Stellenbosch
UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

forward together
sonke siya phambili
saam vorentoe

A capstone project to enhance entrepreneurial and other critical skills in students of selected AgriSciences Departments

11 May 2023 – Quarterly TLA seminar - DLTE

Albert Strever

aestr@sun.ac.za

Overview

I. Introduction
II. Current state of entrepreneurship education in AgriSciences
III. TAU fellowship project
IV. Engineering management research assignment
V. Conclusions, road forward

Entrepreneurship & Innovation @ SU

Institutional scope

1. One of the 7 identified Game Changers which will form future strategy
2. From a siloed approach to integration into they key activities at SU
   - Research & Innovation
   - Teaching & Learning
   - Community interaction

Game changers:

1. Transformation
2. Systemic sustainability
3. Digital transformation
4. Programme renewal/hybrid learning assessment
5. Innovation/Entrepreneurship
6. Internationalisation
7. Governance/Matrix organisation

Futures thinking workshop

Stellenbosch Business School
Responsible Leaders – we shape them.

Doris Viljoen
June 2022

EQUIS ACCREDITED
ASSOCIATION AMBA ACCREDITED
AACSB ACCREDITED

Stellenbosch Business School
Responsible Leaders – we shape them.

ENTREPRENEURSHIP WITHIN THE AGRISCIENCES CONTEXT

Activity 1: 10 minutes

1. What is entrepreneurship?

- Identify elements

2. What do we regard as outside the boundaries of our definition?

- Identify elements

Stellenbosch Business School
Responsible Leaders – we shape them.

ENTREPRENEURSHIP AT SU AGRISCIENCES

Activity 2: 10 minutes

Why could it be a good thing? (Or not)

Students

Faculty

Industry

EQUIS ACCREDITED
ASSOCIATION AMBA ACCREDITED
AACSB ACCREDITED

Stellenbosch Business School
Responsible Leaders – we shape them.

ENTREPRENEURSHIP AT SU AGRISCIENCES

Latents: seeds of the future

Activity 3: 10 minutes

Do we have access to useful elements already?

Stellenbosch Business School
Responsible Leaders – we shape them.

ENTREPRENEURSHIP AT SU AGRISCIENCES

15 minutes

It is 2026 and Entrepreneurship is firmly established

1. What does it look like?

2. What happened?

Why did we do it this way?
How did we get it right?
Who is involved?
What was the main issues?

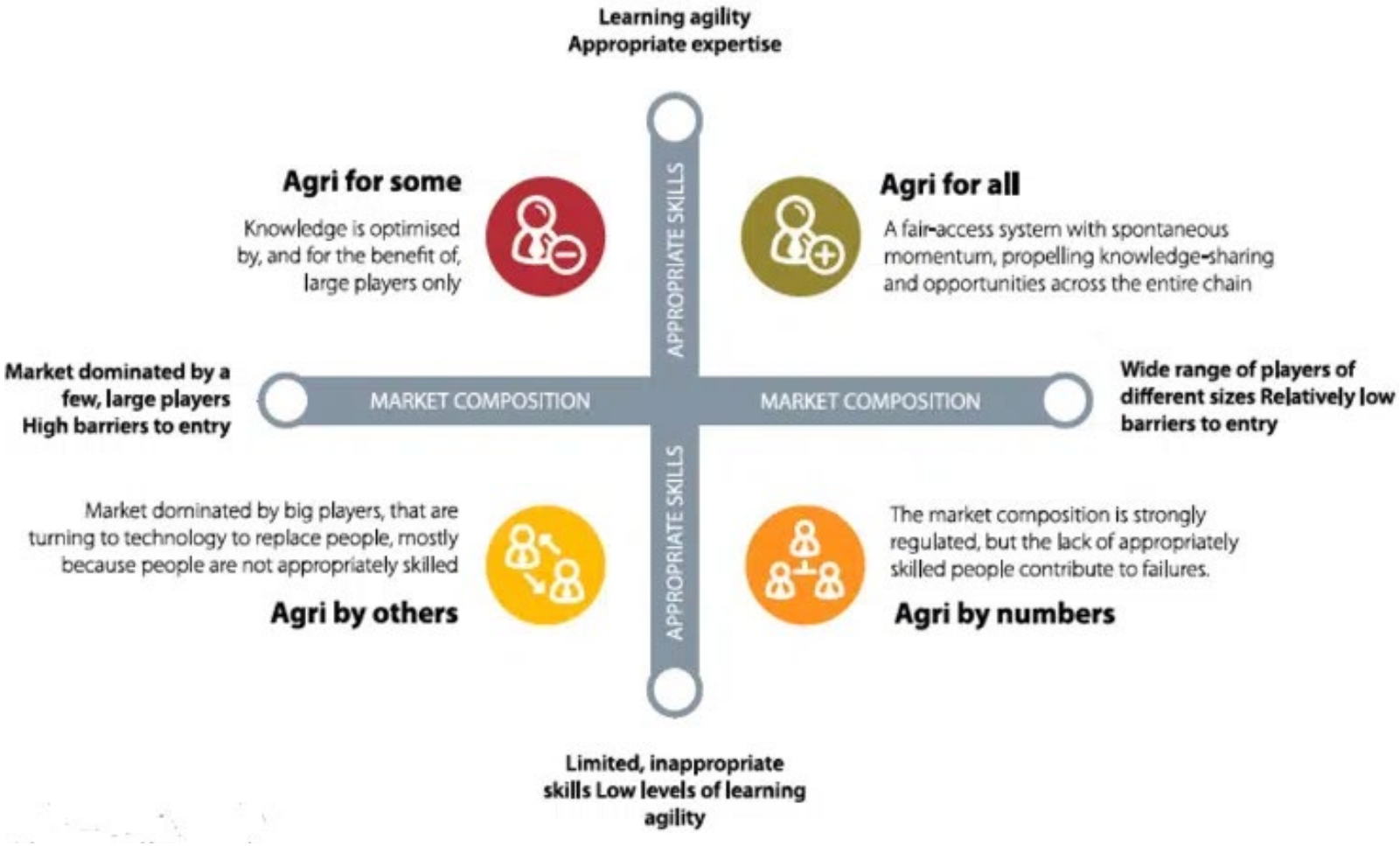
3. We are praised for …

… by the industry
… by students
… by faculty

https://www.agriorbit.com/report-launched-on-agri-skills-needed-for-the-future/

Thinking again. . . .or thinking forward? (IFR, 2022)

- Doris Viljoen (IFR)
  - Scenarios about future of work in the agri industry by 2035.
- "skills need for the future of work in the agri industry is a mixed bag"
- "In short, the skills needed for a healthy agri industry consists of
  - "soft skills"
  - natural science
  - systems thinking
  - technology integration
  - data management



From: https://www.agriorbit.com/report-launched-on-agri-skills-needed-for-the-future/

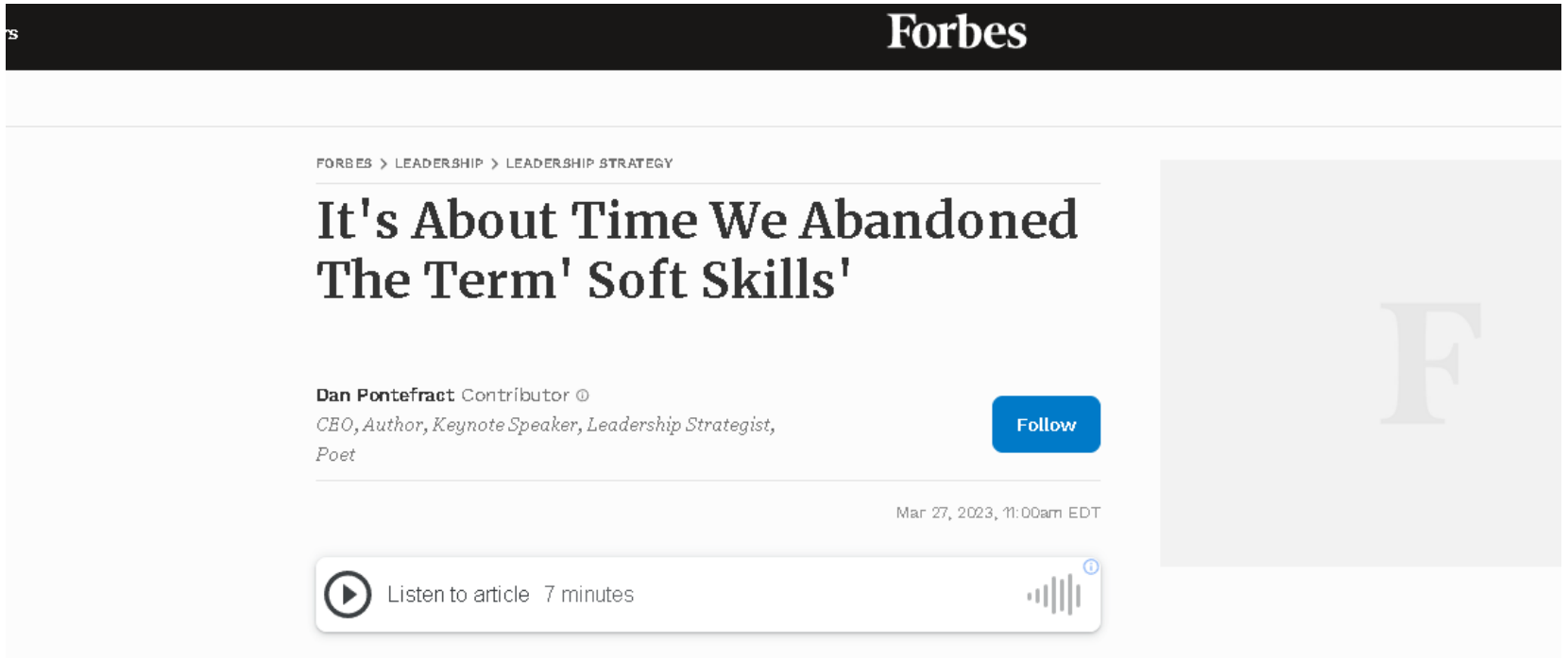
Definitions

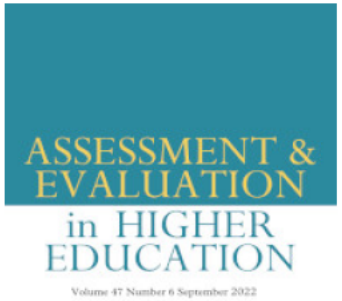
- Skills (Tonderai, 2022)
  - Learned and applied abilities that **use** one's knowledge effectively in execution or performance
  - I.e. in making business decisions, certain skills are needed to execute those decisions.
  - I.e. budgeting, market research and competitive strategy.
- Competencies
  - Knowledge, behaviours, characteristics or abilities (Tonderai, 2022), made up of skills, positive values and attitudes (Chan et al. 2017, Wong et al 2022).
  - I.e. ability to make business decisions.

“Soft” or professional skills?

- Pontefract, 2023 referring to “soft skills”:

“They form the bedrock of effective leadership, i.e. through communication, problem-solving, critical thinking, emotional intelligence, and teamwork, and deserve the label ‘professional skills’”





Routledge
Taylor & Francis Group

Assessment & Evaluation in Higher Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/caeh20

A systematic review on the learning outcomes in entrepreneurship education within higher education settings

Hannah Y. H. Wong & Cecilia K. Y. Chan

Learning outcomes of ENT education (from Wong et al 2022)

Entrepreneurial intention

- Widely cited outcome (Pittaway and Cope 2007; Nabi et al. 2017).
- Definitions
  - students having ‘intentions to start their own businesses in the future’ (Yar et al, 2008)
  - ‘intention to be entrepreneurs’ (Matlay et al. 2015)
- Entrepreneurship and self-employment as a future career

Entrepreneurial competencies

- Inyang and Enuoh (2009) - a cluster of values, attitudes and skills within entrepreneurial competencies
  - time management, communication, marketing management and leadership
- Mitchelmore and Rowley (2010)
  - Idea generation, environmental scanning, recognising/envisioning opportunities.
- Discipline specific?

South African Journal of Economic and Management Sciences
ISSN: (Online) 2222-3436, (Print) 1015-8812

Entrepreneurial competencies and financial performance of farmers in South Africa

Authors:
Simone Nieuwoudt[1]
Johannes I.F. Henning[1]
Henry Jordaan[1]

Affiliation:
[1]Department of Agricultural Economics, University of the Free State, South Africa

Corresponding author:
Simone Nieuwoudt,
simonenieuwoudt34@gmail.com

Dates:
Received: 04 Aug. 2016
Accepted: 30 June 2017
Published: 15 Dec. 2017

How to cite this article:
Nieuwoudt, S., Henning, J.I.F. & Jordaan, H., 2017, 'Entrepreneurial competencies and financial performance of farmers in South Africa', *South African Journal of Economic and Management Sciences* 20(1), a1640. https://doi.org/10.4102/sajems.v20i1.1640

Aim: The main objective of this study was to explore the relationship between the entrepreneurial competencies of farmers and their financial performance.

Setting: The study was conducted in South Africa among farmer clients of a commercial financial organisation.

Methods: The financial performance of the farmers was calculated by means of financial ratios which were used to compile a single performance indicator: operating efficiency. The operating efficiency indicator was calculated using a financial-based data envelopment analysis. An entrepreneurial competencies instrument was used to measure the entrepreneurial competencies of the farmers. Ordinary least squares regression was used within the principal component regression framework to explore the relationship between entrepreneurial competencies and financial performance.

Results: The results indicate there is a positive relationship between entrepreneurial competencies and financial performance of farmers. Each of the individual competencies also indicated positive correlation between the entrepreneurial competencies and financial performance.

Conclusion: An increase in specific entrepreneurial competencies behaviour may increase the operating efficiency of the farm. Educational opportunities exist to educate farmers on the potential benefits of using entrepreneurial behaviour to their advantage (to benefit their operating efficiency). Sectors involved with agriculture, for example agricultural advisors, financial advisors and educational institutes, should emphasise the importance of utilising the competencies of farmers.

Introduction and background

Agriculture is one of the most important sectors within the South African economy, as it contributes to the economy in terms of employment, Gross Domestic Product (GDP) and rural development, among others. In 2015, the direct contribution of primary agriculture to the South African GDP

Agriculture and entrepreneurial competencies

- A need in entrepreneurship research to **contextualise** the understanding of the concept – review by Fitz-Koch et al, 2018 specifically on agricultural entrepreneurship.
- I.e. Nieuwoudt (2016) - 10 entrepreneurial competencies related to agriculture (from Man, 2001)
    1. Opportunity competencies
    2. Relationship competencies
    3. Conceptual competencies (analytical competencies and innovative competencies)
    4. Organising competencies (operational competencies and human competencies)
    5. Strategic competencies
    6. Commitment competencies
    7. Learning competencies
    8. Personal strength competencies

Underpinning entrepreneurial competencies (prof Patrick Shulist)

- **Internal locus of control**
- **Self-efficacy**
- **Motivation**
- **Persistence and commitment**
- **Persuasion**
- **Taking-initiative**
- **Calculated risk-taking**
- **Accepting failure**

In many ways, these competencies are needed *regardless* of the career path a student follows

CA2025 STUDENT PORTFOLIO OF EVIDENCE

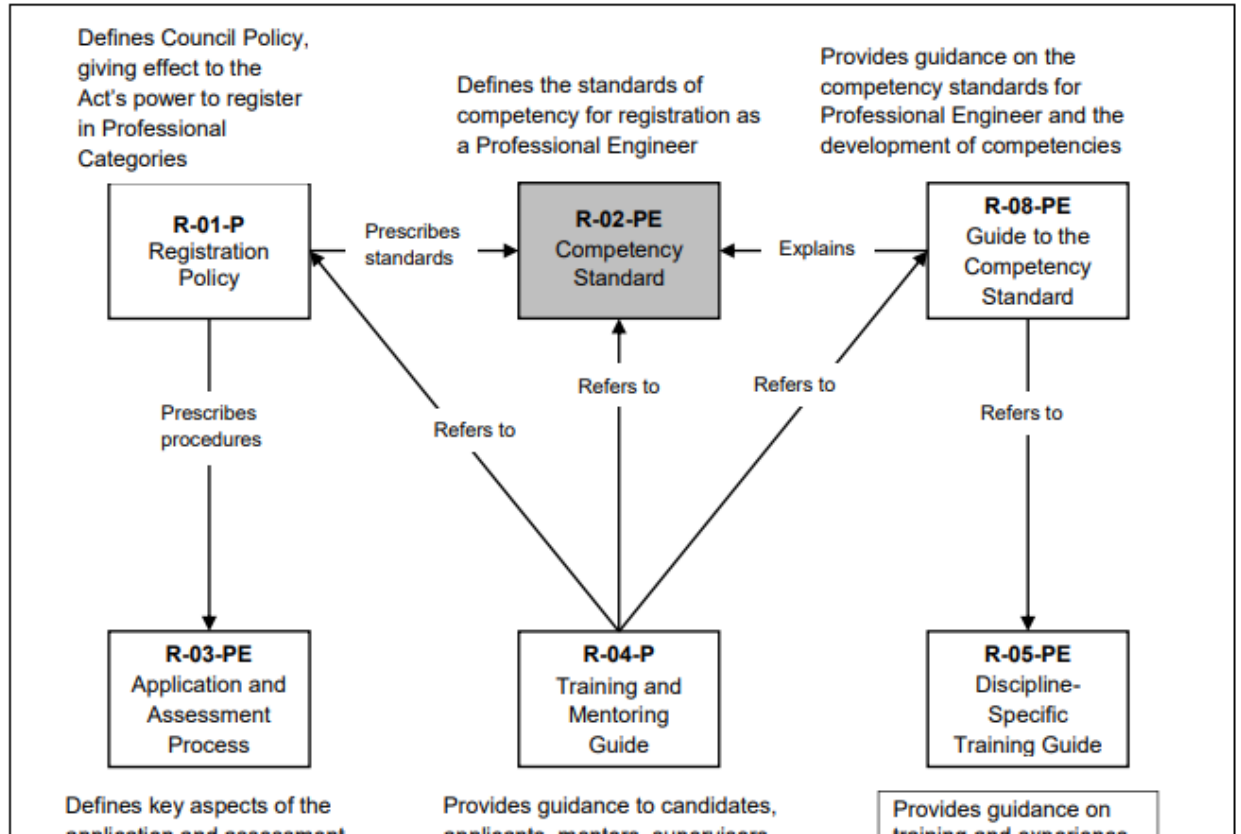
DR GRETHA STEENKAMP

WHAT IS CA2025?

- SAICA accredits universities to train future CAs; they determine our syllabus
- SAICA focusses on competencies (rather than just knowledge)
- SAICA brought out a new competency framework called CA2025 CF
- Increased focus on digital/IT skills (e.g. automation, programming, data analytics), ethics, citizenship as well as integrated and critical thinking

BACKGROUND: ECSA REGISTRATION SYSTEM DOCUMENTS

The illustration below defines the documents that comprise the Engineering Council of South Africa (ECSA) system for registration in professional categories. The illustration also locates the current document.



Questions, Positioning and Partnerships

- Should we and how much?
- Inside curriculum? Co-curricular? Extra-curricular?
- Who presents it?
- F2F, Hybrid, Fully online?
- Partners, i.e. USB-Ed, other faculties integration?, INNOVUS & LaunchLab

Benefits of integration in current curricula

- Overlapping outcomes of Entrepreneurship education and needed professional skills +competencies
- I.e. . . . . .
  - Awareness about **business types** and objectives (i.e. different types of entrepreneurship)
  - **Groupwork, problem solving, personal strengths and weakness** discovery
  - **Case studies** can be discipline and subject-specific while integrating into current theoretical work – example on next slide
  - Integration of **new techniques/technologies and approaches** – AI tools (example literature reviews and business plan assessment).

Undergraduate Entrepreneurship Activities

Scoping and current offerings. . .

- Other Faculties
  - EMS (Accounting, Business Sciences)
  - Engineering
  - Science (Joint entrepreneurship crash course in 2022 with our FOW students)
- Our Faculty
  - Food Science NPD course (4th years)
  - Genetics 345 (Economic, legal and other non-biological aspects of biotechnology)
  - Entrepreneurship 2 and 3 (EMS) – selected Agri Econ students
  - "Future of Wine" final year module – now extended to 2nd, 3rd and 4th year

forest21.org

Most used | Academic Research... | AI tools | Websites | Cloud | Coding Python | GEMS and SU Agri I... | Apps platforms agri | Microsoft Sway – M... | Other bookmar

Co-funded by the Erasmus+ Programme of the European Union

Forest 21

Climate-Smart Forestry Entrepreneurs

About | News | Student projects | Partners | More

Forestry Educators' Ethics

cators have a responsibility to train students to
for both current and future generations.

practice pedagogies that will develop knowledge
ur students to maintain the long-term capacity of the
e the variety of materials, uses, and values desired
s and society."

Latest News

Forest21 member institution hosted South Africa Deputy Minister

Forest 21 – Seven Entrepreneurship Professional Development sessions

SESSION 0: OVERVIEW OF PROFESSIONAL DEVELOPMENT PACKAGE

0.1 Overview of Package

SESSION 1: INTRODUCTION TO ENTREPRENEURSHIP

1.1 Session introduction + The importance of entrepreneurship
1.2 Obstacles to entrepreneurship
1.3 What IS entrepreneurship?
1.4 How entrepreneurship fits into this project
1.5 Encouraging students to be entrepreneurs

SESSION 2 THE ENTREPRENEURIAL PROCESS

2.1 Conceptual starting point
2.2 Some examples
2.3 Curriculum: What does this mean for students?

Forest 21 – Seven Entrepreneurship Professional Development sessions

SESSION 3 DEVELOPING AN ENTREPRENEURIAL MINDSET

3.1 Who becomes an entrepreneur?
3.2 What we can teach students + where to focus
3.3 Seeing oneself as an entrepreneur – conceptual background
3.4 Seeing oneself as an entrepreneur – exercises examples
3.5 Seeing the world as non-fixed – conceptual background
3.6 Seeing the world as non-fixed – exercise examples
3.7 Curriculum: What does this mean for students?

SESSION 4 DEVELOPING ENTREPRENEURIAL IDEAS

SESSION 5 STARTING A BUSINESS

SESSION 6 INTEGRATING ENTREPRENEURSHIP INTO THE CURRICULUM

SESSION 7 CREATING AN ENTREPRENEURIAL ECOSYSTEM

Grapevine and Wine Sciences 454
(New in 2021 Semester 2)

“The Future of Wine”

Prof. Florian Bauer, Dr. Albert Strever, Dr. Anscha Zietsman

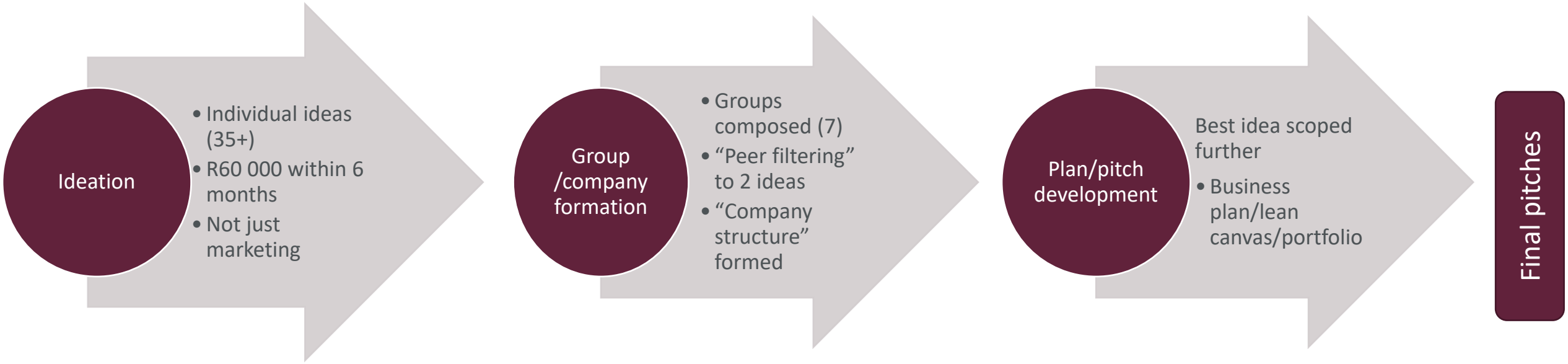
Future of wine course 2021/2022

GWS 454

- Used principles of Design Thinking, Customer Discovery
- Built subject-specific material from MIT “New Enterprises” Open courseware
- Based on Bill Aulet’s “Disciplined Entrepreneurship”, 24 steps towards a successful startup (www.d-eship.com)
- Supplemented by inputs from prof Patrick Shulist (AALTO) and prof Tim Dafforn (Birmingham) (3 day Winter School with Polymer Science: “Introduction to Entrepreneurship”).

Course setup (6 weeks. . .)

- Objective: To learn how to identify, organize and build a new enterprise within the context of the wine industry



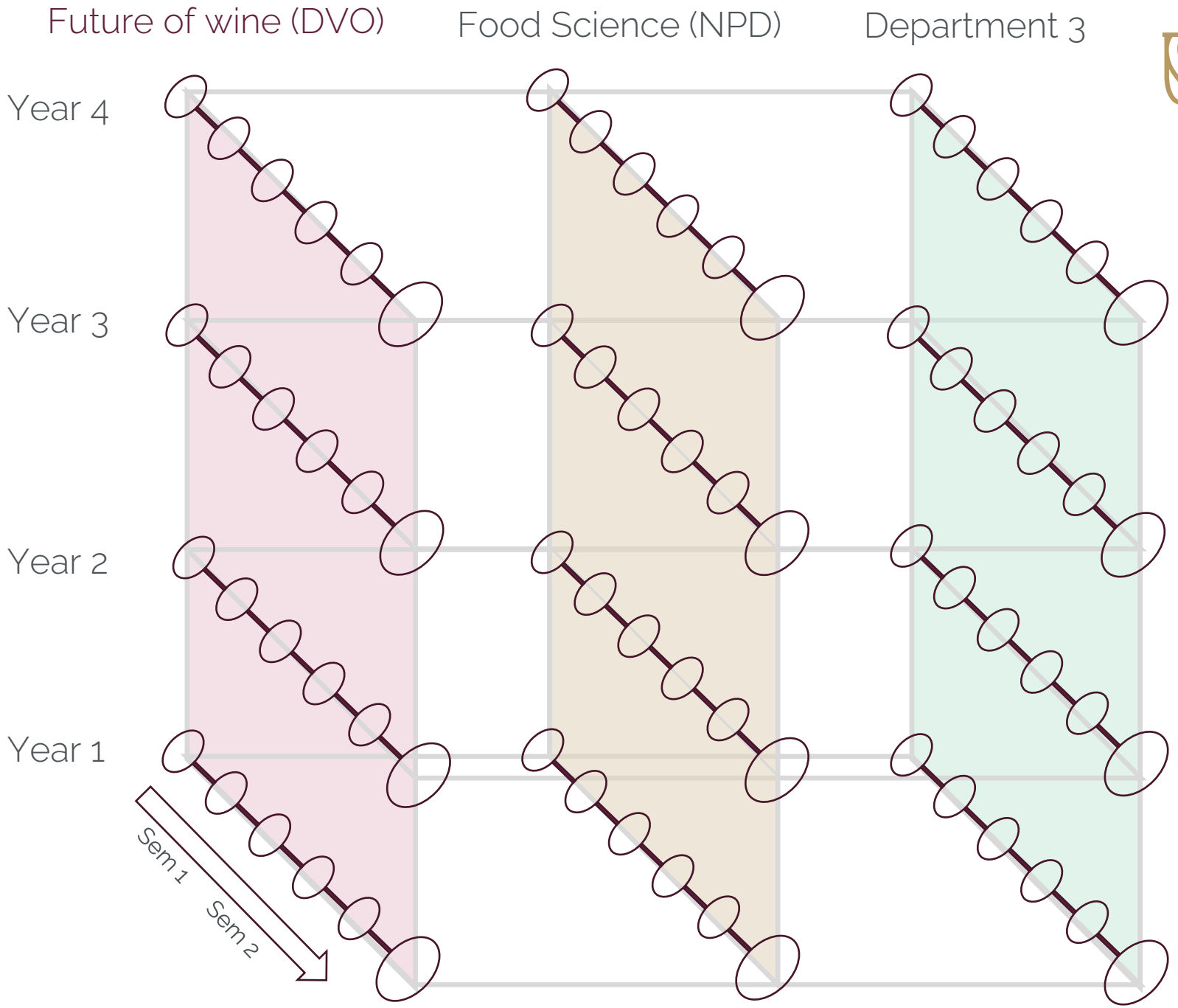
TAU 4 Fellowship

- **Project title:** *A capstone project to enhance entrepreneurial and other critical skills in students of selected AgriSciences Departments.*

Capstone principle

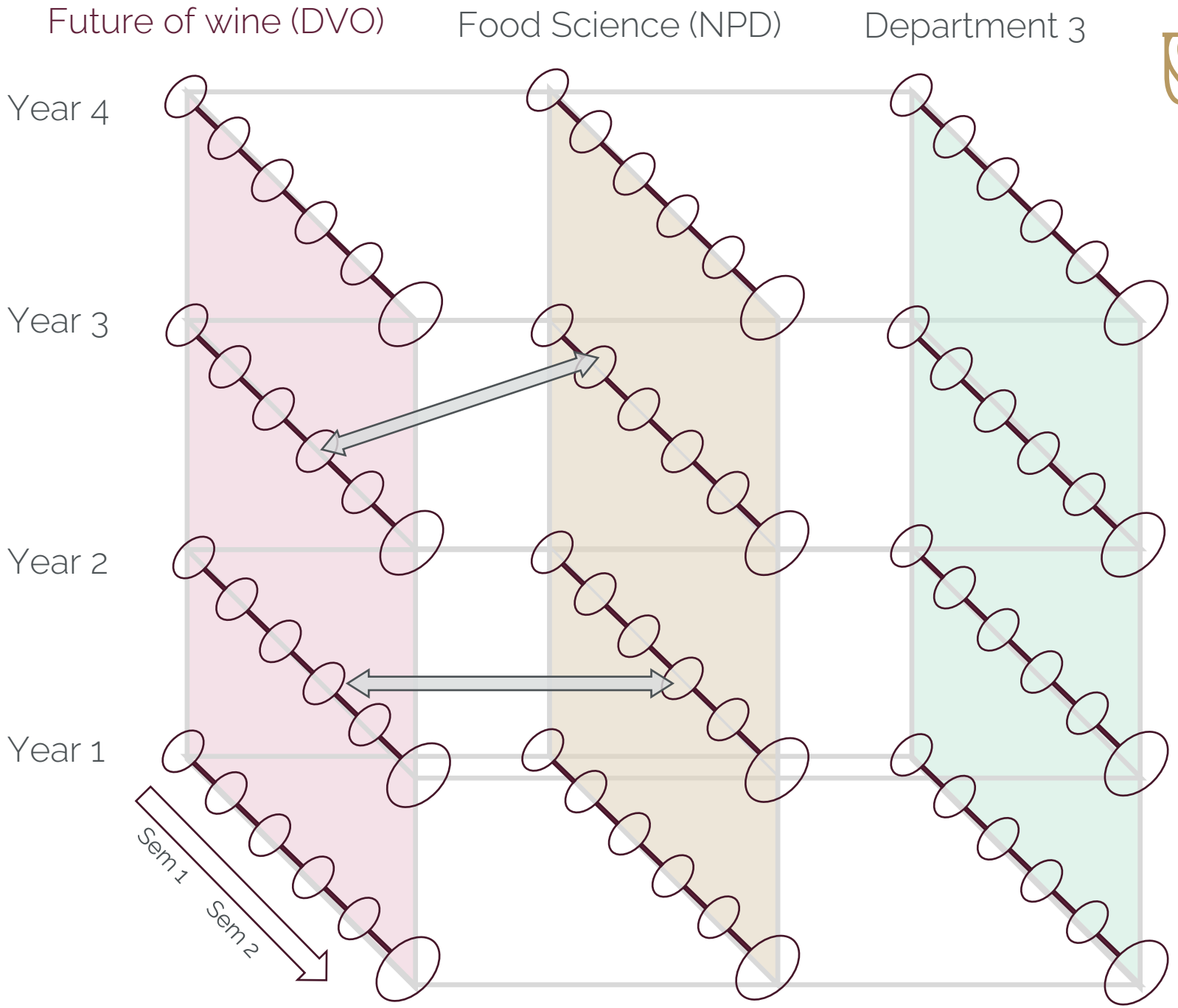
AKA “capstone experience, culminating project” - multifaceted assignment that serves as a culminating academic and intellectual experience for students (edglossary.org)

Note: First-year we only make students aware of entrepreneurial support systems – allow transition and adaptation first



Stellenbosch
UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

forward together
sonke siya phambili
saam vorentoe



Stellenbosch
UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

forward together
sonke siya phambili
saam vorentoe

2023 changes (capstone project) (Viti+Oenol)

GWS 278

- Ideation (individual)
- Basic principles of entrepreneurship and related skills and formulating an industry-related individual idea/innovation
- Using AI tools in business idea evaluation

GWS 378

-Groupwork – “company” formation

-Entrepreneurial principles: industry-related idea filtering

-Lean canvas and product/service prototype/specification development

Industry internship

- Idea customer discovery
- Questions/survey
- Further work on choosing a single idea at the end of the internship (winter school)

GWS 454

- Innovation, emerging tech & entrepreneurship in the context of a changing industry and world
- Finalising pitch deck and portfolio

Individual portfolio/pitch/video

Group pitch/portfolio (2 ideas)

Feedback and choice of 1 idea

Final pitch/showcase

Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT
forward together
sonke siya phambili
saam vorentoe

Industrial engineering RA

MEM 2022/2023

Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

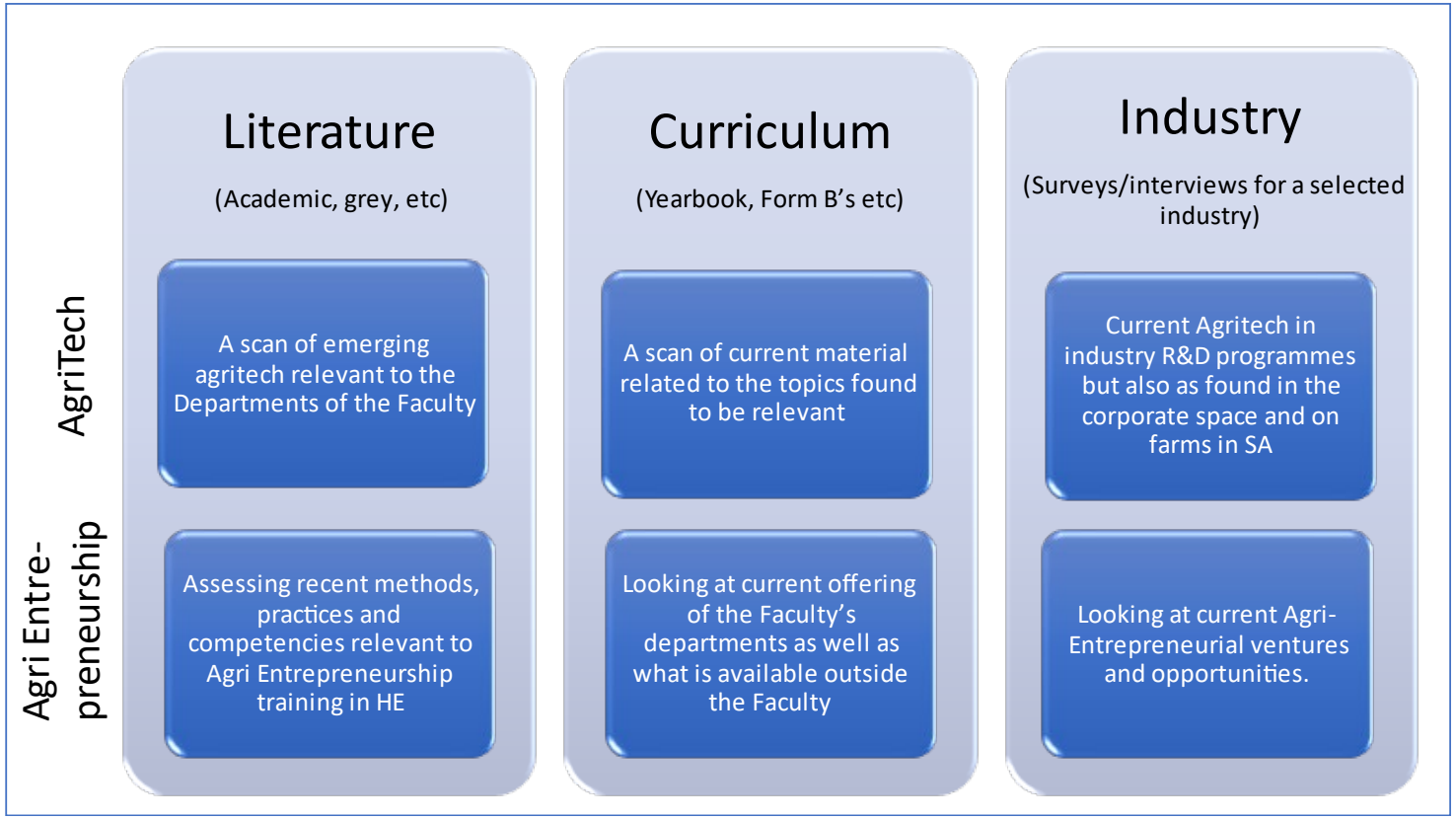
MASTERS DEGREE IN ENGINEERING MANAGEMENT

Topic: “An engineering management view on the future agricultural sciences student and lecturer: entrepreneurship and emerging agritech integration”

MEM 2022-2023

Possibly topic modelling and LLM creation from different sources

Survey with academics/industry on competencies/agritech scripted tool created



Conclusions

- Scholarly outputs on entrepreneurship in Agriculture in a non-EMS non-business school world (?)
- Engineering management view and systematic/scoping processes + text mining offers interesting opportunities
- In a few years (perhaps already), students will be ahead of us in terms of entrepreneurship, use of AI tools.
- We need to adapt in HE to offer students a smoother transition to the workplace and ensure that they make a meaningful contribution to the economy/world of work.

Acknowledgements

- TAU fellowship
- UCDG/AgriSciences funding
- Prof Maret du Toit/Prof Kennedy Dzama
- Anneke Muller
- Maricel Krugel (Food Science NPD), Marianne Bester (APQA), Karen Catell-Holden (CTL)
- Gretha Steenkamp (Accounting), Lelani Maree (Business Management), Angus Bowmaker-Falconer (USB)

thank you | enkosi | dankie

References:

- Chan, Cecilia K. Y., Emily T. Y. Fong, Lillian Y. Y. Luk, and Robbie Ho. “A Review of Literature on Challenges in the Development and Implementation of Generic Competencies in Higher Education Curriculum.” International Journal of Educational Development 57 (November 1, 2017): 1–10. https://doi.org/10.1016/j.ijedudev.2017.08.010
- Fitz-Koch, S., Nordqvist, M., Carter, S., & Hunter, E. (2018). “Entrepreneurship in the Agricultural Sector: A Literature Review and Future Research Opportunities. Entrepreneurship Theory and Practice”, 42(1), 129–166. https://doi.org/10.1177/1042258717732958
- IFR – “Futures of Agricultural Employment in South Africa: 2035”, 2022, Institute of Futures Research, Stellenbosch Business School, accessed May 2023.
- Nieuwoudt, Simone, Johannes IF Henning, and Henry Jordaan. “Entrepreneurial Competencies and Financial Performance of Farmers in South Africa.” *South African Journal of Economic and Management Sciences* 20, no. 1 (2017): 1–13.
- Pontefract, Dan. “It’s About Time We Abandoned The Term’ Soft Skills’.” Forbes, 2023. https://www.forbes.com/sites/danpontefract/2023/03/27/its-about-time-we-abandoned-the-term-soft-skills/.
- Tonderai, Magaya. “What’s The Difference Between Skills and Competencies?,” 2022. https://www.linkedin.com/pulse/whats-difference-between-skills-competencies-tonderai-giftrice-magaya/.
- Wong et al 2022 “A Systematic Review on the Learning Outcomes in Entrepreneurship Education within Higher Education Settings.” Assessment & Evaluation in Higher Education 47, no. 8 (November 17, 2022): 1213–30. https://doi.org/10.1080/02602938.2021.2021583 .