/

Background









Mulder. M. (Ed.) (2017). *Competence-Based Vocational and Professional Education. Bridging the Worlds of Work and Education.* Cham, Switzerland: Springer

The Journal of Agricultural Education and Extension ›
Competence for Rural Innovation and Transformation
Volume 7, 2001 - Issue 4

Original Articles

Competence development - some background thoughts [1]

Martin Mulder

Pages 147-158 | Published online: 27 Feb 2008
Download citation
https://doi.org/10.1080/13892240108438822

Journal of Agricultural Education and Extension
Vol. 18, No. 4, 319–327, August 2012
Routledge Taylor & Francis Group

Competence-based Education and Training—About Frequently Asked Questions

MARTIN MULDER
Wageningen University, The Netherlands

Journal of Agricultural Education and Extension
Vol. 18, No. 3, 305–314, June 2012
Routledge Taylor & Francis Group

Competence-based Education and Training

Developing Comprehensive Competence-based Education and Training—Some Practical Guidelines

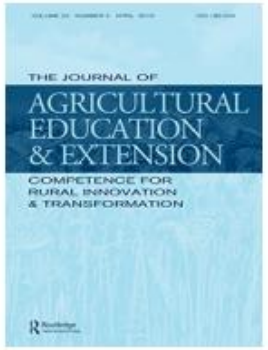
The Journal of Agricultural Education and Extension
Competence for Rural Innovation and Transformation
ISSN: 1389-224X (Print) 1750-8622 (Online) Journal homepage: http://www.tandfonline.com/loi/raee20

A Five-Component Future Competence (5CFC) Model

Martin Mulder

To cite this article: Martin Mulder (2017) A Five-Component Future Competence (5CFC) Model, The Journal of Agricultural Education and Extension, 23:2, 99-102, DOI: 10.1080/1389224X.2017.1296533

To link to this article: http://dx.doi.org/10.1080/1389224X.2017.1296533



The Journal of Agricultural Education and Extension
Competence for Rural Innovation and Transformation
ISSN: 1389-224X (Print) 1750-8622 (Online) Journal homepage: http://www.tandfonline.com/loi/raee20

Editorial – Extension education theory and research in India

Martin Mulder

To cite this article: Martin Mulder (2016) Editorial – Extension education theory and research in India, The Journal of Agricultural Education and Extension, 22:2, 105-109, DOI: 10.1080/1389224X.2016.1155890

To link to this article: http://dx.doi.org/10.1080/1389224X.2016.1155890

Publishing research in scholarly journals and assessment of research output

Professional Development Session

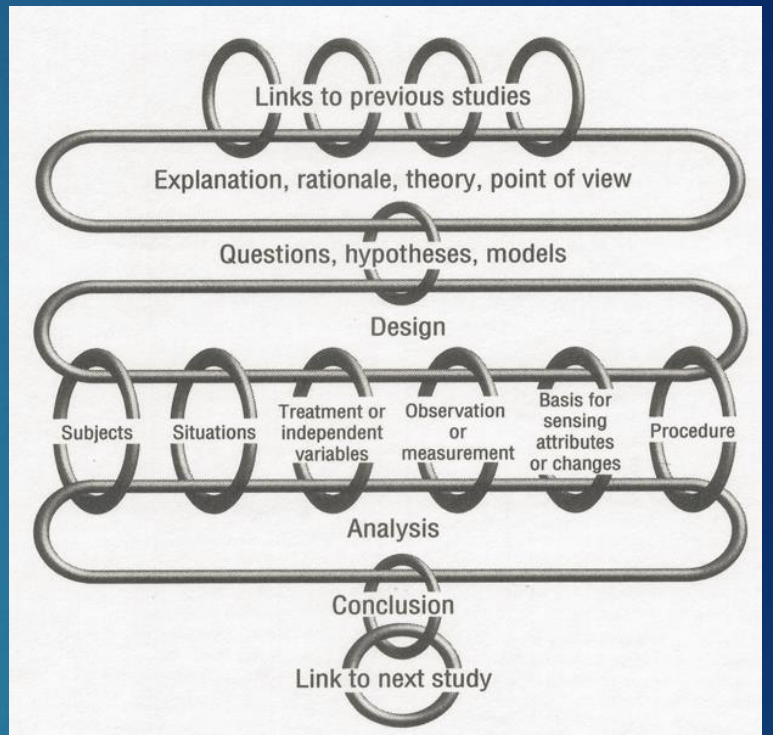
Martin Mulder, April 6, 2016, AIAEE, Portland, Oregon, USA
Wageningen University, chair group Education and Competence Studies
www.mmulder.nl

My key lessons learnt over 30 years of experience in academia

1. Select *journal first*, then start writing
2. *Follow-up* on an issue discussed in the target journal
3. Focus on *core message* for *specific audience*
4. Connect text fragments based on a *red thread*
5. Every article needs to have a punch line; a reason to read it; a *unique selling point*; one line with key conclusion
6. *Liaise* with editors and authors
7. Don't be overambitious; *climb up* the ladder

Getting published; pay attention to:

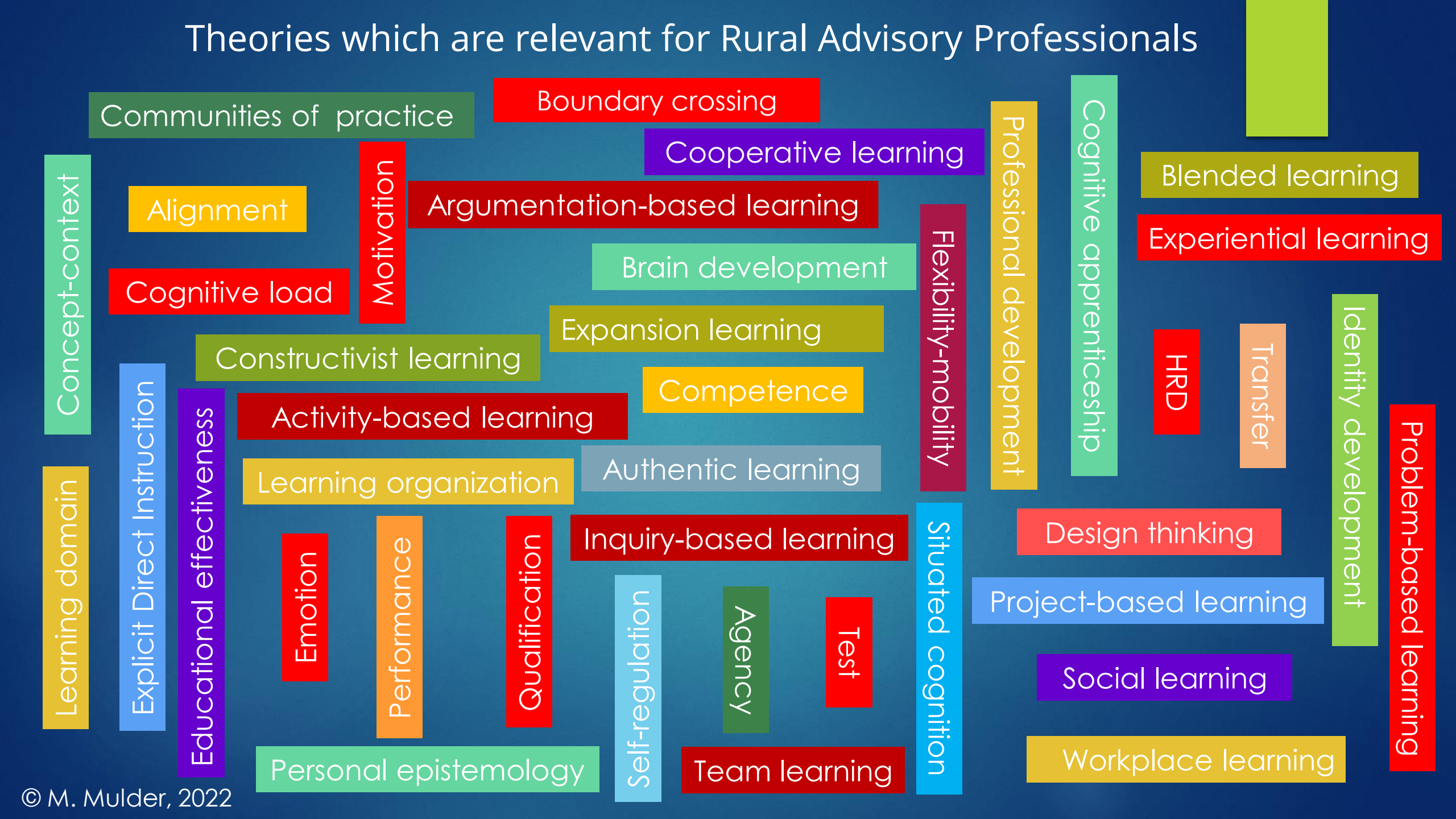
- The problem statement
- Review of current research
- Current conceptual framework
- Clear research methods
- Adequate data analysis techniques
- Main results first
- Conclusions following research questions
- Theoretical and practical lessons
- Correct and up-to-date reference List



Methods of Educational and Social Science Research: An Integrated Approach, by David R. Krathwohl. White Plains, NY: Longman Publishing Group, 1993, 789 pp.

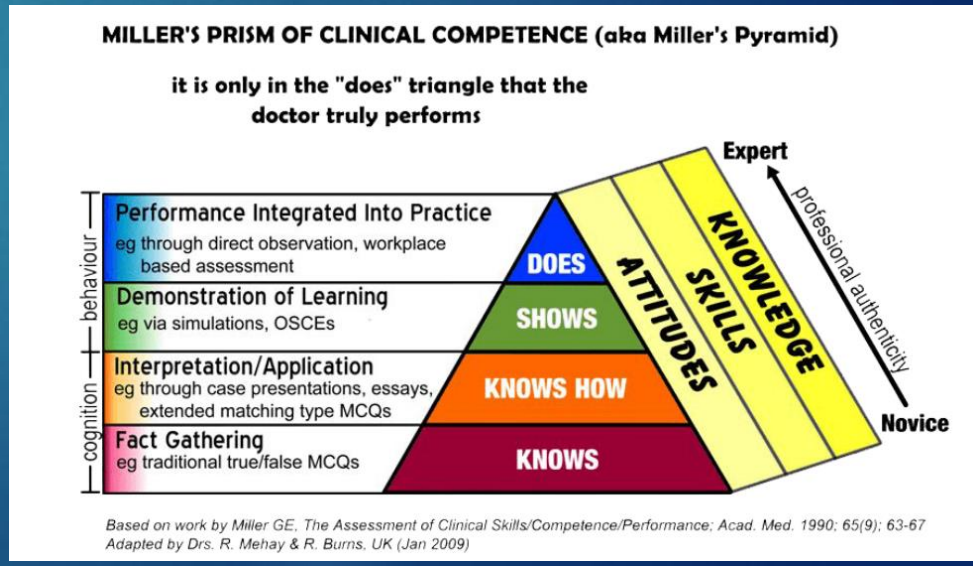
Martin Mulder (2018). Positioning VET research in international VET-discourses and publishing in academic journals. Contribution to Seminar at the Department of Vocational Teacher Education at OsloMet, Oslo, Norway. Accessible via: www.mmulder.nl

Theories which are relevant for Rural Advisory Professionals



My understanding of competence

1. Integrated capabilities
2. Clusters of knowledge, skills, and attitudes
3. Needed in a certain profession, occupation, job, role, organisation, or task situation
4. Conditional for sustainable effective performance
5. Include self regulation, critical thinking, problem solving, realizing innovation and creating transformation



Competencies for…

1.0 – Specific activities

2.0 – Known jobs

3.0 – Dynamic roles

4.0 - Industry 4 – IoT – homo robotics

5.0 The unknown future

Competence for life

Mulder, M. (2017). A Five-Component Future Competence (5CFC) Model. *The Journal of Agricultural Education and Extension, 23*(2), 99-102.

Competence in VUCA worlds

- Variable
- Unique
- Creative
- Awesome
- Volatile
- Uncertain
- Complex
- Ambiguous
- Violent
- Unjust
- Corrupt
- Abusive

Theories of competence

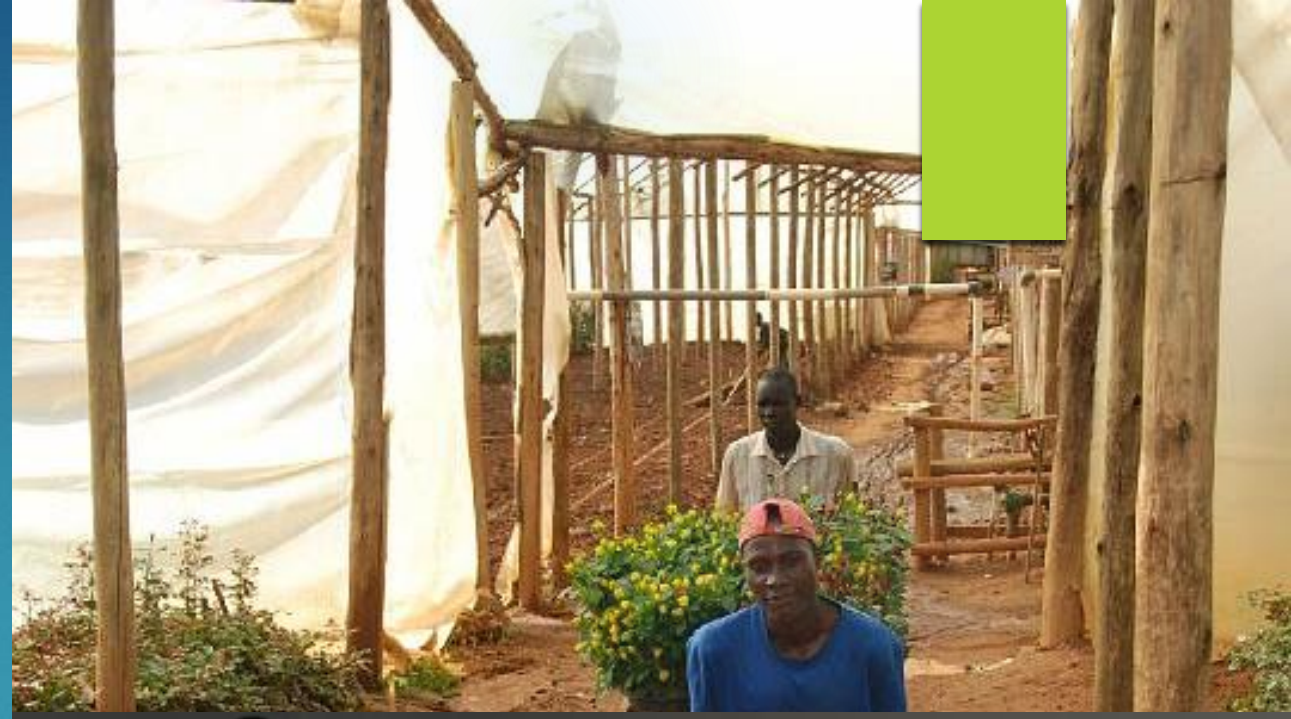
- Motivation theory (White)
- Worthy performance theory (Gilbert)
- Performance theory – the AMO-model (Appelbaum et al.)
- Core competence theory (Prahalad and Hamel)
- Self-determination theory (Deci & Ryan) – the CAR-model)
- Competence Assessment theory (Miller)
- Alignment theory (Mulder)
- Domains of occupational competence theory(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)
- Dynamic capability theory (Sadler-Smith)
- Entrustable Professional Activity theory (Ten Cate)

Extension of Mulder, M. (2019). Foundations of Competence-based Vocational Education and Training. In: McGrath, S., Mulder, M., Papier, J., & Suart, R. (Eds). *Handbook of Vocational Education and Training for the Changing World of Work.* Cham: Springer, pp. 1167-1192.

Three groups of competence theories

	Context	Pitfalls
1. Functional behaviourism	Training	Over-specification
2. Integrated occupationalism	Education	Performatism
3. Situated professionalism	Development	Over-generalisation

Global challenges and transformation of the agrifood complex



Global challenges, Knowledge Systems and Human Resources

Global challenges

- Climate change
- Land degradation
- Water supply
- Resource depletion
- Gene patenting
- Commodification
- Pollution
- Poverty
- Pandemics
- Energy costs
- Etc.

Agri-food Knowledge Systems

- Universities
- Research Institutes
- Agricultural Colleges
- Training Centers
- Extension organizations
- Private consultancies
- Manufacturers
- NGOs
- Etc.

Human Resources – Human Talent

- Unskilled laborers
- Service workers, shop, market sales workers
- Skilled agricultural and fishery workers
- Craft and related trades workers
- Plant and machine operators and assemblers
- Technicians and associate professionals
- Professionals
- Legislators, senior officials and managers
- Entrepreneurs
- Etc.

Holistic Competence Frameworks

Transformation of agriculture in NL

https://www.nationalgeographic.com/environment/article/netherlands-agriculture-food-technology-innovation

Westland – greenhouse horticulture

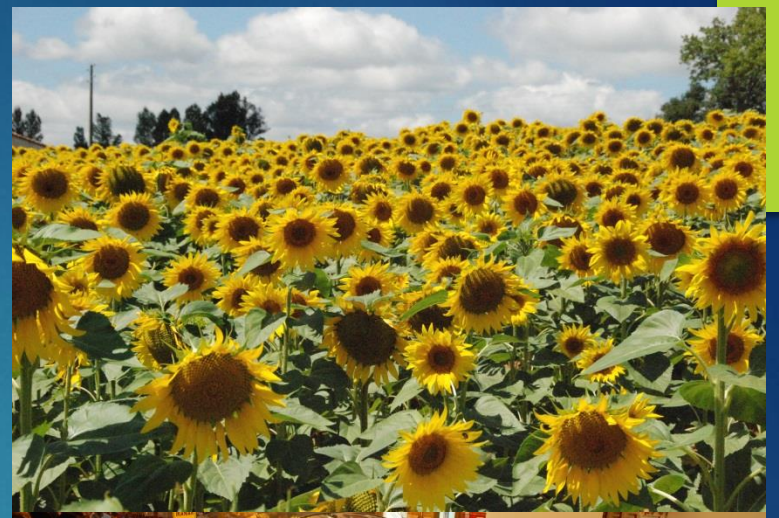
https://www.nationalgeographic.com/environment/article/netherlands-agriculture-food-technology-innovation

Multifunctional farming and use of space

- Crop farming
- Live stock farming
- Horticulture
- Dairy farming
- Regional products
- Leisure horse care
- Children nurseries
- Care farming
- Guest accommodations
- Gardening centers
- Caravan storage
- Art centres
- Country-side living

Interwoven complex of chains and networks

- Primary producers
- Input
- Trade
- Logistics
- Processing
- Manufacturing
- Sales
- Financing
- Insurance
- Governance
- NGOs
- Research
- Education and Extension



Nitrogen emission reduction policy

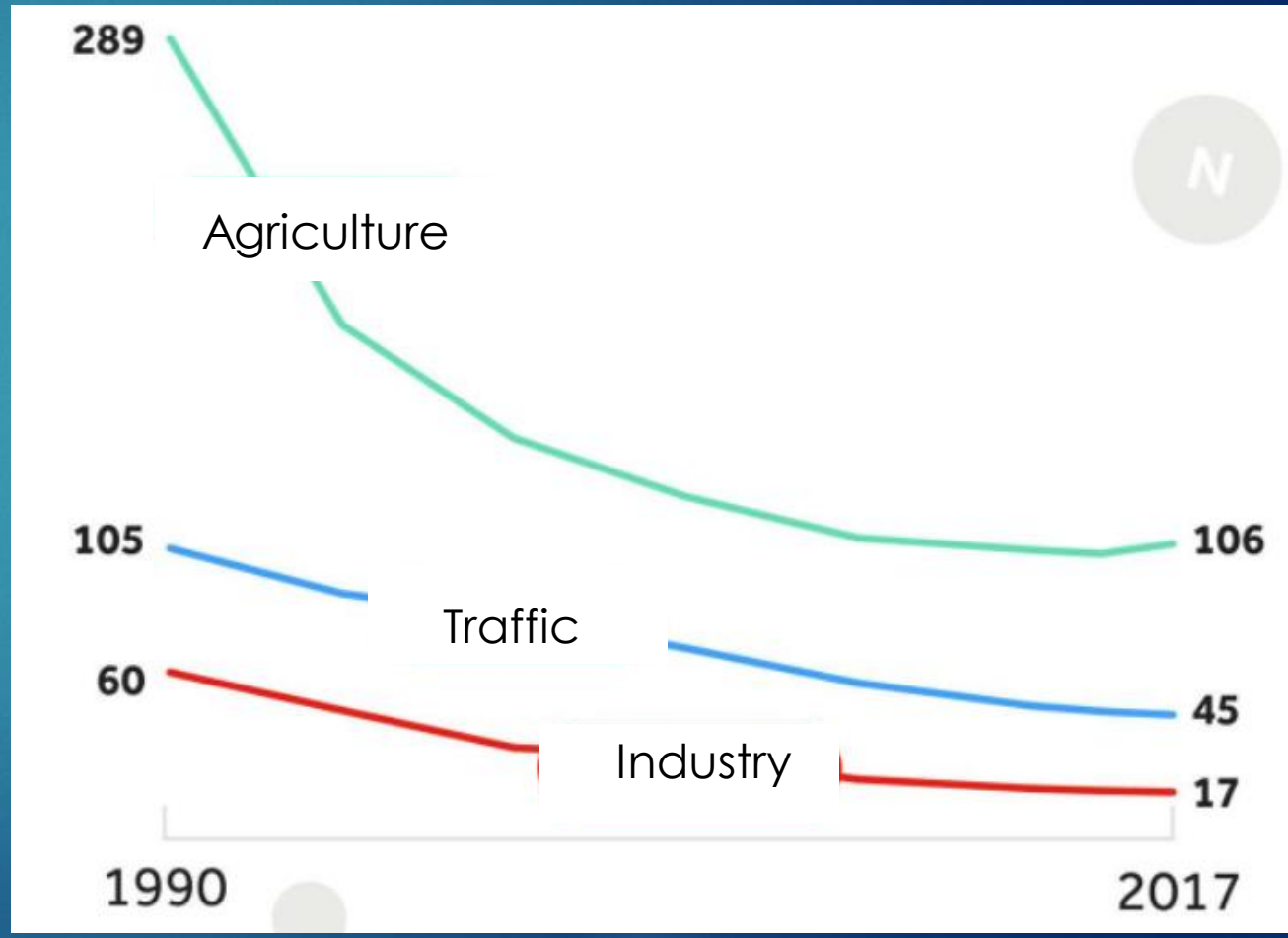
Buy-out scheme for farmers (dairy, pigs, poultry) (https://nos.nl/l/2428226)

Total numbers of animals in The Netherlands (2020)

- 92 million chicken
- 12 million pigs
- 4 million dairy herd
- 890,000 sheep
- 633,000 goats
- 450,000 horses

Source: Ontwikkeling veestapel op landbouwbedrijven, 1980-2020 | Compendium voor de Leefomgeving (clo.nl)

Total Nitrogen emission in million tons in NL



Source: RIVM

From state-run to market-driven

Was

- Ministry of Agriculture responsible for:

- Agricultural Research
- Agricultural Education
- Agricultural Extension

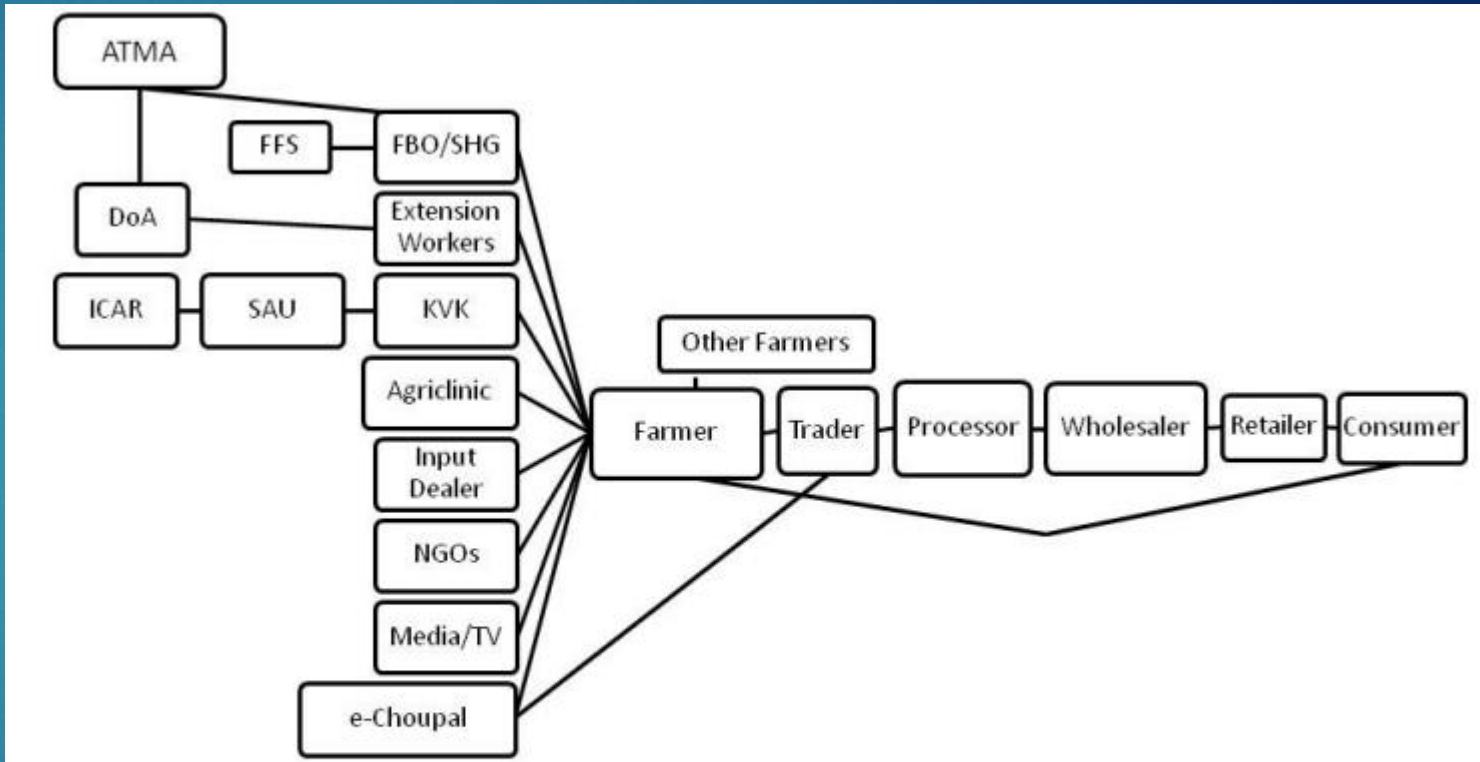
Is

- Ministry of Agriculture, Nature and Food Quality
- Agricultural, nature and food quality policy
- Ministry of Education, Culture and Science
- Agricultural Education
- Private Market
- Applied agricultural research
- Agricultural Extension

Emphasis on mitigating climate change, establishing a circular economy, carbon-neutral, sustainable, responsible farming and food production, lowering emissions, a less-polluted living environment, nature conservation and a healthy lifestyle

Extension in India, 2010

- 'Despite a wide range of reform initiatives in agricultural extension in India in the past decades, the coverage of, access to, and quality of information provided to marginalized and poor farmers is uneven.
- ''The review concludes that there is an increasing need to work in partnership and to share knowledge and skills in order to provide locally relevant services that meet the information needs of marginal and smallholder farmers in India.



Source: Authors.

Notes: Information flow is the line between the boxes, though strength and feedback in each line are not described here. ATMA = Agricultural Technology Management Agency, DoA = Department of Agriculture, ICAR = Indian Council for Agricultural Research, FFS = farmer field school, FBO/SHG = farmer-based organization / self-help group, SAU = state agricultural university, KVK = Krishi Vigyan Kendra (farm science center), NGO = nongovernmental organization.

Glendenning, C.J., Babu, S., & Asenso-Okyere, K. (2010). *Review of Agricultural Extension in India. Are Farmers' Information Needs Being Met?* Washington, D.C., Addis Ababa, New Delhi: IFPRI

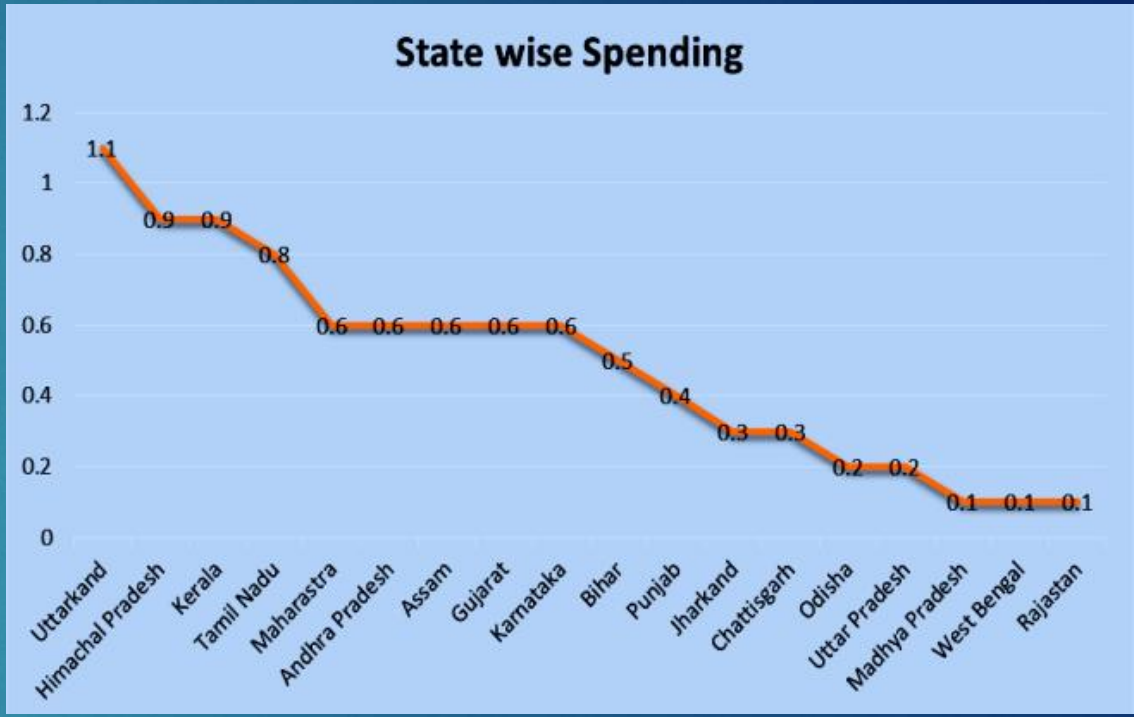
Extension in India - 2013

- The is a pluralistic extension sector, but it is not performing well.
- There are many challenges in the extension sector: understaffing, inflexible organization, incompetence of staff, a traditional dissemination approach, disconnection from research, limited access to farmers.
- Conflicting paradigms: on-farm assistance versus addressing whole value chain needs.
- Problems of demand of and access to information of farmers.
- Focus on productivity, profitability, and income generation.

Gupta, H., & Shinde, S. (2013). Agricultural Extension in India. *International Journal of Management and Social Sciences Research*, 2(11), 6-16.

State of extension in India - 2019

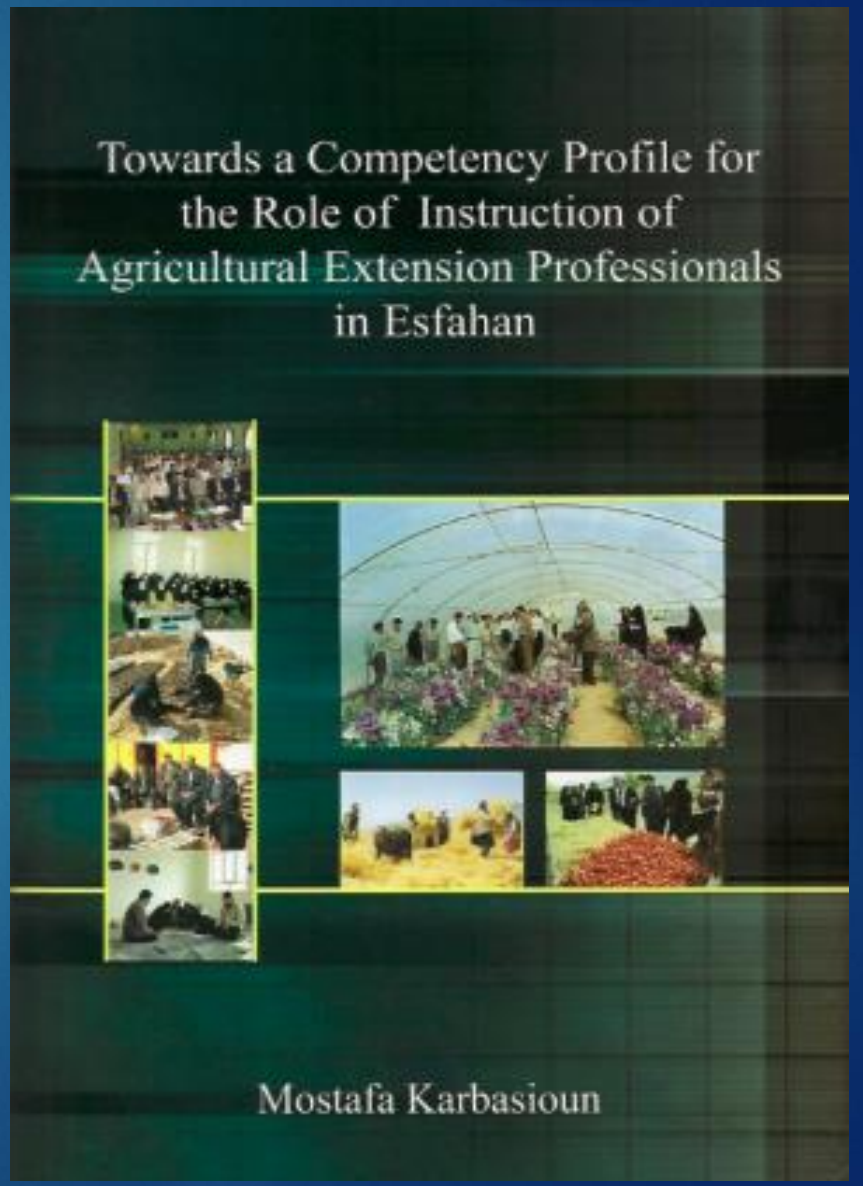
- Investment in agriculture research and education: around 0,7 per cent of GDP (Advice World Bank 2.0 percent); Variations by state
- Low political priority and support for the extension
- Number of extension workers too low
- Inadequate competence of extension functionaries
- Lack of farmers' participation in Extension planning and implementation



Nandi, R., & Swamikannu, N. (2019). Agriculture Extension System in India: A Meta-analysis. *Agricultural Science Research Journal*, *10*(3): 473-479

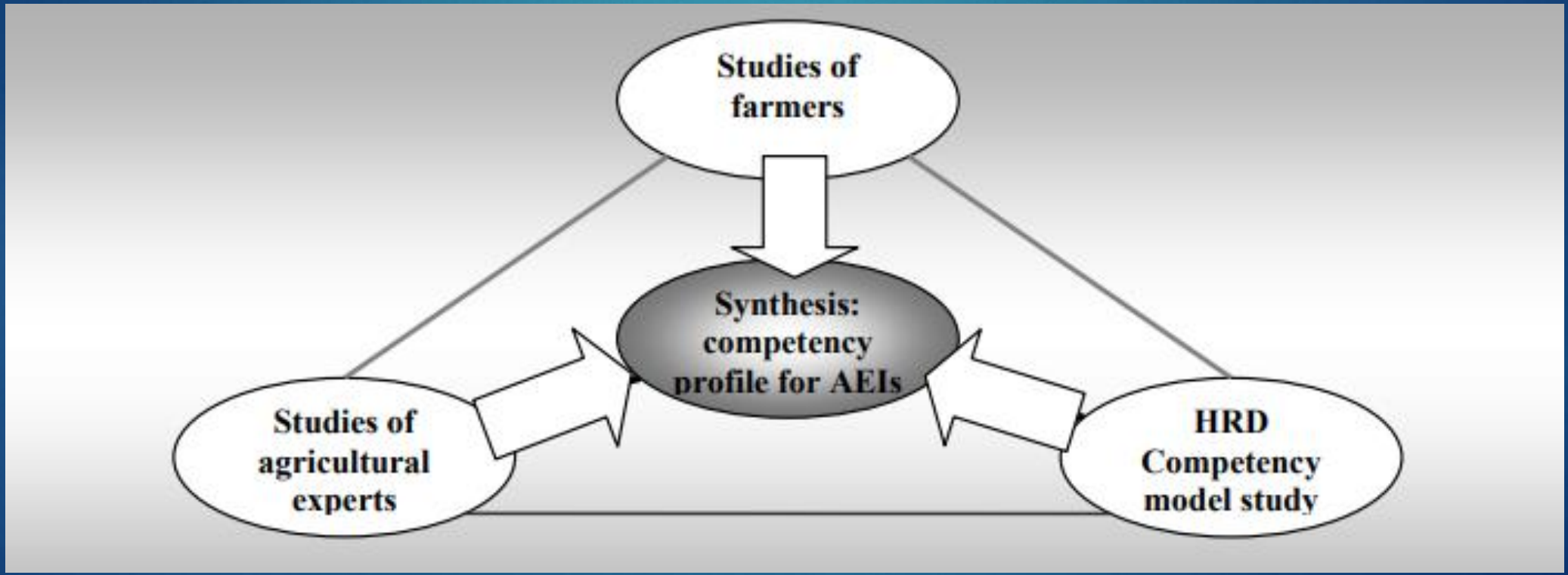
A competence profile for extension professionals (2007)

- Goal: to develop a competency profile for instructors in the agricultural extension service
- Methodology: competence model development HRD profession (P. McLagan, 1982)
- Key components: future forces, ethical issues, outputs, standards and competencies
- Main result: common competence profile for instructors is possible, but this should be differentiated by farmer population, gender, age, level of education, and motives for course participation.



Karbasioun, M. (2007). *Towards a Competency Profile for the Role of Instruction of Agricultural Extension Professionals in Esfahan.* Dissertation. Wageningen: Wageningen University.

Data sources used to synthesize the competence profile for extension professionals



Competencies for extension instructors

General competencies

- Intellectual versatility
- Relationship building skill
- Self-knowledge
- Communication skills
- Management skills
- Research skills
- Knowledge of governmental regulations and policies
- Knowledge and skills of new information technology

Course-related competencies

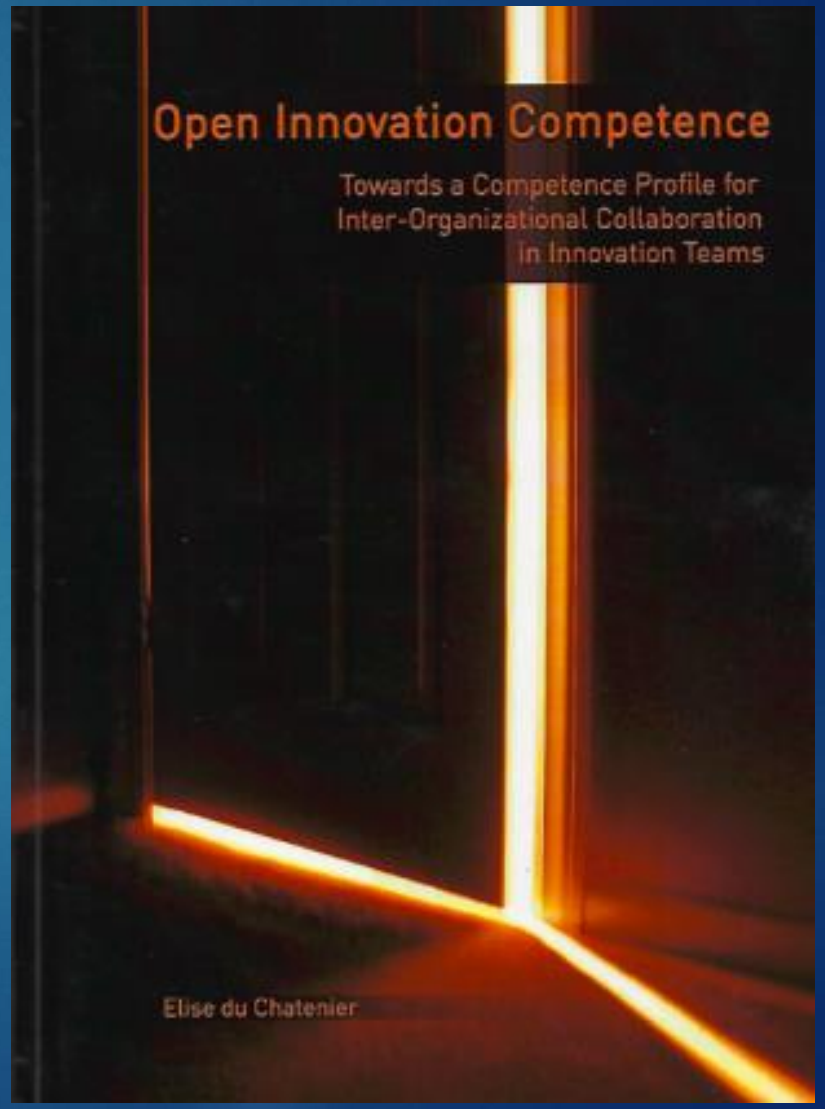
- Presentation skills
- Farmers' learning understanding
- Feedback skill
- Adult training and development
- Objectives preparation skills
- Performance observation skill
- Questioning skill
- Coaching skill
- Group process skill
- Program planning

Technical competencies

- Subject matter understanding
- Farmers' business understanding

Open Innovation Competence (2009)

- An open innovation team: a group of persons of different organizations who cooperate for the benefit of both parties, using each others' know-how
- Focus on individual competence in open innovation teams
- Results: 1. activities that need to be performed in open innovation teams, 2. competence elements needed to perform these activities, 3. an optimal clustering of the competencies and competence elements in a competence profile, 4. context variation of the resulting competence profile, and 5. the link between open innovation competence and team performance



Du Chatenier, E. (2009). *Open Innovation Competence. Towards a Competence Profile for Inter-Organizational Collaboration in Innovation Teams.* Dissertation. Wageningen: Wageningen University.

Competencies of open innovation

- Interpersonal management
  - Involve
  - Influence
  - Handle conflict
  - Create learning climate
- Project management
  - Take on
  - Prevail
  - Monitor
  - Decide mindfully
- Content management
  - Clearly communicate
  - Analyse
  - Explore
  - Combine
  - Compete

Fishing in India - Wikipedia

Thomas Lans – Farming – Entrepreneurship

- Focus: entrepreneurship competence
- Self-assessment of innovation competence by entrepreneurs; assessment by employees and external consultants; what are the learning activities that entrepreneurs perform?
- top competence strengths are: having a learning orientation and be good in self-management
- Many learning activities were found


The current issue and full text archive of this journal is available at
www.emeraldinsight.com/1366-5626.htm

JWL
19,1

32

Competence development of entrepreneurs in innovative horticulture

Martin Mulder, Thomas Lans, Jos Verstegen,
Harm Biemans and Ypie Meijer
Wageningen University, Wageningen, The Netherlands

Mulder, M., T. Lans, J. Verstegen, H.J.A. Biemans & Y. Meijer (2007). Competence development of entrepreneurs in innovative horticulture. *Journal of Workplace Learning, 19*(1), 32-44.

Competencies entrepreneurs possess

Competencies	Entrepreneurs 1	2	3	4	5	6	7	8	9	10	N+	N−
Learning orientation		+	+			+			+	+	5	0
Self management			+		+	−	+		+		4	1
Planning	+			+				+			3	0
Market orientation	+		+			−			+		3	1
Result orientation		+			+		+			−	3	1
Networking					+		+			+	3	0
Leadership				+		+			−		2	1
Problem analysis				+		−		+			2	1
Organising						+		+			2	0
Conceptual thinking		+									1	0
Negotiating	+										1	0
Persuasiveness											0	0
Vision											0	0
General awareness	−	−								+	1	2
Management control								−			0	1
Value clarification		−									0	1
Judgement							−		−		0	2
Team work		−			−						0	2
Strategic orientation			−	−				−			0	3
HRM/HRD	−		−	−	−		−			−	0	6
International orientation	−		−	−	−		−	−	−	−	0	8

Table III.
Strengths and weaknesses of the entrepreneurs based on average scores of multi-ratings of competencies

Note: The highest and lowest three averages are listed as + and −, and number of competencies on which the entrepreneurs score highest and lowest

Mulder, M., T. Lans, J. Verstegen, H.J.A. Biemans & Y. Meijer (2007). Competence development of entrepreneurs in innovative horticulture. *Journal of Workplace Learning, 19*(1), 32-44.

Eghe Osagie – CSR Competence (2016)

- Does the learning organization enhance corporate social responsibility?
- Which individual competencies support CSR?
- Which managerial roles are relevant for supporting CSR?
- Which competencies do CSR managers need for effective performance in their roles?
- Which learning activities enable CSR professionals to develop their competencies?

Osagie, E.R. (2016). *Learning and Corporate Social Responsibility A study on the role of the learning organization, individual competencies, goal orientation and the learning climate in the CSR adaptation process.* Dissertation. Wageningen: Wageningen University.

CSR Competencies

- **Cognition-Oriented Competence Domain**

1. Anticipating future developments regarding CSR-related challenges
2. Understanding of the interdependency between systems and subsystems relevant for CSR practice
3. Understanding CSR drivers, CSR standards, and CSR regulations

- **Functional-Oriented Competence Domain**

4. CSR management competencies

- **Social-Oriented Competence Domain**

5. Realizing CSR-supportive interpersonal processes in CSR integration

- **Meta-Oriented Competence Domain**

6. Employing CSR-supportive personal characteristics and attitudes
7. Personal value-driven competencies
8. Reflecting on personal CSR views and experiences

Osagie, E. R., Wesselink, R., Blok, V., Lans, T., & Mulder, M. (2016). Individual competencies for corporate social responsibility: A literature and practice perspective. Journal of Business Ethics. 135, 233-252. doi: 10.1007/s10551-014-2469-0

Current Extension Professional Competence

- (A) Cognitive competence domain
- (B) Functional competence domain
- (C) Social competence domain
- (D) Meta-competence domain

Holeta Agricultural College, Ethiopia

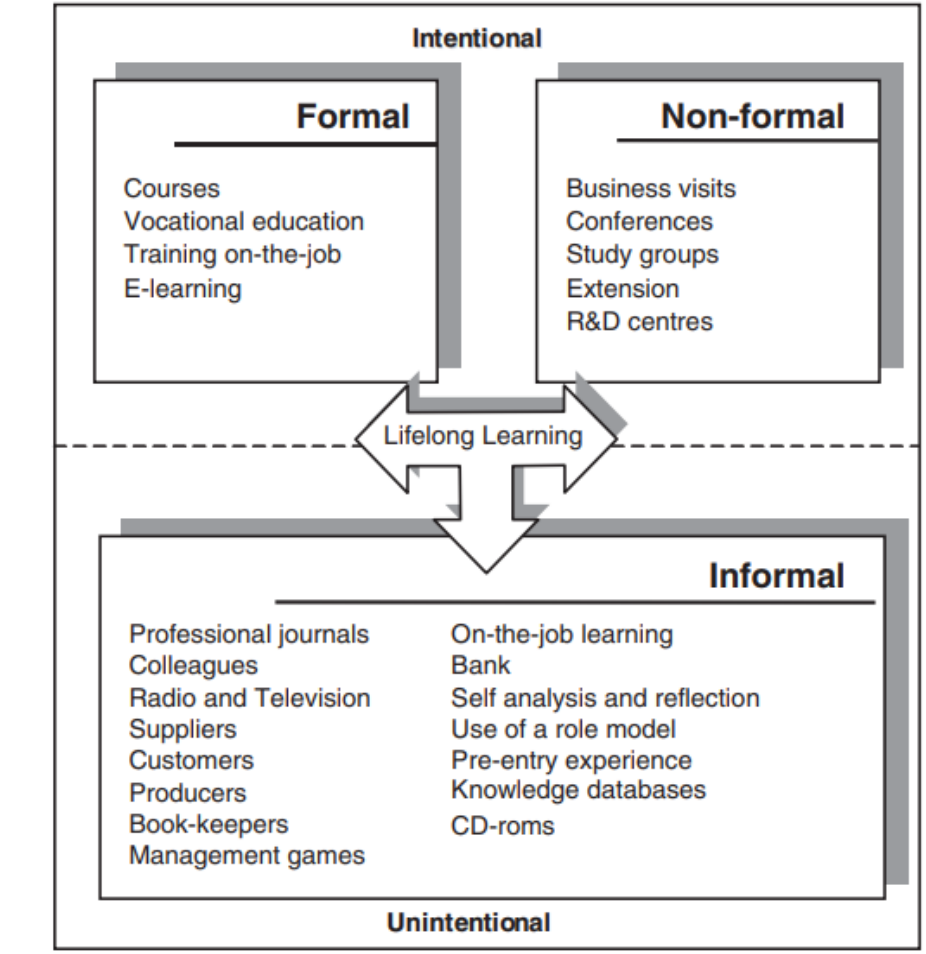
Tarekegne, C., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2017). Developing and validating a competence profile for Development Agents: an Ethiopian case study.
The Journal of Agricultural Education and Extension, 23(5), 427-441.

Breaking findings

- Smallholders who received training in the authentic work situations generally achieved better performance than those who received training in the farmer training centers
- Smallholder farmers who participated in the "Low-CBT" training situation showed lower performance (31quintals/hectare) than those who participated in the "High-CBT" groups (41 quintals/hectare). Training helps, as the baseline for both groups was 22 quintals/hectare. But the High-CBT group gained 45% more yield/hectare than the Low-CBT group

Chalachew Tarekegne Aniteneh, C.T. (2022). *Competence Profile Development and Effects of Competence-Based Training for Creating Change in the Agricultural Sector: The Case of West Gojjam Zone, Amhara State, Ethiopia. Dissertation.* Wageningen: Wageningen University

Work-related learning of farmers



Lans, T., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2004). Work-related lifelong learning for entrepreneurs in the agri-food sector. *International Journal of Training and Development, 8*(1), 73 - 89.

Learning activities of CSR managers

Learning Activities	*M* (*SD*)
A. Learning through social interaction ($M_{category}$ = 3.85)	
1. Discussions with others	4.19 (.72)
2. Collaborating with others	4.19 (.78)
3. Asking questions of / obtaining advice from others (e.g., colleagues with more or less experience, experts)	4.00 (.78)
4. Getting feedback from others	3.94 (.78)
5. Training others	2.91 (1.2)
B. Learning through critical reflection ($M_{category}$ = 3.78)	
1. Reflecting on experiences	3.91 (.80)
2. Evaluating/checking the information obtained	3.64 (.75)
C. Learning through experience ($M_{category}$ = 3.60)	
1. Looking for information (e.g., in books or on the Internet)	3.86 (.84)
2. Observing and imitating others (e.g., role models)	3.56 (.92)
3. Experimenting	3.53 (.96)
4. Performing in-role and extra-role tasks	3.45 (.94)
D. Learning through theory ($M_{category}$ = 2.35)	
1. Participating in online and offline training/course (courses shorter than one year)	2.47 (1.2)
2. Participating in formal education (courses one year or longer)	2.22 (1.3)

M (Mean) and SD (Standard deviation) scores are based on a 5-point Likert scale, ranging from
1 = not at all to
5 = very much

Osagie, E., Wesselink, R., Runhaar, P. & Mulder, M. (2018). Unravelling the Competence Development of Corporate Social Responsibility Leaders. The Importance of Peer Learning, Learning Goal Orientation, and Learning Climate. *Journal of Business Ethics, 151,* 891–906.

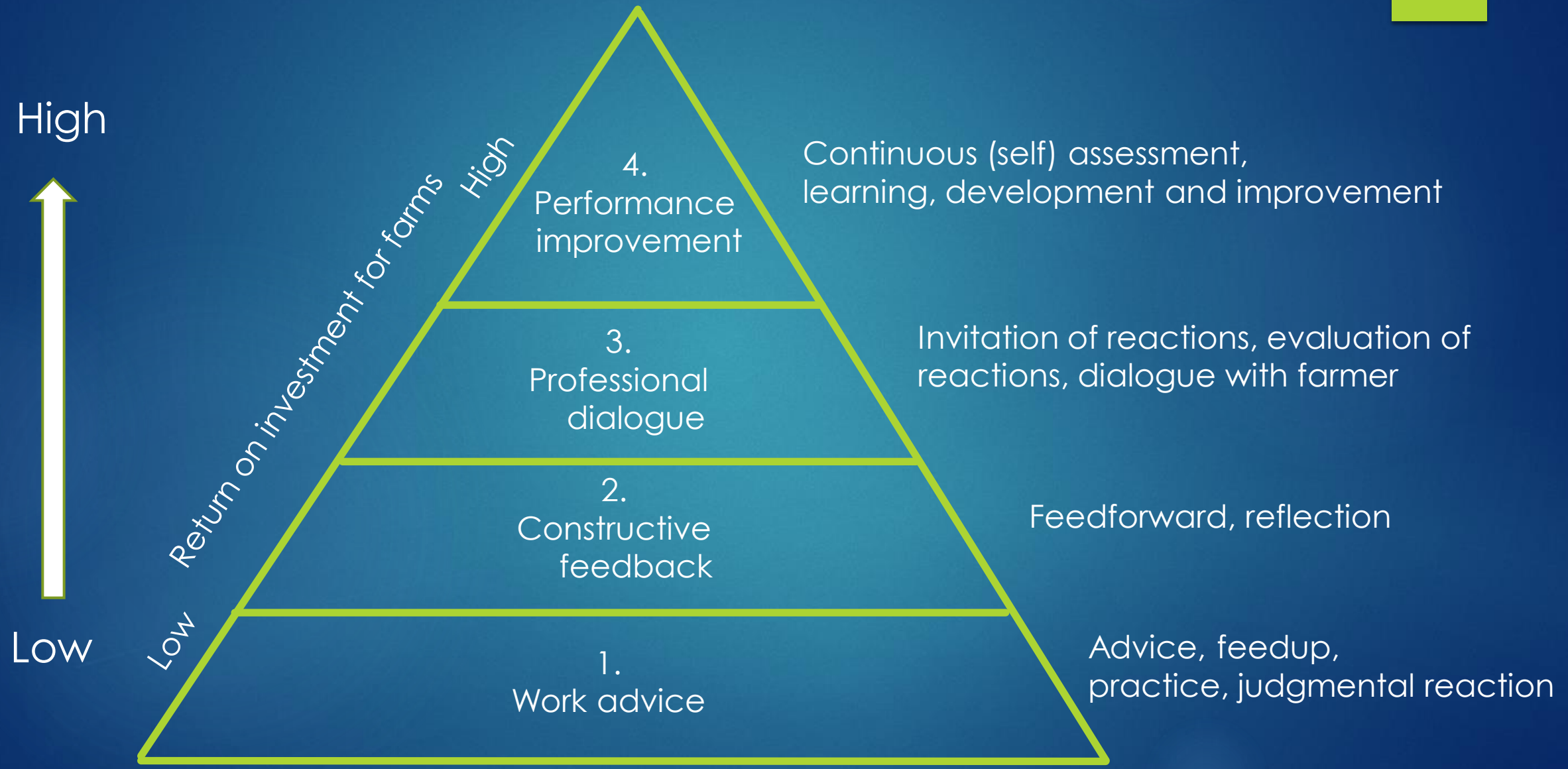
Learning activities of entrepreneurs

Entrepreneurial learning activity	*n*	%
Reflection	21	19.8
Observation	16	15.1
Experimentation	12	11.3
Performing occupational tasks	11	10.4
Checking information	9	8.5
Discussion	9	8.5
Conversation	6	5.7
Receiving feedback	6	5.7
Asking a specific question	5	4.7
Holding onto a personal vision	4	3.8
Replication	4	3.8
Acquiring knowledge through training	3	2.8
	106	100.0

Table V. Frequencies and percentages of learning activities of entrepreneurs mentioned in interviews (n = 10)

Mulder, M., T. Lans, J. Verstegen, H.J.A. Biemans & Y. Meijer (2007). Competence development of entrepreneurs in innovative horticulture. *Journal of Workplace Learning, 19*(1), 32-44.

Four Levels of Learning *in Farming*



Four fields of application

- Refocus Extension Education based on Core Competencies
- Align Extension Practice to Competence Frameworks of Farmers
- Implement Competence Management in Extension Organizations
- Define Competence Framework for BSc – MSc – PhD studies

Conclusions

- Competence is related with performance
- Professionals (including farmers) have competence profiles
- Competence can be developed, and thereby performance improved
- Competence development is a complex process
- Competence frameworks are needed
- A holistic view on competence is essential

www.shutterstock.com/search/drone+agriculture

Suggestions for BSc-MSc-PhD research

1. Design research on competence frameworks for all stakeholders in the agrifood sector
2. Design research on competence-based rural development practices
3. Assessment of the impact of competence-based advice on performance improvement
4. Assessment research on the mastery of key competencies of RDA professionals
5. Multistakeholder competence needs assessments in food production value chains
6. Appreciative inquiry on the performance improvement potential in the value chain
7. Case studies on performance improvement in practice
8. Field experiments on RDA professionals using different levels of practical learning
9. Experimental research on learning results of feedback quality
10. Impact analysis of the use of Virtual Reality and AI applications

Use advanced methods of data collection and analysis

- Competence self assessments
- Multi-rater assessments
- 360 degrees assessments
- Assessment by licensed assessors
- Assessment centers
- Observations of performance
- Think-aloud protocols
- Video-stimulated recall
- Case studies on analysis of work

Mulder, M. (2021). Competence Theory and Research. Webinar for Young Researchers in VET, ITB Bremen, November 9, 2021

Thanks!

MM Consultancy
for Education and Training

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- Google citations: http://scholar.google.com/citations?user=pw2srdQAAAAJ
- LinkedIn: https://www.linkedin.com/in/profmartinmulder

Further information

Extension professional competence

- **(A) Cognitive competence domain**

1. Understanding and organizing subject matter for farmers' learning
2. Using principles of adult training and development to facilitate the learning process of farmers
3. Using learning methods and intellectual versatility to advance the understanding of farmers of farming practices
4. Understanding extension-related regulations, research & research findings, and technology
5. Understanding agro-ecological farming practices

Tarekegne, C., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2017). Developing and validating a competence profile for Development Agents: an Ethiopian case study. *The Journal of Agricultural Education and Extension*, *23*(5), 427-441.

Extension professional competence

6. Understanding strategies of adaptive farming management
7. Providing/implementing rural advisory services based on entrepreneurship principles
8. Understanding the interaction among gender and extension, HIV/AIDs/health of farmer and extension, systems and subsystems
9. Understanding human behavior and individual differences/knowledge about farmers

Tarekegne, C., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2017). Developing and validating a competence profile for Development Agents: an Ethiopian case study. *The Journal of Agricultural Education and Extension*, *23*(5), 427-441.

Extension professional competence

- **(B) Functional competence domain**

10. Agricultural extension management competence
    10. Extension leadership competence
    11. Program planning and objective preparation competence
11. Demonstrating multi-production farming practice competence

Tarekegne, C., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2017). Developing and validating a competence profile for Development Agents: an Ethiopian case study. *The Journal of Agricultural Education and Extension*, *23*(5), 427-441.

Extension professional competence

- **(C) Social competence domain**

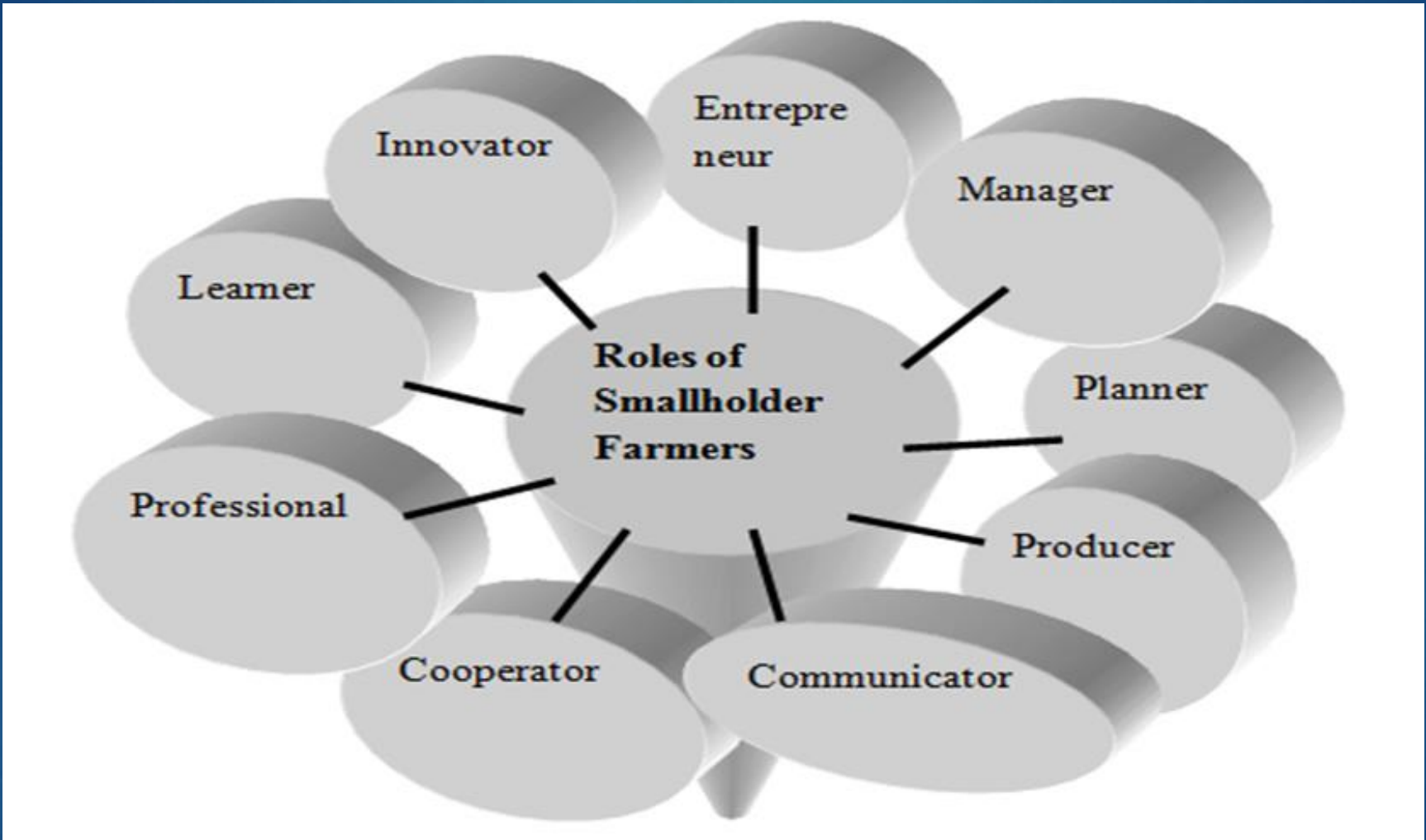
12. Realizing extension communication and relation building processes

- **(D) Meta-competence domain**

13. Applying extension advisory-facilitative personal characteristics and affective attributes in extension advising context
14. Reflecting on personal extension advising views and professional experiences: self-knowledge
15. Extension professionals' ethical competence

Tarekegne, C., Wesselink, R., Biemans, H.J.A., & Mulder, M. (2017). Developing and validating a competence profile for Development Agents: an Ethiopian case study. *The Journal of Agricultural Education and Extension*, *23*(5), 427-441.

Roles of smallholder farmers



Tarekegne, C., Wesselink, R., Biemans, H. J. A., & Mulder, M. (2021). Developing and validating a competence framework for improving the productivity of smallholder farmers: a case study from Ethiopia. *The Journal of Agricultural Education and Extension*,27(5), 481-502.

Task domains of farmers

1. Pre-planting crop management
2. During-planting crop management
3. After-planting crop management
4. During-harvesting crop management
5. Post-harvesting crop management
6. Facilitating all farming activities

Tarekegne, C., Wesselink, R., Biemans, H. J. A., & Mulder, M. (2021). Developing and validating a competence framework for improving the productivity of smallholder farmers: a case study from Ethiopia. *The Journal of Agricultural Education and Extension*,27(5), 481-502.

Importance of tasks by role

Job Fields and Tasks	Roles								
	LE	IN	EN	MA	PL	PR	CM	CP	PRF
1. Pre-planting crop management									
▪ Specifying the challenges of climate change	+	+	+-	+ +	+	+	+	+	+
▪ Assessing the competitive behavior of other actors in the farming business	+	+	+	+ +	+	+	+	+	+
▪ Executing market analysis on inputs, outputs, and what, how, and when to produce	+	+-	+-	+ +	+	+	+	+	+
▪ Specifying leadership functions in farming practice	+	+ -	+-	+ +	+	+	+	+	+
2. During-planting crop management									
▪ Applying innovative farming methods	+	+	+ -	++	+	+	+-	+	+
▪ Capturing the complex and dynamic interactions among systems and subsystems	+	+	+ -	+ +	+	+	+-	+	+
▪ Implementing nature-friendly and sustainable farming practices	+	+	+ -	+ +	+	+	+-	+	+
▪ Managing human and non-human resources	+	+	+ -	+ +	+	+	+	+	+
3. After-planting crop management									
▪ Monitoring and evaluating farming activity regularly	+	+-	+ -	+	+ -	+ +	+ -	+ -	+ +
▪ Improving soil fertility	+	+	+ -	+	+ -	+ +	+ -	+ -	+ +
▪ Controlling weeds, plant diseases, and pests	+	+	+ -	+ +	+ -	+ +	+ -	+ -	+ +
▪ Caring for animal/human health and the ecosystem	+	+-	+ -	+ +	+ -	+ +	+ -	+ -	+ +
4. During-harvesting crop management									
▪ Specifying time	+	+-	+ -	+ -	+	+ +	+ -	+ -	+ -
▪ Specifying the crop collection and threshing system	+	+	+ -	+ -	+	+ +	+ -	+ -	+ -
▪ Specifying the proper storage system	+	++	+ -	+	+	+ +	+ -	+ -	+ -
5. Post-harvesting crop management									
▪ Specifying causes of poor yield/hectare	+	+-	+	+ +	+	+ +	+	+	+ -
▪ Executing cost-benefit analyses	+	+-	+	+ +	+	+ +	+	+	+ -
▪ Engaging in agro-processing activities	+	+ +	++	+ +	+	+ +	+	+	+ -
▪ Enhancing information flow	+	+	+	+ +	+	+	+ +	+	+ -

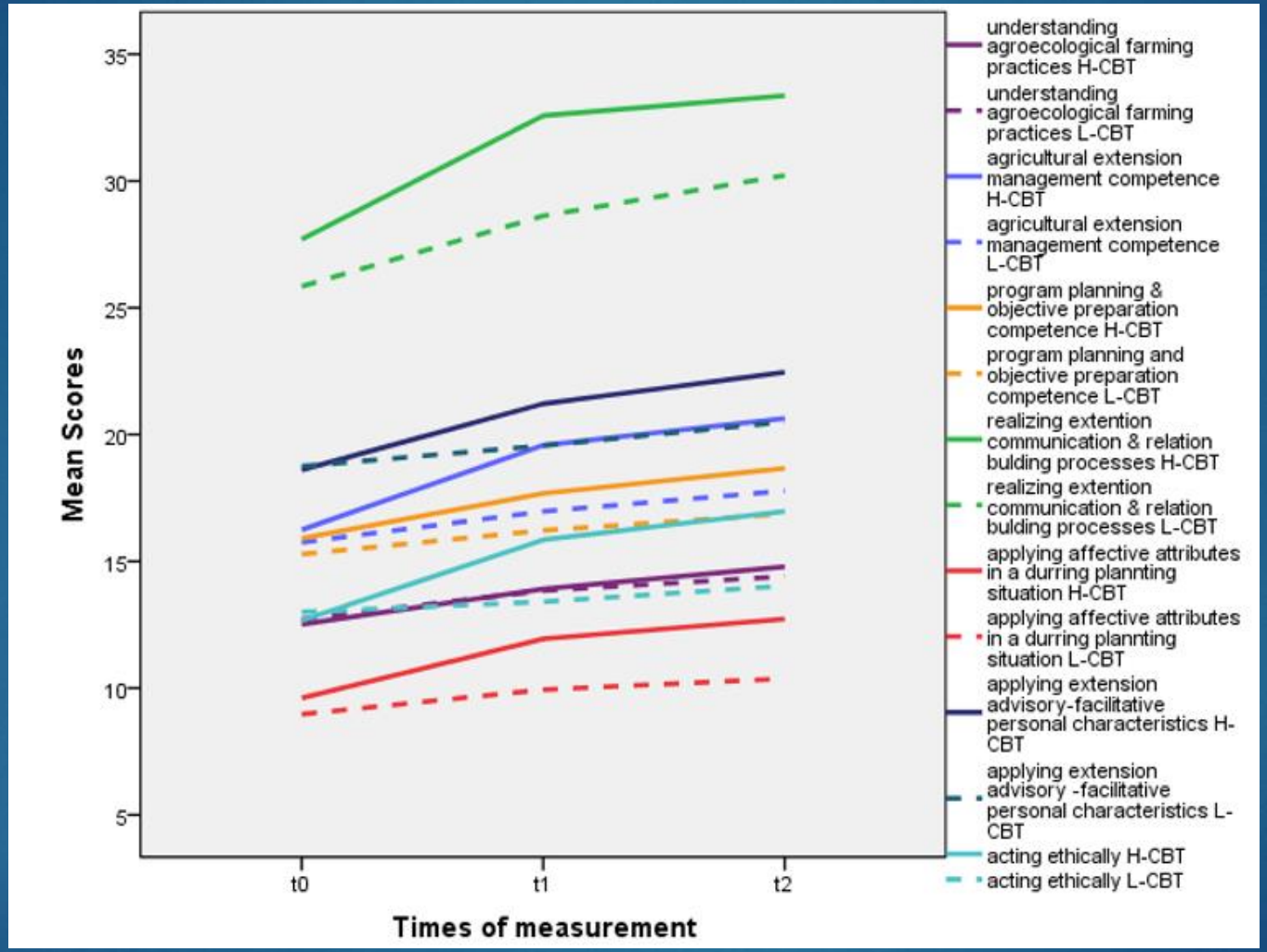
LE = Leaner; IN = Innovator; EN = Entrepreneur; MA = Manager;
PL = Planner; PR = Producer; CM = Communicator; CP = Cooperator; PRF = Professional

Competencies by Roles

Competencies	Roles								
	LE	IN	EN	MA	PL	PR	CM	CP	PRF
Developing/Writing	■	■			■				
Integrating Capability	■				■				
Assessment	■							■	
Explaining/Justifying Capability	■							■	
Organizing/Assembling	■	■			■		■		
Identification		■					■		
Reviewing		■					■		
Problem-solving		■		■					
Creating new knowledge		■				■			■
Application	■	■	■	■		■			■
Understanding			■	■		■			■
Influencing			■	■	■				
Negotiating			■	■	■				
Persuading			■	■	■				
Analyzing abilities	■		■	■		■			
Interpreting				■					
Demonstrating				■				■	■
Recognition/acknowledgement				■		■			
Decision-making				■		■			
Networking					■	■	■	■	
Building engaged relationships							■	■	

Tarekegne, C., Wesselink, R., Biemans, H. J. A., & Mulder, M. (2021). Developing and validating a competence framework for improving the productivity of smallholder farmers: a case study from Ethiopia. *The Journal of Agricultural Education and Extension*,27(5), 481-502.

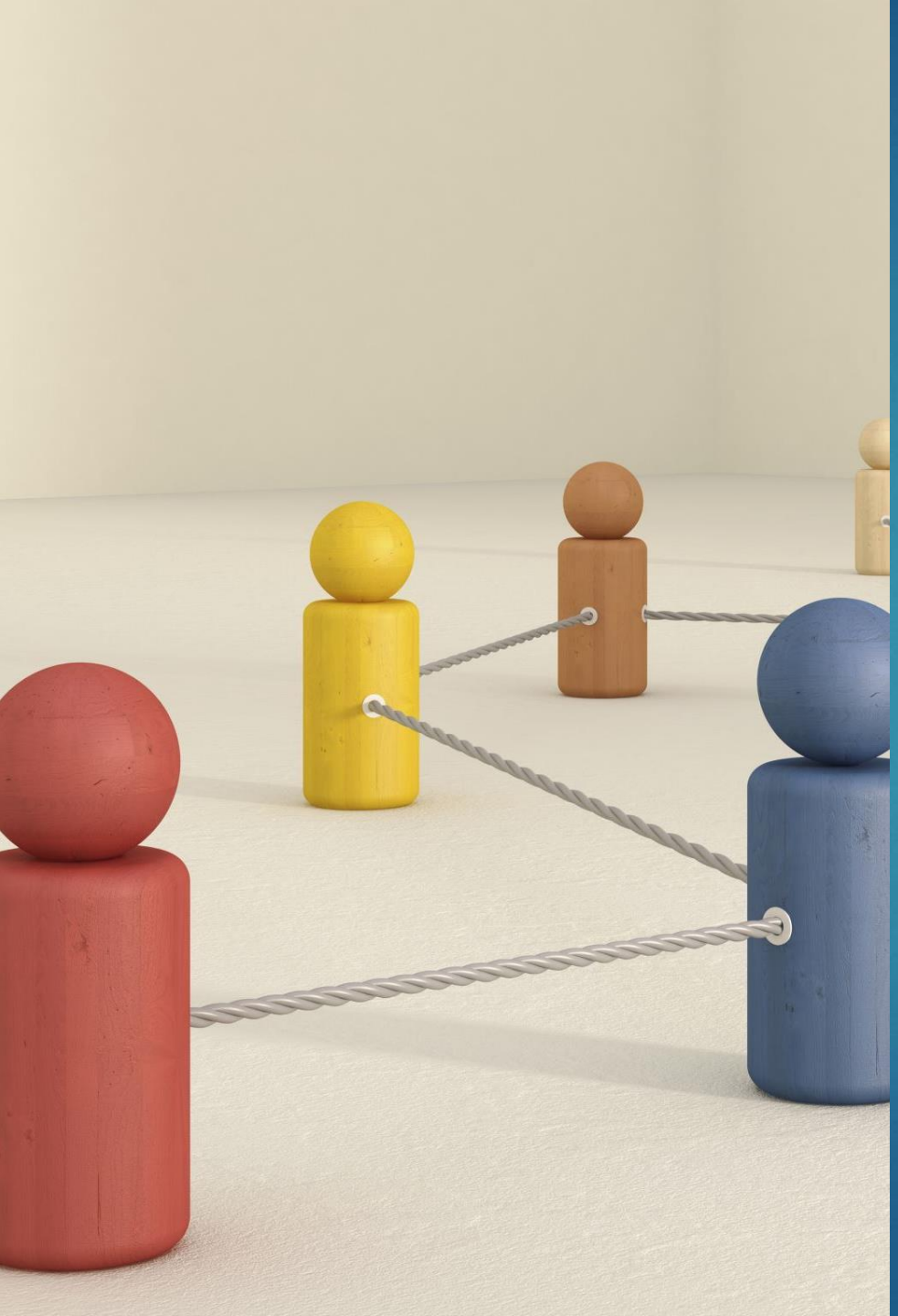
Learning curves of L/H CB Training



L CB Training = training in which competence principles are included at Low level (dashed lines)

H CB Training = training in which competence principles are included at High level (unbroken lines)

Tarekegne, C., Wesselink, R., Biemans, H. J., & Mulder, M. (2022). Effectiveness of a Competence-Based Planting Support Training Program for Development Agents in Ethiopia. *International Journal of Training and Development,* 1-26. DOI: 10.1111/ijtd.12265



Refocusing Education based on Core Competencies at Wageningen University

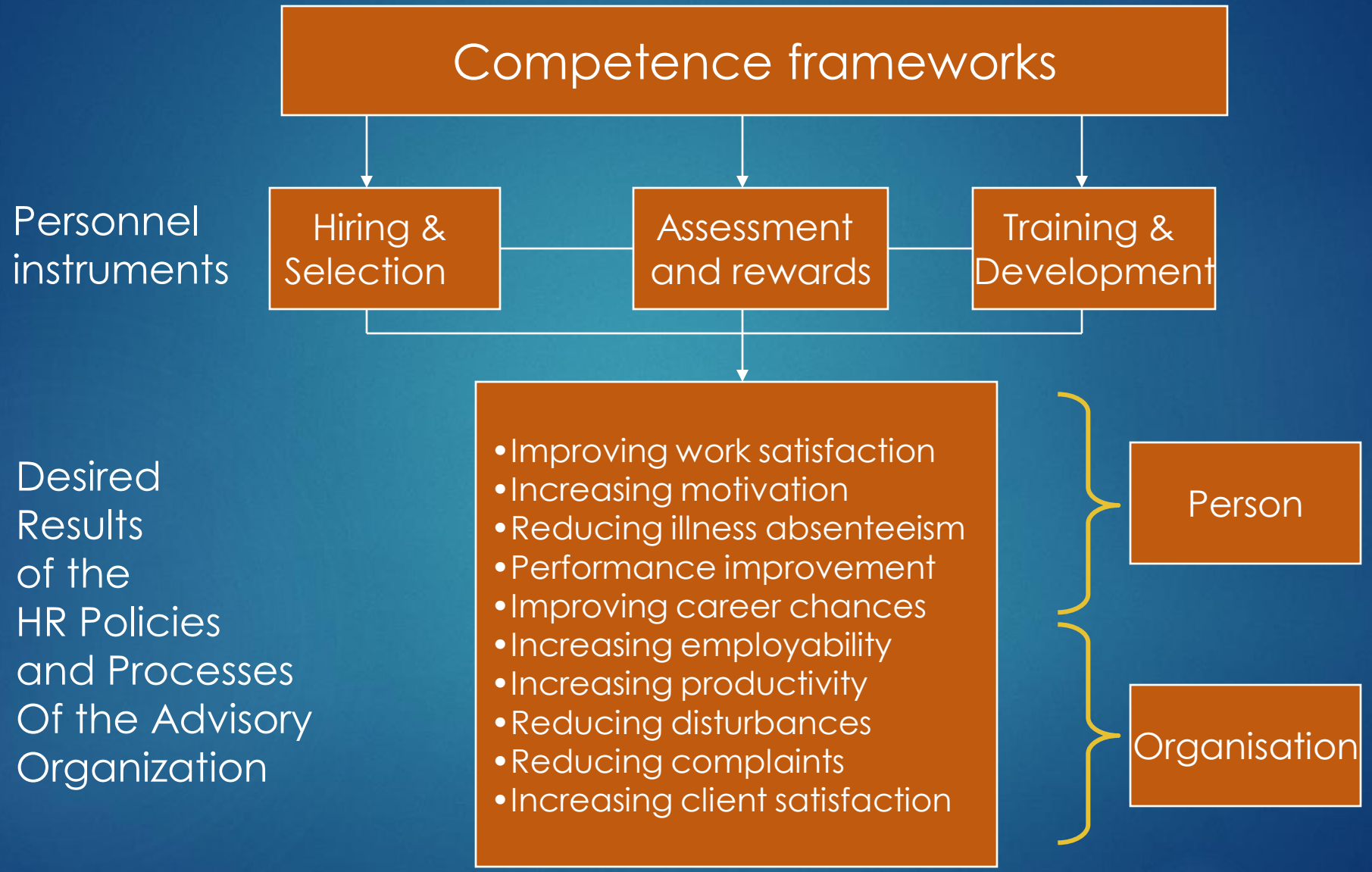
- (Core) competence profile
- Positioning by Bachelor, Master and PhD
- Core competencies in learning outcomes
- Courses-competence mapping
- Projection of learning lines
- Competencies addressed by separate courses
- Inclusion of authentic learning situations
- Now oriented towards active learning and challenge-based learning

Principles of Competence-Based Extension Education and Training

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

Competence Development - Alignment of HR Instruments



Mulder, M. (2002). *Competentieontwikkeling in organisaties. Perspectieven en praktijk.* 's-Gravenhage: Elsevier Bedrijfs Informatie.

Use of instruments for competence development

Rank	Competence Instrument	Yes	No
1	Define the core competency of the organisation	608	104
2	Arrange facilities for learning	562	152
3	Use of personal development plans	459	231
4	Develop competence profiles of job families	454	210
5	Develop competence based personnel management	435	228
6	Develop competence profiles of job holders	423	204
7	Distinguish competence centres	418	238
8	Using competence assessment in selection of new employees	388	245
9	Acknowledge informally acquired competence	381	239
10	Using competence assessment for employee evaluation	374	281
11	Market products/services with competence on the label	358	283
12	Assign coaches to employees for competence development	284	361
13	Appoint competence managers	267	348
14	Use of competence assessment in remuneration	177	441

N=1,022; region: EU

Mulder, M. & K. Collins (2007). *Competence Development in Organisations: Its Use in Practice.* Paper presented at the Annual Meeting of the AERA, Chicago, April 9-13. Wageningen: Wageningen University, ECS.

Define and Implement Competence Framework of PhD studies

- Research Skills and Knowledge
- Responsible Conduct of Science
- Teaching
- Communication
- Personal Effectiveness
- Professional Development
- Leadership and Management

PhD Competence Model - Graduate School of Life Sciences - Utrecht University (uu.nl)