

The application of the Functional Resonance Analysis Method (FRAM) to evaluate factors affecting times-to-completion and graduation in graduate studies

Hussein SLIM, Sylvie NADEAU, François MORENCY
École de technologie supérieure, Montréal, Québec, Canada

I. Introduction

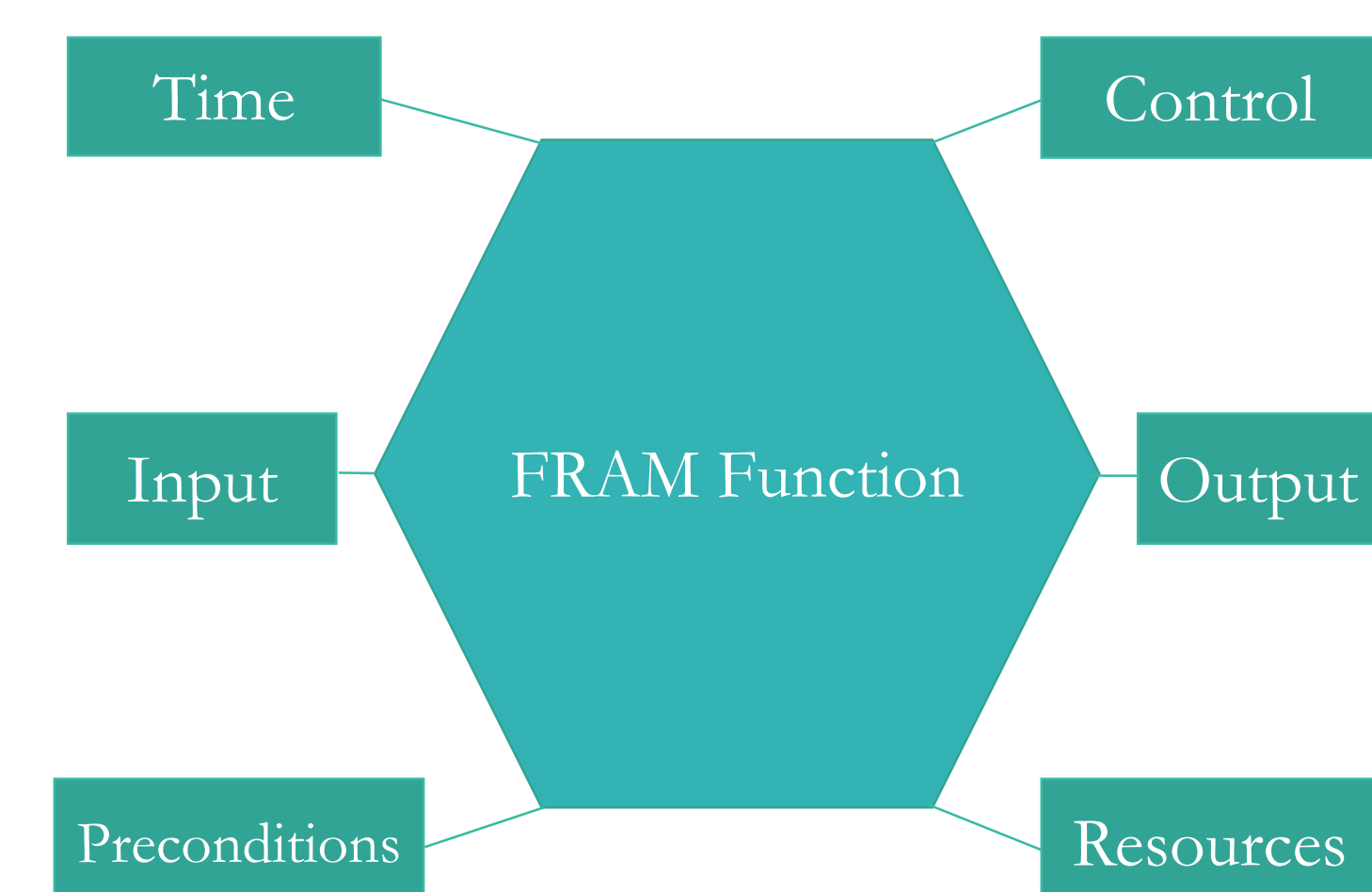
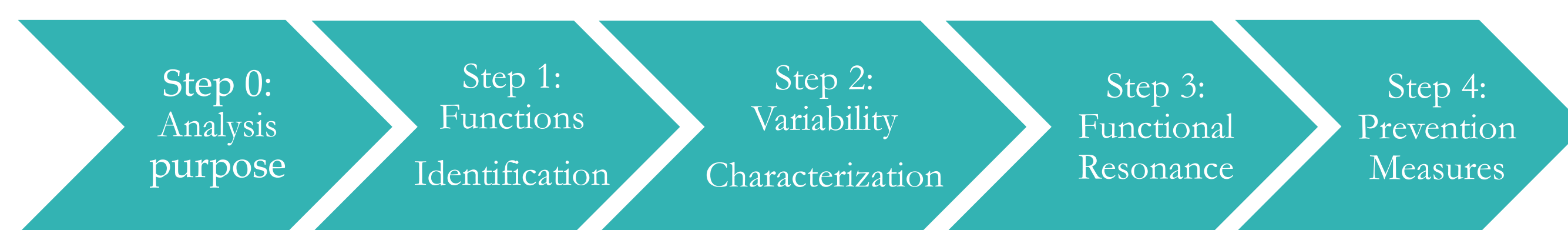
- Over the years, times-to-completion in graduate programs increased in a very alarming way and attrition in higher education has become a global issue present across countries, universities and disciplines.
- The academic, social and economic consequences of attrition on students, educational institutions and governments are substantial.
- Studies fail to agree on what factors are primarily influential due to:
 - Different contexts and settings of the conducted studies
 - Different environments and systems between countries, universities and disciplines.
- To provide a more comprehensive picture, a new approach is required to address the issue from a new perspective.

Objective:

The applicability of the Functional Resonance Analysis Method (FRAM) to determine influential factors affecting graduation rates and times will be demonstrated through an exploratory case study in higher education.

II. Methodology

FRAM is a systemic analysis method that shows how functional variability can combine within the analyzed system to produce adverse outcomes.



Characterization of Variability	
Precision	Imprecise
	Acceptable
Timing	Precise
	Too early
	On time
	Too Late
	Omission

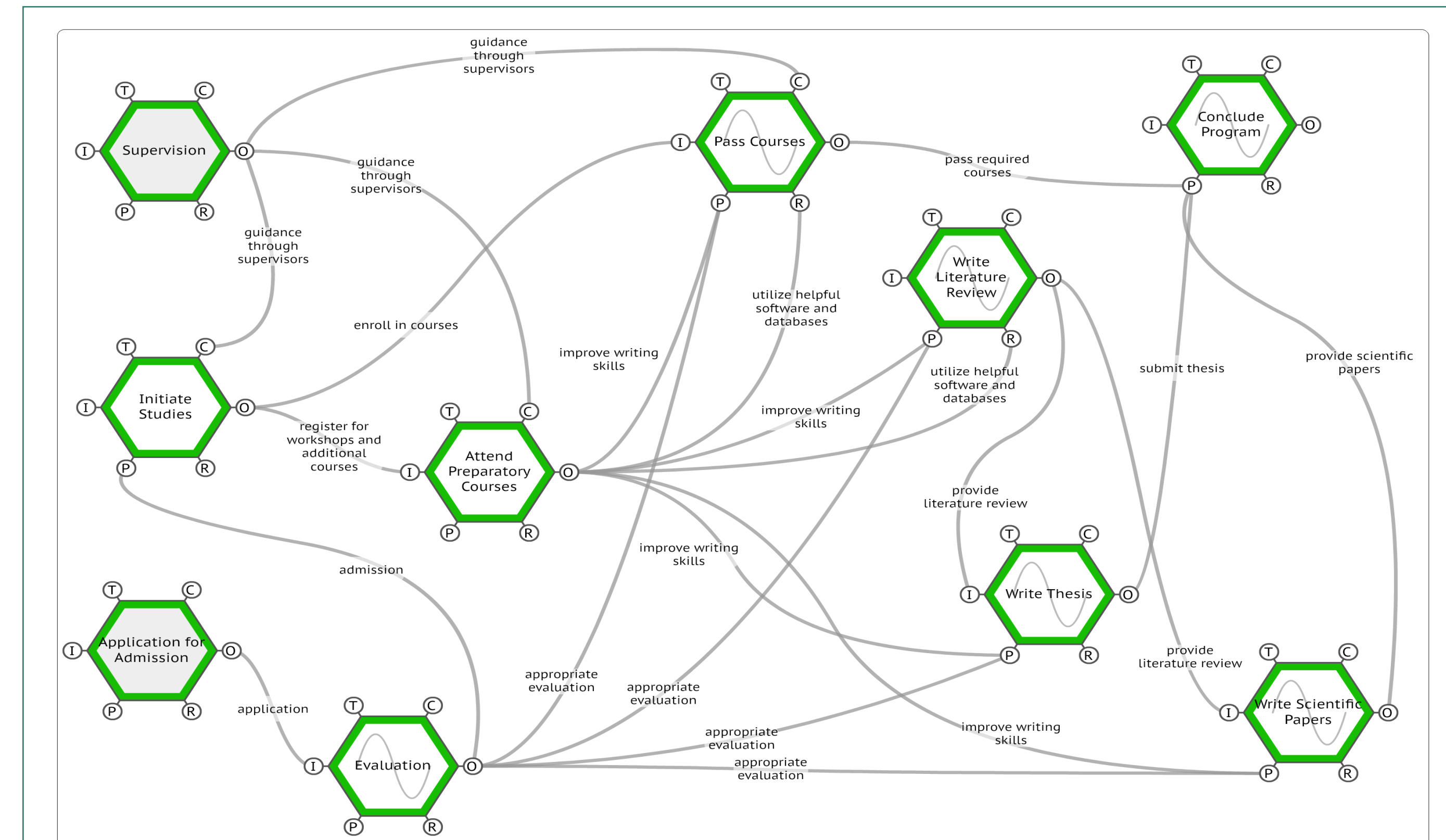
A realistic scenario was constructed to analyze a research-based master's program relying on the expertise of two professors and the guidelines of a medium size Canadian university.

The scenario of the case study:

- A student with inadequate writing skills applies for admission in an engineering program.
- The university evaluates the submitted application using a checklist of requirements.
- The student complies with requirements and submits an acceptable IELTS score.
- The student is admitted and plans the research program with the guidance of the supervisor.
- Tasks: attending a weekly meeting with his/her supervisor, enroll for courses, comply with university requirements, register for workshops and preparatory courses, etc.
- The student in his/her first session enrolls in two courses, which require reading, understanding scientific literature and writing skills.
- The supervisor requires additionally attending preparatory and language courses to improve technical and language skills.

III. Results

No.	Function	Variable Outputs	Variability
1	Provide Procedures & Guidelines		
2	Evaluation	appropriate evaluation	acceptable
3	Supervision		
4	Application for Admission		
5	Preliminary Planning		
6	Provide Resources		
7	Planning		
8	Initiate Studies		
9	Attend Preparatory Courses		
10	Collect Preliminary Data		
11	Provide Research Protocol & Methodology		
12	Pass Courses	pass required courses	too late
13	Compliance with Requirements		
14	Write Literature Review	provide literature review	imprecise
15	Collect Data		
16	Perform Experiments		
17	Analyze Data		
18	Write Scientific Papers	provide scientific papers	too late
19	Write Thesis	provide thesis	too late
20	Submit & Defend Thesis		
21	Conclude Program	No output	



A simplified graphical representation of the FRAM model constructed in the FRAM Model Visualizer (FMV) developed by Rees Hill (<http://functionalresonance.com/FMV/index.html>).

IV. Conclusions

- A graduate program is a complex process, which relies on the interaction of several institutional and individual factors
- The selected case study demonstrated how an inaccurate evaluation of the student's language skills could affect the progress of that student despite his/her compliance with the conditions for admission
- The presented example demonstrates how FRAM can be applied to locate sources of variability within a graduate program.

V. References

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VI. Acknowledgements

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