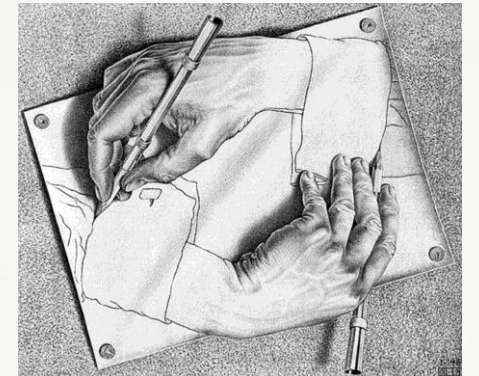


Teaching Sustainable Development and innovation in Engineering Education: Students' perception

Fatma Fourati-Jamoussi, Michel J.F. Dubois & Marie Chedru

Perception can outpace reality

Reality's perception can change reality





1st

Introduction and
Context

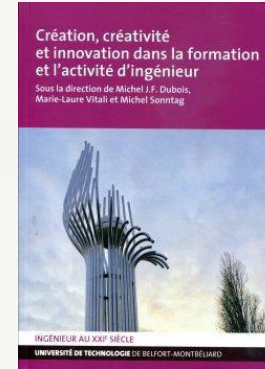
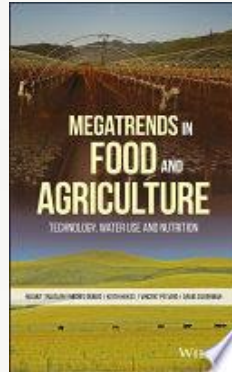
UniLaSalle and three Members of InterACT Research Unit.



**From ISAB to UniLaSalle.
From 600 students to 2800 students.
From one specialty to four specialties.
From one site to three sites.
From zero to 5 masters.**

All curricula are answers to the challenges of Sustainable development

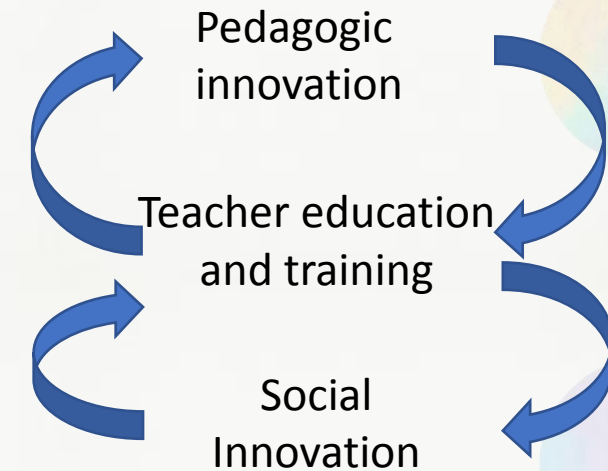
Genesis of our reflection



Sustainable development




Innovation in engineering training
Innovation in engineers' Activities



From sustainable development to innovation in Engineering training

Our contributions

- **Fourati-Jamoussi, F., Agnes M., Caron P., Dubois M.J.F., Leroux V., Rakotonandraina N., Kotbi G., Sauvée L.** 2015. How to promote, support and experiment sustainability in higher education institutions? The case of LaSalle Beauvais in France. *International Journal of Innovation and Sustainable Development*, Vol.9, N°3/4, pp.227-245.
- **Dubois J.F.M. et Fourati-Jamoussi F.** (2017). Intelligence économique et développement durable : réflexion intégrative, *Revue Internationale de l'Intelligence Economique*, Vol. 9, N°1, pp. 77-94.
- **Fourati-Jamoussi, F., Dubois, M. J. F., Agnes, M., Leroux, V., Kotbi, G., Sauvée, L.** (2017). "*Former des élèves ingénieurs au développement durable - Une approche par et pour l'innovation pédagogique à LaSalle Beauvais*". In Dubois M.J.F., Vitali M.L. et Sonntag M. (dir). *Création, créativité et innovation dans la formation et l'activité d'ingénieur*, Edité par l'Université de Technologie de Belfort-Montbéliard, pp. 229-237.
- **Fourati-Jamoussi, F., Dubois, M. J. F., Agnes, M., Leroux, V., Sauvée, L.** (2018a). "Sustainable Development as a driver for educational innovation in engineering school: The case of UniLaSalle". Accepted in *European Journal of Engineering Education*. pp 1-19.
- **Fourati-Jamoussi, F., Dubois, M. J. F., Chedru, M.** (2018b). "Teaching Sustainable Development and innovation in Engineering Education: Students' perception". *Société Européenne pour la formation des ingénieurs*, pp 17-21, September 2018.



2nd

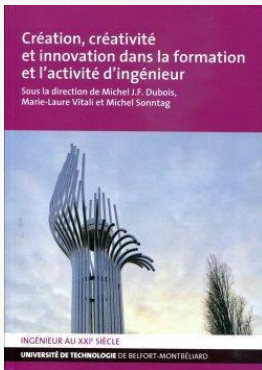
Problematic and
Methodology

What are the students' perceptions about the value of integrating SD and innovation into their curriculum ?

7

Previous study :

- Qualitative methodology (June 2015 – March 2016)
- Case study of UniLaSalle (Beauvais campus)
- 27 semi structured interviews:
 - Management team
 - Curricula management teams

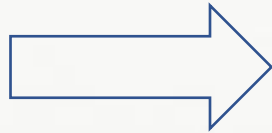


Current study :

- Quantitative study (November, 2017)
- Case study of UniLasalle (Beauvais campus)
- 291 engineering students (in master 1 level) :
 - 144 from *Agriculture* speciality
 - 61 from *Nutrition and Health sciences* speciality
 - 86 from *Geology* speciality

Four theme-based survey

As a
conclusion
of the
previous
studies



- **Reasons for integrating innovation** in the engineering curriculum at UniLaSalle (10 items, on 5-point Likert scale)
- **Reasons for integrating SD** in the engineering curriculum at UniLaSalle (4 items, on 5-point Likert scale)
- **The perceived pillars of sustainable development** (four pillars on 5-point Likert scale; indication of extent of integration in curriculum)
- **The link between SD and innovation** in engineering education (3 Items).

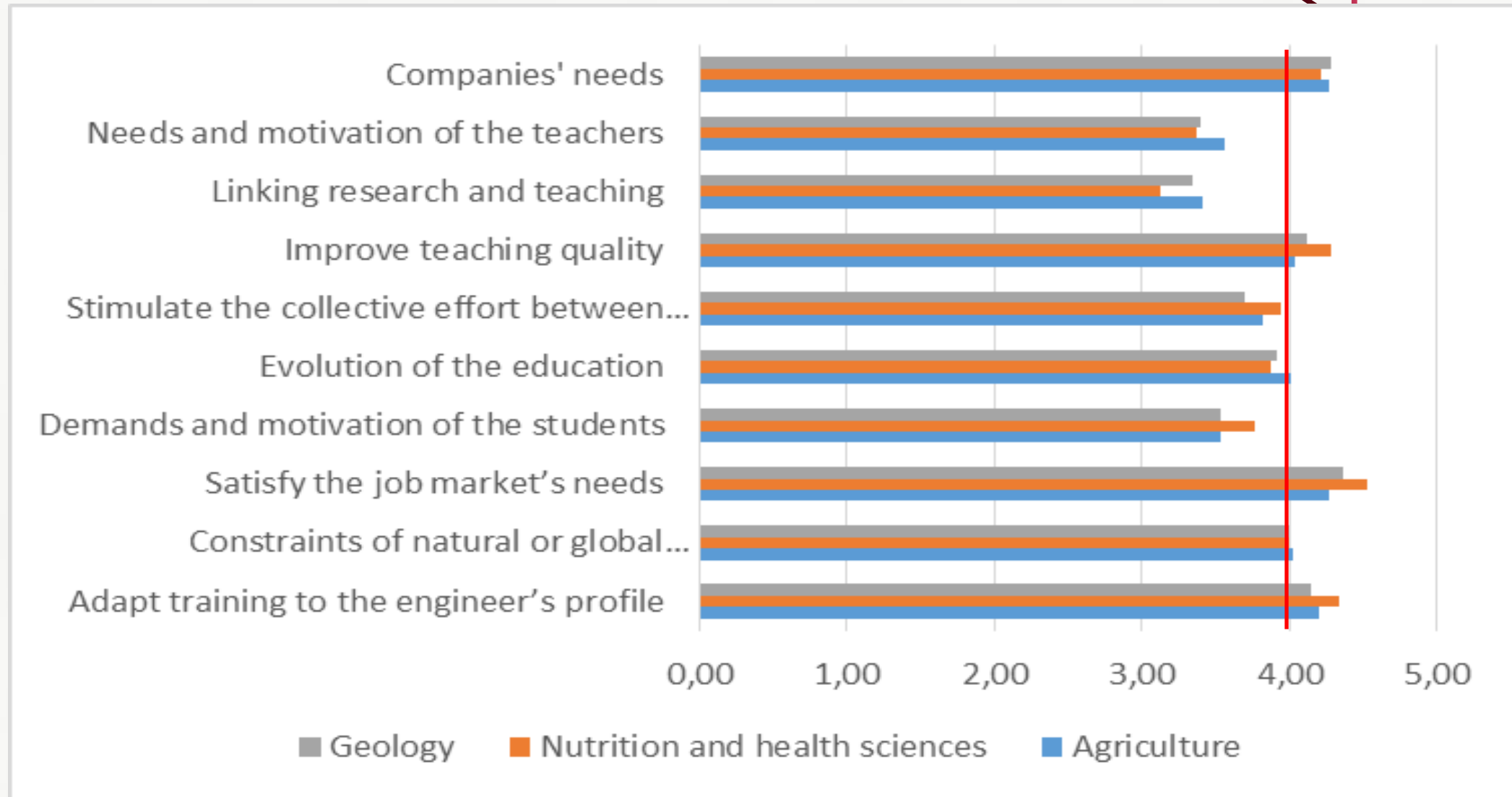


3rd

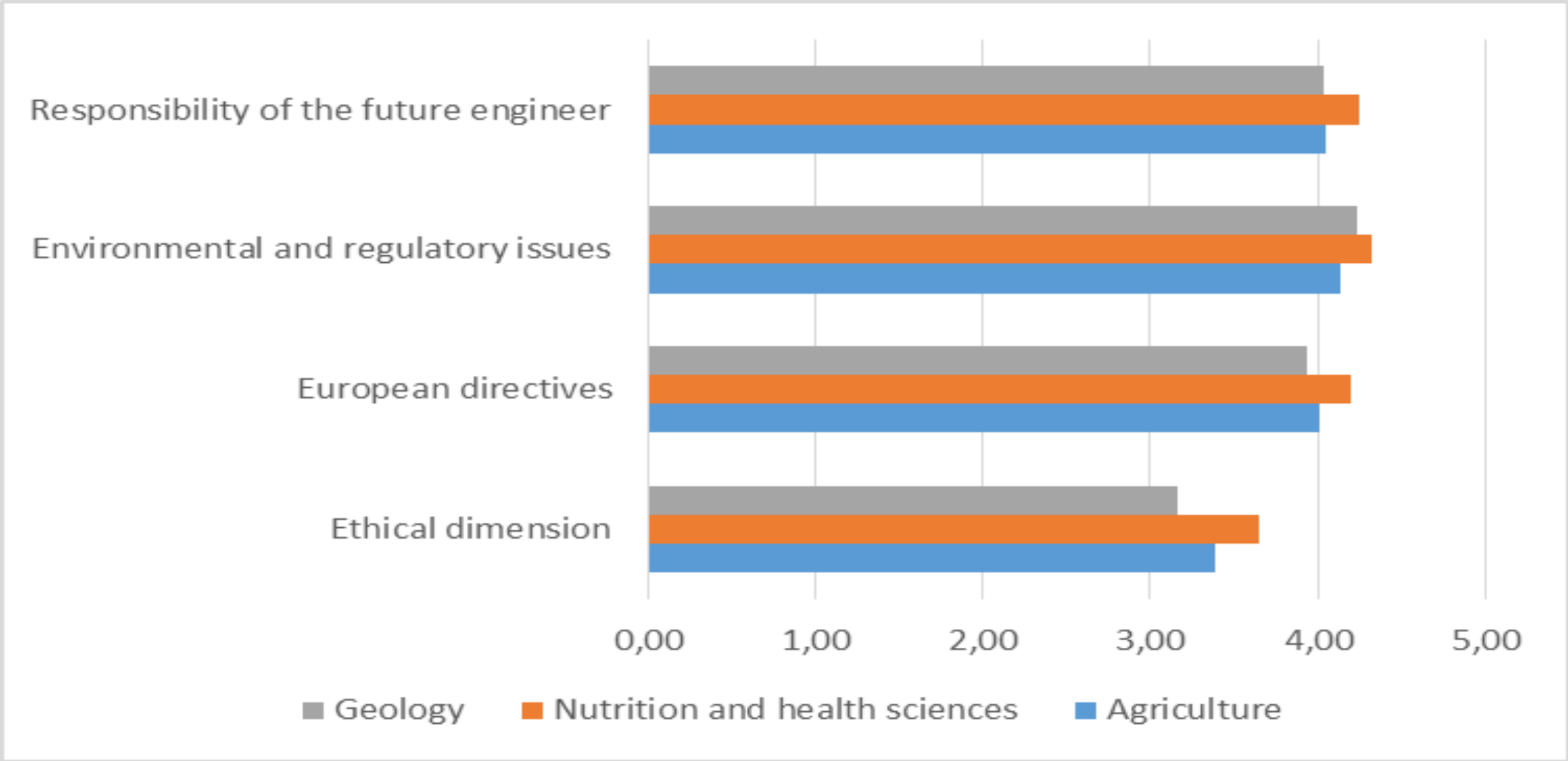
Results

Students' opinion about the reasons for integrating innovation in the engineering curriculum at UniLaSalle.

10



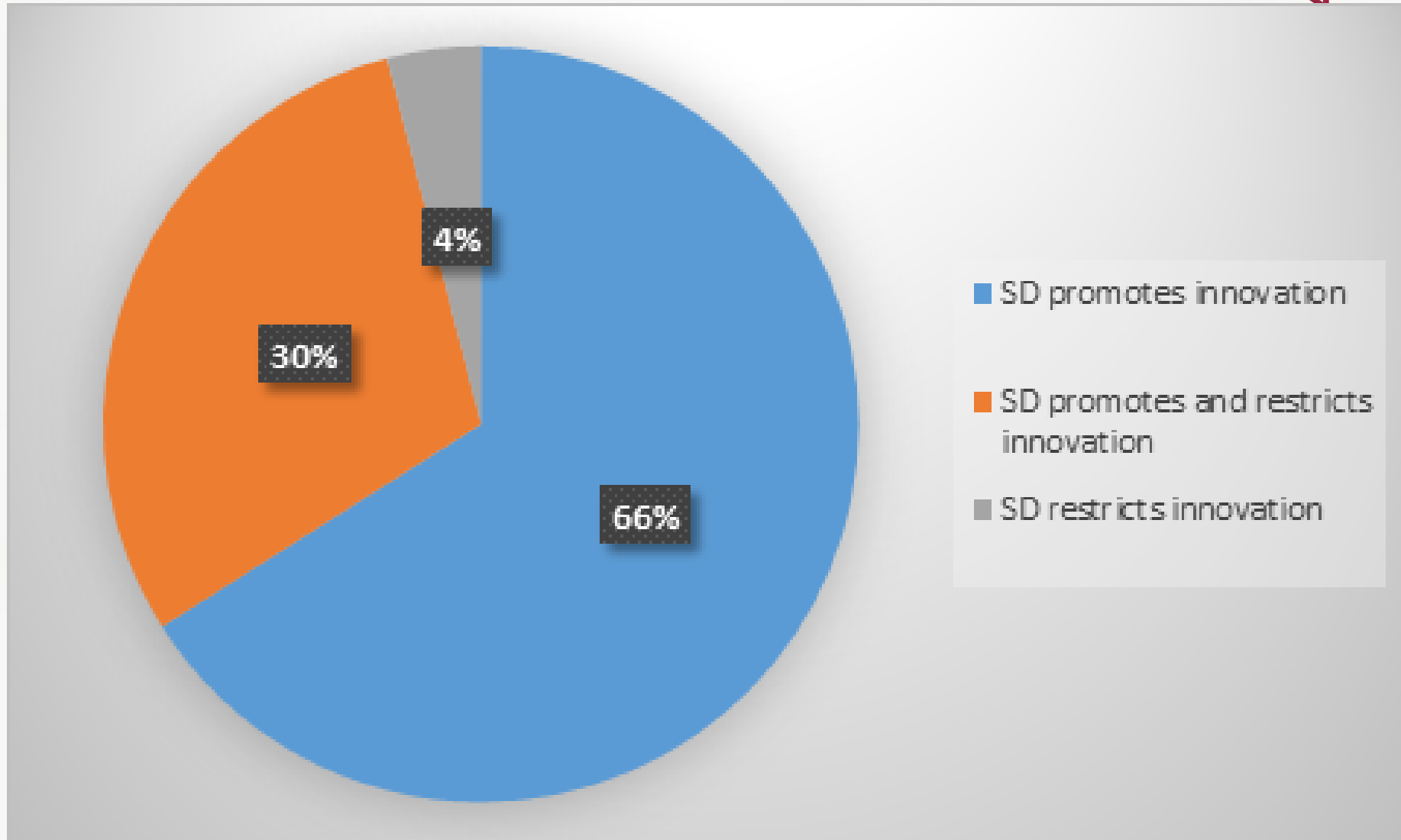
Students' opinion about the reasons for integrating SD in the engineering curriculum at UniLaSalle.



Students' opinion about the reasons for integrating SD in the engineering curriculum at UniLaSalle.

	Agriculture (n = 144)		Nutrition and health sciences (n = 61)		Geology (n = 86)	
	M	SD	M	SD	M	SD
Economic pillar	3.73	1.08	3.46	1.20	3.65	1.08
Environmental pillar	3.74	1.04	3.00	1.10	3.85	1.08
Social pillar	3.17	1.10	3.47	.97	3.15	1.05
Governance energy and mineral resources pillar	2.78	1.18	1.96	.98	4.26	0.83

Students' opinion about the link between innovation and SD in the engineering curriculum at UniLaSalle.





4th

What next ?

A specific and new contribution of this study

A new pillar for SD ? *Energy and Mineral Resources.*

- **disconnected from environment problematic.**
- **strong geopolitical value.**
- **linked together with problems and solutions.**
- **an important node in SD problematic.**
- **directly connected to technology innovation.**

== > No sustainable EMR is no sustainability.

Strongly supported by geologist students.

Research impacts on the actions of and in the Institute



Any publication on the institute’s pedagogic development reflects itself towards and on the institute. It promotes teaching innovations.