Self-regulated learning and its scope setting using 21st-century competency framework and AI techniques

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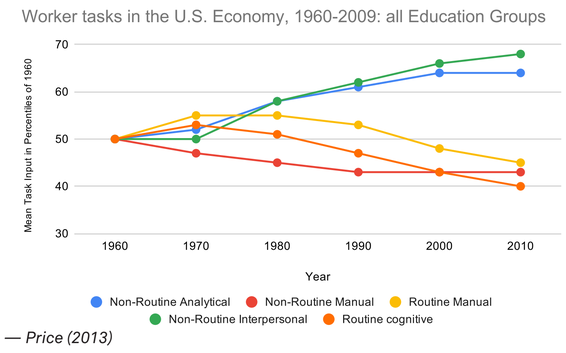
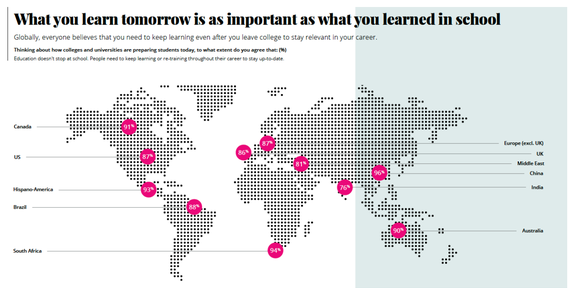
Motivation



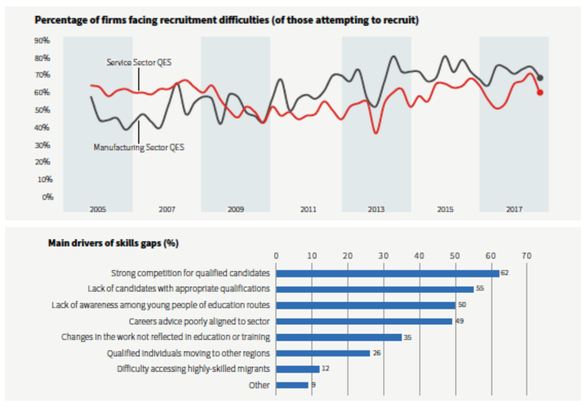
— Price (2013)

Taking into account adult education, firstly analysing work-life scenario, our workplace is being completely transformed by the constant emergence of new technologies. An analysis between 1960 and 2009, in the USA, about work tasks, as we can see in Figure 1, tasks considered as manual or routine are in constant decline, on the other hand, tasks as non-routine, analytical and interpersonal are increasing considerably (Price, 2013).

Several reports in the job and educational arena are being produced to foment the discussion about reskilling and upskilling needs. For example, in the World Economic Forum (WEF, 2019), a global survey about skills gap shows that the main concern of CEOs (78% of them) is about the availability of skills. Those CEOs (46%) believe that the main strategy to close the skills gap is by reskilling and upskilling employees. Another recent global report from Pearson and PWC (Pearson, 2019) shows that 78% of people think that they need to develop soft skills, such as critical thinking, problem solving and creativity. Among those that said they need to upskill, 20% believe they need to do it because of automation and artificial intelligence.



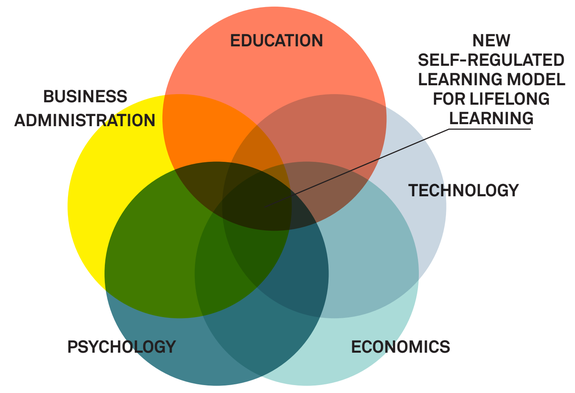
— Pearson (2019)



— Edge Foundation (2018)

60% of the service sector in the UK are facing trouble to find candidates with the proper skill set for the position, and 62% of the companies report strong competition for qualified candidates. (Edge Foundation, 2018) According to the Person's survey, people believe they need to keep learning or re-training throughout their career to stay up-to-date (96% in China, 91% in Canada, 93% in Hispano America and 94% in South Africa). **The fact is the exponential technological revolution changing professions and workplace, and as a consequence skills gap emerged**.

To address the problem, firstly we define as the study's nyche these fields below:



RESEARCH QUESTION

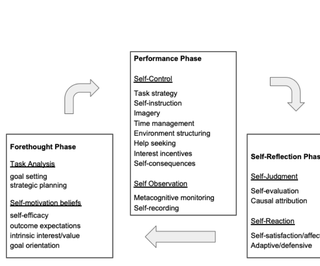
How can a digital platform enhance self-regulated learning to professionals, in the context of startup jobs, to help them reskill and upskill more efficiently?

Aims

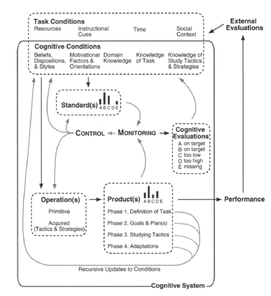
→ Adapt the SRL model for further education in the context of startup jobs based on the review of SRL models below.

→ Introduce the concept of scope setting in the self-regulated learning model.

→ Create through participatory design (Woolner, Clark, 2015) a digital platform to test the model.



— Zimmerman (2009)



— Winne and Hadwin (1998)

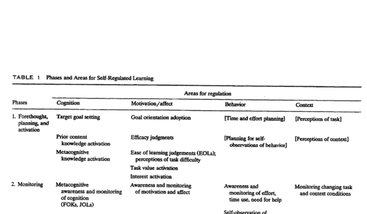
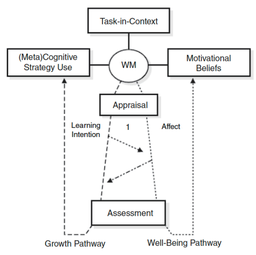


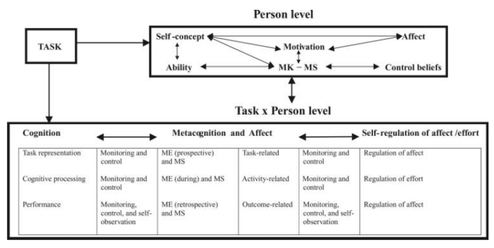
TABLE 1 Phases and Areas for Self-Regulated Learning

Phases	Areas for regulation: Cognition	Motivation/affect	Behavior	Context
1. Forethought, planning, and activation	Target goal setting	Goal orientation adoption	[Time and effort planning]	[Perceptions of task]
	Prior content knowledge activation	Efficacy judgments	[Planning for self-observation of behavior]	[Perceptions of context]
	Metacognitive knowledge activation	Ease of learning judgments (EOLs); perceptions of task difficulty		
		Task value activation		
		Interest activation		
2. Monitoring	Metacognitive awareness and monitoring of cognition (POKs, JOLs)	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for help	Monitoring changing task and context conditions
			Self-observation of behavior	
3. Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing motivation and affect	Increase/decrease effort	Change or renegotiate task
			Persist, give up	Change or leave context
			Help-seeking behavior	
4. Reaction and reflection	Cognitive judgments	Affective reactions	Choice behavior	Evaluation of task
	Attributions	Attributions		Evaluation of context

— Pintrich (2000)



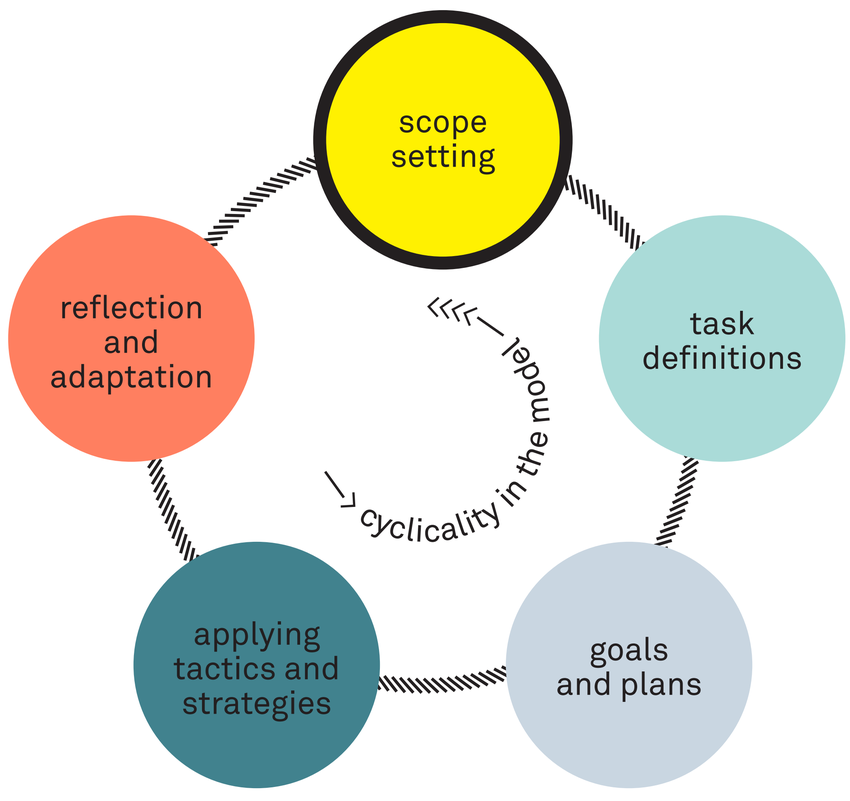
— Boekaerts (2011)



— Efklides (2011)

In those models there is an underlined premise that in children/teenager education a curriculum provides the comprehensive scope of what needs to be learned. A gap was identified in self-regulated learning models as in lifelong learning there is no curriculum or comprehensive scope to guide this kind of continuous education. (Boekaerts, 2017; Greene; Azevedo, 2007, Pintrich, 2000)

Our model is based on the Winne and Hadwin (1998) model because it has been a widely used model, especially in research implementing computer supported learning settings using trace data and learning analytics (Panadero et al., 2015).



Findings so far

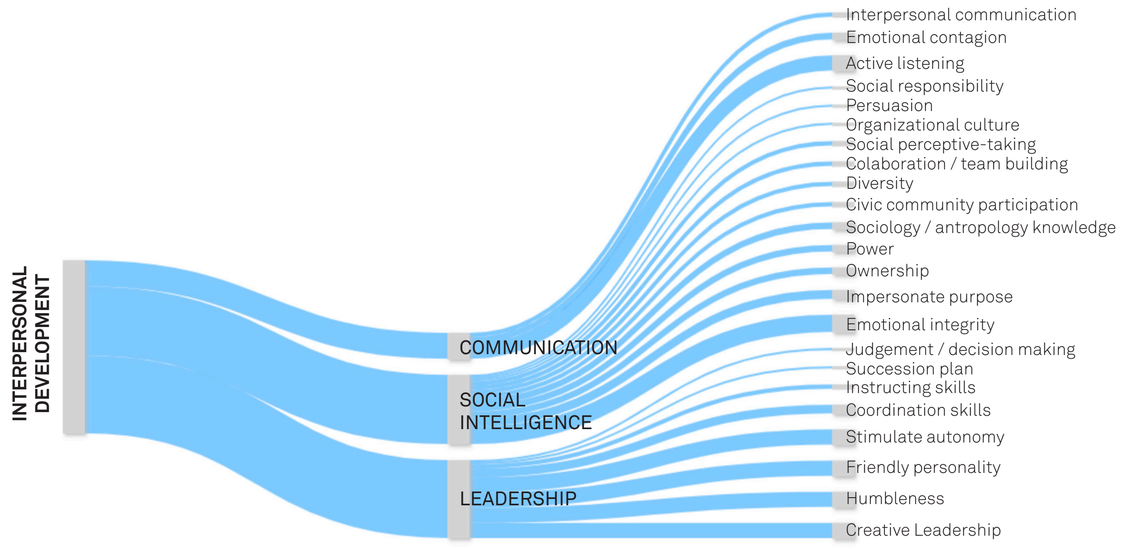
SCOPE SETTING PHASE

Feedback/Interests
Feedback from the workplace (self-feedback, and/or from leaders, employees, peers and any other feedback) or a structured investigation about personal interests will regulate the scope with which a new competence will be developed. (Greene, Azevedo, 2007) A competence matrix framework optionally could be used to help those professionals adequately name and index this competence. To capture those feedback and reflections about personal interests from these various sources, the think aloud protocol (Cukurova et al., 2019) will be used. Artificial intelligence can be applied to analyse emotions, discourse patterns and help users to identify the best competence to be developed.

Competence matrix
Based on a systematic review on competences of the 21st century and applying thematic analysis, a competence matrix was created with 3 hierarchic levels (axes, macro-competences and competencies) and two more layers of complexity (holistic layer and metacognition layer).
My plan here is to relate this interpretation with the Pierce's (Levy, 2007) phenomenological semiotic categories: Firstness, Secondness and Thirdness.

Axes
As the main finding of the thematic analysis (Boyatzis, 1998), in the broadest level of this competency matrix are the developmental axes based essentially in the relationship that drives the relations one have with the world (oneself, others, things). It was found 3 axes: Inner, Interpersonal, Technological developments and one more axis, Holistic development, that can be also understood as a layer above those 3 axes because of its conceptual comprehensive character (UNESCO, 1996; Rychen, Salganik, 2003).

Inner developmental axis approaches the relation of one person with himself/herself. It encompasses competencies like critical thinking, mindfulness and professional attitude. Interpersonal developmental axis reckons the relationship of one person with the people around him. Communication, social intelligence and leadership are the core competencies considered in this axis. Technological developmental axis takes account of the relationship one can have with any piece of technology in his environment. These competencies form this axis: Innovation, Design mindset, Technological interactions (Human-machine interface).



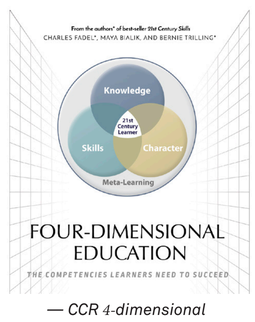
Layers
Holistic developmental is an axis and also a layer, it is responsible for the relationship of oneself with the comprehensive concepts like globalization, environment and is formed by strategic mindset and global mindset competencies. Because of the specific characteristic of this axis/layer, all the other competencies can be applied here. Metacognition is seen in this framework as a layer, an umbrella concept in which all the other competencies are under influences of the "meta" process of thinking about the thinking, learning about learning, having ideas about ideas.

Mastery levels
A scale of mastery levels was proposed to assess the development of each competence based on Zimmerman Multi-level model (2000):

Level 1: There is no evidence that I have developed this skill.
Level 2: I need outside help to exercise this skill.
Level 3: I can demonstrate with evidence that I can exercise this skill without help.
Level 4: I can relate the exercise of this skill with other skills and apply it in different contexts and / or help coworkers.

Models of 21st-century competencies

— P21



— CCR 4-dimensional

— OECD Compass

— UNESCO

Methods

1. Interviews to explore the lifelong learning field in the context of startup jobs
2. Systematic review on SRL models and platforms
3. Systematic reviews on 21st century competencies
4. Scripting/designing the experiment
5. Platform prototype development (digital platform MVP)
6. Intervention: user test
7. Data collection
8. Data analysis (statistical models)

Hypotheses

H1 The construct feedback from the workplace is part of the self-regulated learning model for adult education in the context of startup jobs.

H2 The construct personal Interest is part of the self-regulated learning model for adult education in the context of startup jobs.

H3 A competence matrix is part of the self-regulated learning model for adult education in the context of startup jobs.

H4 Feedback, personal interests and competence matrix are components of an additional phase (scope setting phase) in the SRL model for adult education in the context of startup jobs.

Would you be interested in helping me with my research?

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