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CAREER DECISION-MAKING LEARNING ACTIVITIES IN STEM: AN INTEGRATED CAPSULE MODEL EARMARKED FOR HIGHER AND VET EDUCATIONS

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SUMMARY

1. **P3 TO P6** : VUCA CONTEXT AND DIFFICULTIES FOR STUDENTS TO MAKE CAREER DECISION : SEVERAL DIMENSIONS AND FACTORS OF DECISION.
2. **P7 TO P10** : THE INTEGRATED CAPSULE MODEL IN 3YEARS.
3. **P11 & 12** : LEARNING OUTCOMES, DECISION SKILLS AND FORMATIVE EVALUATION.
4. **P 13** : STRENGTHS.
5. **P 14** : AREAS OF IMPROVEMENT.
6. **P15** : DISCUSSION.
7. **P16** : INSIGHTS.
8. **P17 & P18** : CONCLUSION & REFERENCES



VUCA CONTEXT AND CAREER DECISION MAKING



- **The world is complex, with a multiplex of forces and no cause-and-effect chain**
 - for future engineers: being prepared to make decisions in Volatile Uncertain Complex Ambiguous environments is important for them throughout life (**career, re-orientation, employability**).



- **VUCA conditions strongly affect the decision capacity**
 - understand VUCA characteristics and sources, their effects on Decision Making processes (**management situation, crisis, change, etc**).

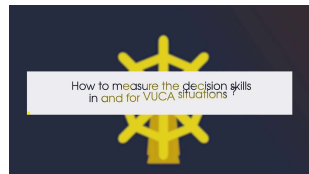
	complexity	volatility
+	<p>Characteristics: The situation has many interconnected parts and variables. Some information is available or can be predicted, but the volume or nature of it can be overwhelming to process.</p> <p>Example: You are doing business in many countries, all with unique regulatory environments, tariffs, and cultural values.</p> <p>Approach: Restructure, bring on or develop specialists, and build up resources adequate to address the complexity.</p>	<p>Characteristics: The challenge is unexpected or unstable and may be of unknown duration, but it's not necessarily hard to understand; knowledge about it is often available.</p> <p>Example: Prices fluctuate after a natural disaster takes a supplier off-line.</p> <p>Approach: Build in slack and devote resources to preparedness—for instance, stockpile inventory or overbuy talent. These steps are typically expensive; your investment should match the risk.</p>
+	<p>Characteristics: Causal relationships are completely unclear. No precedents exist; you face "unknown unknowns."</p> <p>Example: You decide to move into immature or emerging markets or to launch products outside your core competencies.</p> <p>Approach: Experiment. Understanding cause and effect requires generating hypotheses and testing them. Design your experiments so that lessons learned can be broadly applied.</p>	<p>Characteristics: Despite a lack of other information, the event's basic cause and effect are known. Change is possible but not a given.</p> <p>Example: A competitor's pending product launch muddles the future of the business and the market.</p> <p>Approach: Invest in information—collect, interpret, and share it. This works best in conjunction with structural changes, such as adding information analysis networks, that can reduce ongoing uncertainty.</p>
-		

- **Reliability depends on the ability of the actors**
 - to anticipate and cope with unexpected situations

By Nathan Benett & G. James Lemoine

... the Right Decisions at the Right Times !

LEARNING OUTCOMES FOR DECISION MAKING



Decision making skills : Inspired by the CDIO syllabus (Crawley et al., 2011) and the ENAEE requirements for graduate engineering profiles (ENAEE, 2017).

D1 Recognise and qualify the VUCAity of a family of situations

D2 Analyse VUCA situations

D3 Make a judgement in VUCA situations

D4 Face complexity of VUCA situations

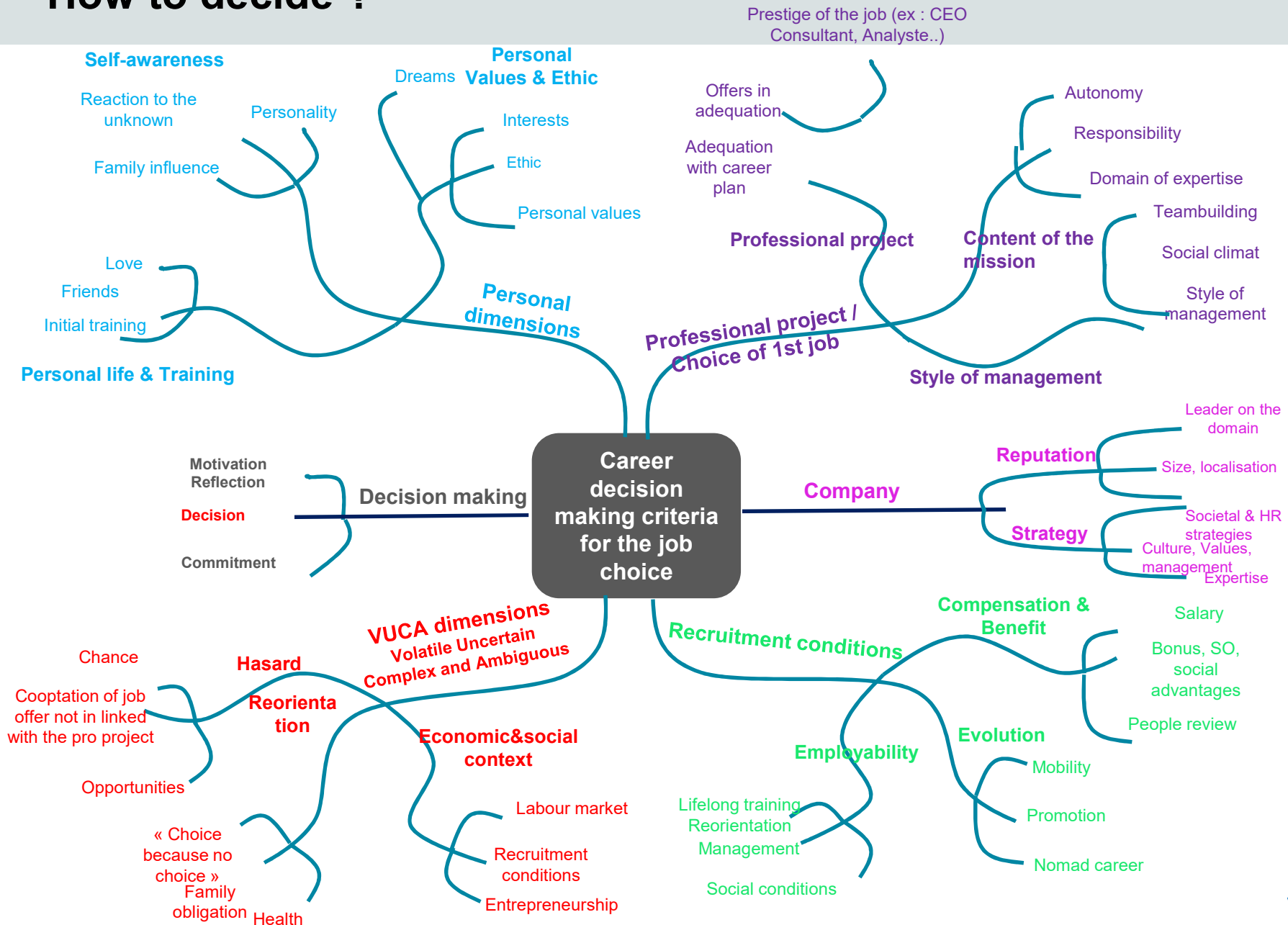
D5 Organise and implement actions in VUCA situations

D6 Take responsibilities in the decision process in VUCA situations

D7 Learn from his/her experience of VUCA situations



Employability after graduation depends on many factors. How to decide ?



APPROACH WITH RATIONAL AND EMOTIONAL INTELLIGENCE

CAREER SKILLS

Ability to:

Understand the situation

Identify external factors

Make decisions with uncertainty

Use critical thinking skills

Assess the level of risks and success factors

Manage priorities and focus points

Adapt to the situation

TO EMBRACE
CAREER DECISION
MAKING IN STEM
EDUCATION



This course, in the form of **a continuum over three years** with a marketing approach, brings student maturity, greater decision-making abilities in volatile, uncertain, complex and ambiguous contexts and reinforce transversal skills.

Yourself : 'Know yourself to make choice aligned with your aspirations'.

Self-awareness of DOTS Model (by Law & Watts 1977, 1996).

Open-minded : 'be open to opportunities' and develop your skills and professional networking.

Up to you : 'to become an actor' in your employability throughout life.

This conceptual proposal may assist academic leaders and flexible curriculum designers by identifying learning areas and capsule-like learning activities, as a transferable result in their context.

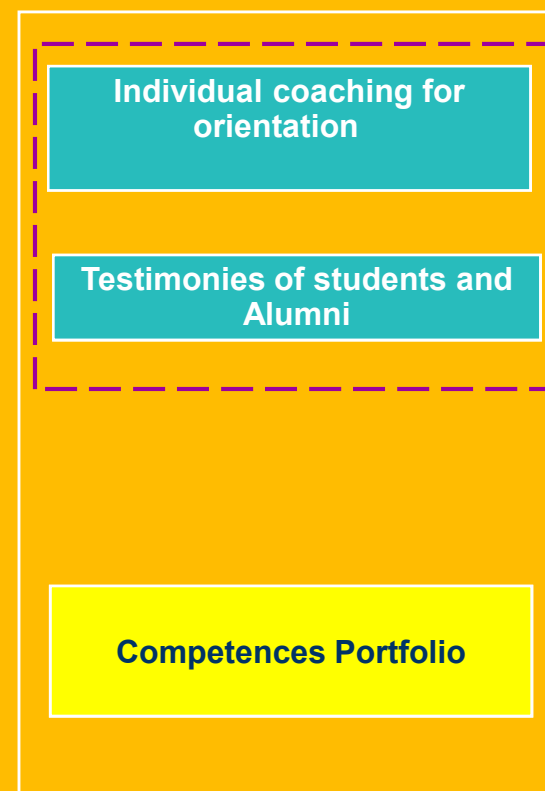


YOU : Yourself / YEAR 1

Mandatory workshops (20H)



Optional workshops (10H)



Mandatory this year



Only this year



Personal development



Optional



YOU : Openminded / YEAR 2

Mandatory workshops (20H)



Optional workshops (10H)



Mandatory this year



Only this year



Personal development

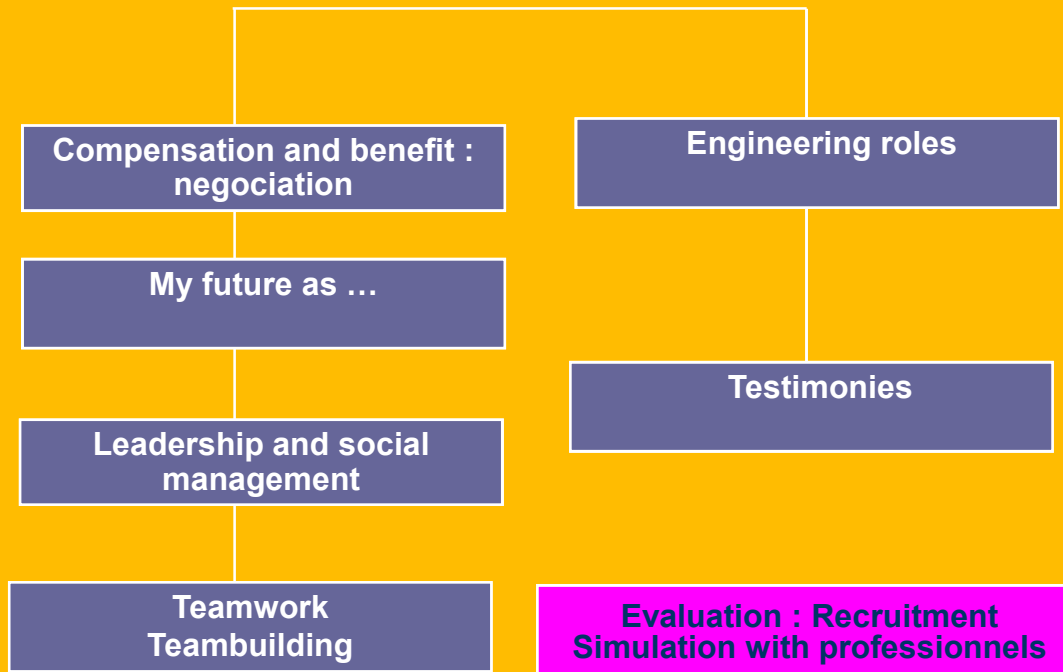


Optional



YOU : Up to you / YEAR 3

Mandatory workshops (20H)



Optionnal workshops (10H)



Mandatory this year



Only this year



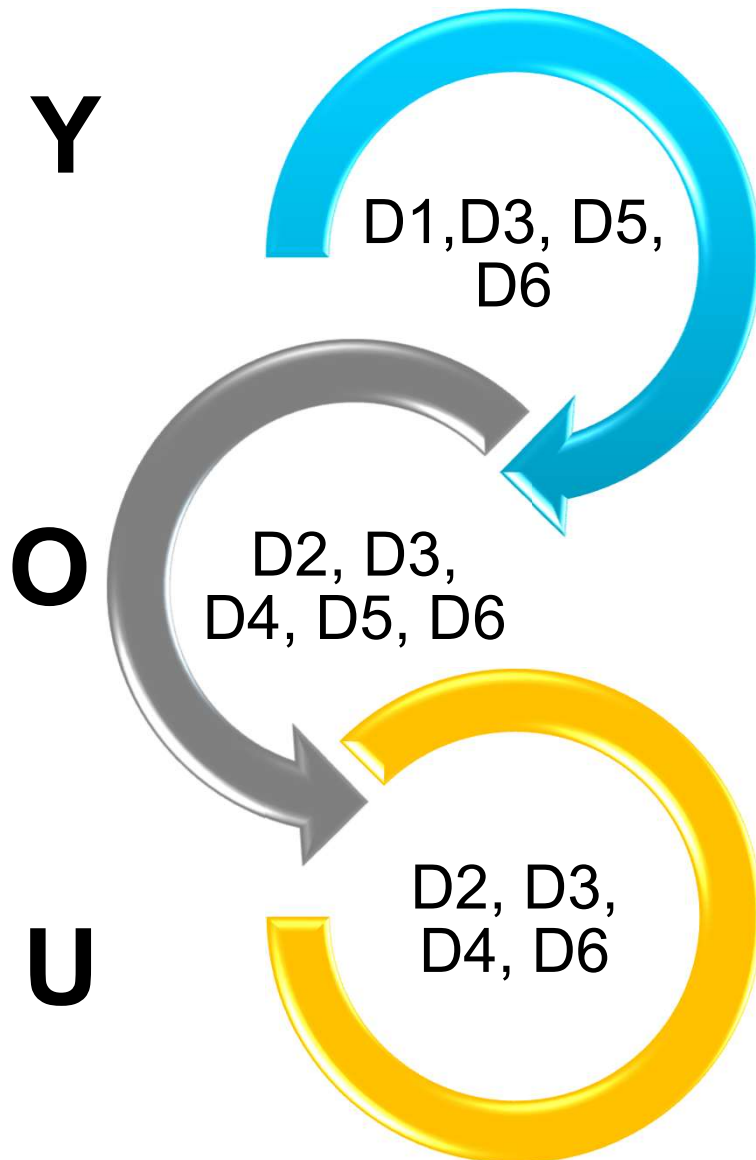
Personnel development



Optionnal

10

CAREER DECISION SKILLS IN THE INTEGRATED CAPSULE MODEL / EACH YEAR



- D1 Recognise and qualify the VUCAity of a family of situations
- D2 Analyse VUCA situations
- D3 Make a judgement in VUCA situations
- D4 Face complexity of VUCA situations
- D5 Organise and implement actions in VUCA situations
- D6 Take responsibilities in the decision process in VUCA situations
- D7 Learn from his/her experience of VUCA situations



FORMATIVE EVALUATIONS WITH VUCA LEVELS

To evaluate the learning outcome results and student reflective analysis

No concerned	Low level	Medium level	High level
V	Green	Orange	Red
U	Green	Orange	Red
C	Green	Orange	Red
A	Green	Orange	Red

DAhoy – Career Decision Making
YOU Evaluations

YOU – Formative Evaluations – 3 years cursus

Good decision at the right time ! a ready-to-go career decision courses training

STUDENT :

PROFESSOR :

YOU – 1 st Year – Evaluation 'Pitch to introduce myself'										
Instropection, Self-awareness and Resume level1										
CRITERIAS	Student self evaluation	Professor evaluation	++ A Very good/Good	+ B Can do better !	+ C Insufficient work	D At work !				
							YOU – 2 nd Year – Evaluation 'Pitch to introduce my professional project'			
							Networking, Professional projet Pitch and Resume level2			
E-identity	Resume		<i>A relevant and attractive CV for the recruiter, in terms of content and form. It brings a real singularity which can trigger an interview. Photo not required.</i> 1 - Form One page (good length). The objective is present. Design is attractive to the recruiter. Balanced CV at paragraph level. The "bold" underlines the keywords and not just the titles. Photo is professional. (adapted dress, smile).	<i>An interesting CV. It is w could generate an inter, there are still improvem made. Photo not require</i> 1 – Form One page (good lengt Objective present. Classic design; sober ; The paragraphs are re balanced. Details are No enhancement of k Professional photo ad						
			2 - Substance The title of the CV clearly indicates the objective aimed by the student or his assets. The projects are detailed (3/4 description lines). The student's contribution to the project or internship is indicated; skills are valued.	2 - Substance Title of the targeted C The formulations of th experiments are gene Personal contribution not highlighted.						
							YOU – 3 rd Year – Evaluation 'Simulation recruitment'			
							Final decision, Individual action Plan with SMART objectives and Resume level3			
CRITERIAS	Student self evaluation	Professor evaluation	++ A Very good/Good	+ B Can do bett	++ A Very good/Good	+ B Can do better !	+ C Insufficient work	D At work !		
SKILLS OF CAREER DECISION MAKING V : Volatility average because the variation of factors is partially known because internships and projects are professional experiences. U : Uncertainly low because simulation interviews with real professional managers are organized and the process of internship recruitment interview is experimented. C : Complexity average because the professional tools are ready in adequation with the professional project which is more mature. A : Ambiguity average because there is no obvious interpretation about the choice of the first job or a favorite scenario of career. Level scale of variability (Low, Average, High) => Year 3 : V (Average), U (Low), C (Average), A (Average)										
After the 3rd Year, Dskills of the students : D1: Recognize and qualify a situation : ability to observe with insight, identify situational criticality, understand factors, remove "noises" to synchronize with the Situation like no motivation to choice a career orientation. D2: Analyze a situation and make a conscious judgment : think globally, define priorities and focus points, analyze points of uncertainty, be critical, identify risk factors, especially those of the situation, identify the keys to success. D3: Use or infer a decision model : manage priorities and identify focus points, evaluate, seek optimal solutions to integrate a job after the end of the training. D4: React and decide in action : to face dynamics and VUCAlity : a sense of initiative and make decisions in a VUCA context, interact and synchronize with the stakeholders in the situation like recruitment managers, dare with courage to find a good job. D5: Take responsibility for decision-making and learn : a sense of urgency, be adaptable. D6 : Take responsibilities in the decision process in recruitment, face to face management, negotiation, choice situations D7 : Learn from his/her experience of VUCA situations										
Co-evaluation of the Year 3 (Student and Teacher) : Improvement comments : List of capacity or difficulty to take decision for the career : Solving methods to make career guidance :										
					<i>The portfolio brings elements of differentiation and proofs of skills on at least 3 engineering projects and a personal project.</i> The portfolio is available on the linked in or interactive page with the CV. At least 3 experiences (projects, internships, association life ...) are described and highlight the scientific, societal, transversal and personal skills developed.	<i>The portfolio provides proof of skills on only one engineering project.</i> The portfolio is present and formalized. It reflects at least one experience (project, internship, association life, etc.) and highlights the scientific, societal, transversal and / or personal skills developed.	<i>The portfolio is being produced in an advanced manner.</i> The formalization of a portfolio has been initiated on a medium of the student's choice. The portfolio is not present either on the CV or on the linkedin page. The start of skills development is underway.	<i>The portfolio is nonexistent.</i> The formalization of a portfolio has not been initiated.		
					<i>The resume is updated, improved with links with linkedin, with portfolio, blog or other.</i>	<i>The resume is updated, improved and hypertext links exist with linkedin.</i>	<i>The resume is updated and improved.</i>	<i>No improvement</i>		
					<i>The two professionals agreed to recruit after the simulation and make a real proposal of job after the cursus.</i>	<i>The two professionals agreed to recruit.</i>	<i>One of the professional was agreed to recruit the student.</i>	<i>No success for the recruitment with the two professionals.</i>		
					<i>Individual plan actions made with final decision, SMART objectifs and beginning of tasks.</i>	<i>Individual plan actions made with final decision.</i>	<i>Beginning of plan actions but it's not finalized with decision making.</i>	<i>No individual plan action because no decision about career.</i>		

AREAS OF IMPROVEMENT

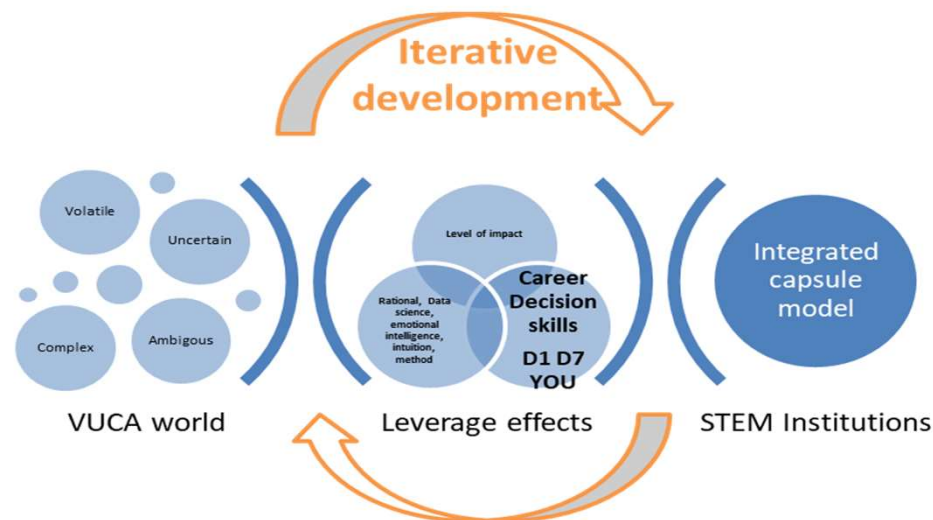


- ▶ A weakness when the student registers at FUEIB: some students don't necessarily attend the session because they are not obliged to participate. **Absenteeism is an issue therefore** and is a cost to the career centre. **Sometimes the students don't register but they come to class.** Then the organization becomes difficult.
- ▶ Student **discovery of the « VUCA world »** is done via the conferences. It is important to develop students' awareness and agility towards the volatility, uncertainty, complexity and ambiguity of the international market.
- ▶ **Intrinsic and extrinsic motivation: students volunteer for an integrated capsule model.** This commitment guarantees involvement. Research studies show that these modalities of motivational dynamics have an impact on learning and on deciding.
- ▶ An intermediate assessment is to be made early to enhance the cross-cutting skills acquired. Ideally at the end of the course, an oral exchange on the skills acquired is done with the guidance counsellor. **A synthesis is written in a lifelong passport or portfolio for formal recognition of learning.**

DISCUSSION



- A comparison between 3 universities shows that it's better to register and workshops in a compulsory way in the curriculum of the students. The model is a **mix of compulsory and optional workshops** to make the student responsible for his training. Good idea or not ?
- **Iterative development of the model.** This method presented as a lifelong process of reflection, to discover their uniqueness as well as a managerial attitude based on mutual help and respect. Right ?
- These courses develop **transversal skills** (leadership, self-confidence, posture, communication, personal branding marketing).
- A student who is not motivated by the method still manages to find a career project?



INSIGHTS



For universities at educational program level, it is important that they include professional training sessions with standardised practices related to employability. **The method can be quickly integrated as a ready-to-go toolkit in career training courses** of any university.

The DAhoy **career decision skills** are used to build the programme on decision-making. The likelihood of realising expressed ideals in the first job may be more objectively questioned, or analysed quantitatively and qualitatively, when bringing in industry and former students as proposed in this model.

CONCLUSION

The integrated capsule model can facilitate decision-making with regard to professional mobility, throughout careers that will be subject to the vagaries of a volatile, uncertain, complex and ambiguous international market. The method can thus be quickly integrated as a ready-to-go toolkit in career training courses, to allow any university to use it.

The skills acquired allow evolution towards the status of managerial engineer or entrepreneur for the participants who develop their leadership and management soft skills.



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