

Vers un outil d'awareness émotionnel collectif ?

Des représentations étudiantes aux principes de design.

Toward a collective emotional awareness tool?

From student representations to design principles.

GDR-IHM

Journée collaborative GT EDU x ISA

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Context

Collaborative situations...

Examples of collaborative work

Group 1



Group 2



Teacher



Types of presences

Pillars of collaborative learning: **the "Community of Inquiry" model**

	Cognitive presence	Social presence	Teaching presence	Emotional presence
	<i>Garrison et al., (2000) [2]</i>			<i>Cleveland-Innes & Campbell (2006) [1]</i>
	Knowledge exchange	Socialization among members	Teacher presence	Expression of emotional states
Enables:	Consistent and shared representation of the situation	• Sense of community • Cooperation	• Structuring of interactions • Clear work instructions	Better emotional (self)regulation

[1] Cleveland-Innes, M. and Campbell, P. (2012). Emotional presence, learning, and the online learning environment. *International Review Of Research In Open And Distance Learning*, 13(4), 269.

[2] Garrison, D. R., Anderson, T., & Archer, W.(2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2, 87-105 (2) (PDF) A Constructivist Approach to Online Learning: The Community of Inquiry Framework.

Emotional presence

Unclear, ambiguous

⇒ Lack of:

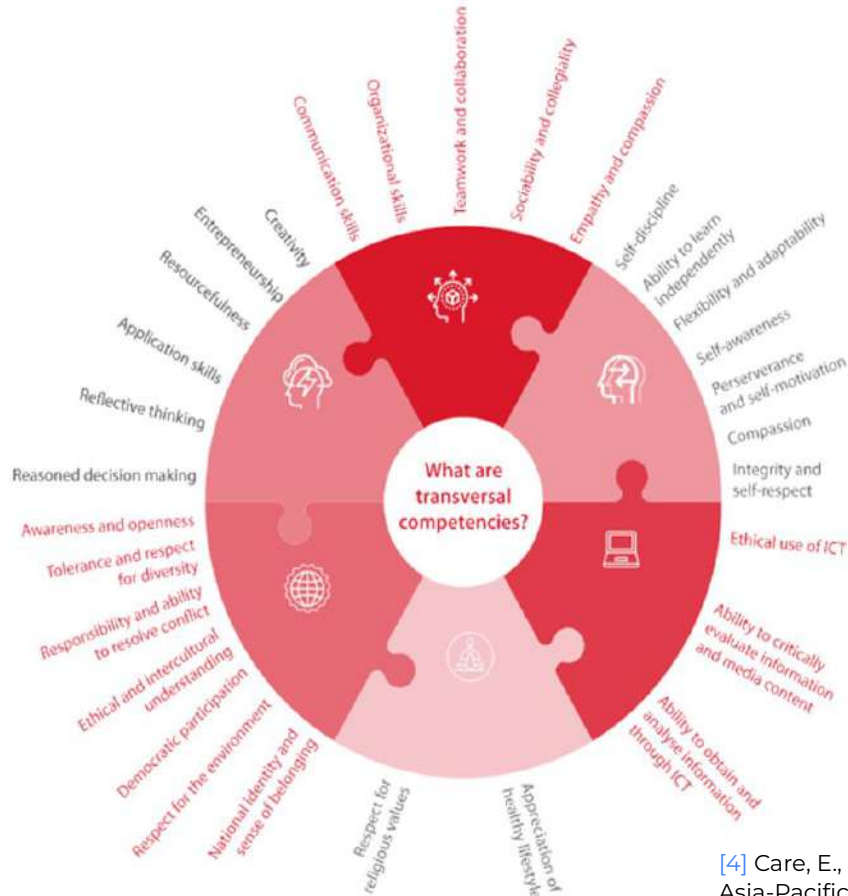
- Physical references
- Words
- Feedback

⇒ Identifying, understanding, expressing, regulating, and using emotions

"In collaborative contexts, socio-emotional interactions can affect learners' cognitive processes, satisfaction with collaboration, and learning outcomes" [3]



UNESCO's transversal skills ^[4]



[4] Care, E., & Luo, R. (2016). Assessment of transversal competencies: policy and practice in the Asia-Pacific region

The emotional states

Everyday emotions, more subtle = “micro-emotions”

- Linked to motor and/or verbal actions
- Subliminal [5;6]

→ Need for real time processes

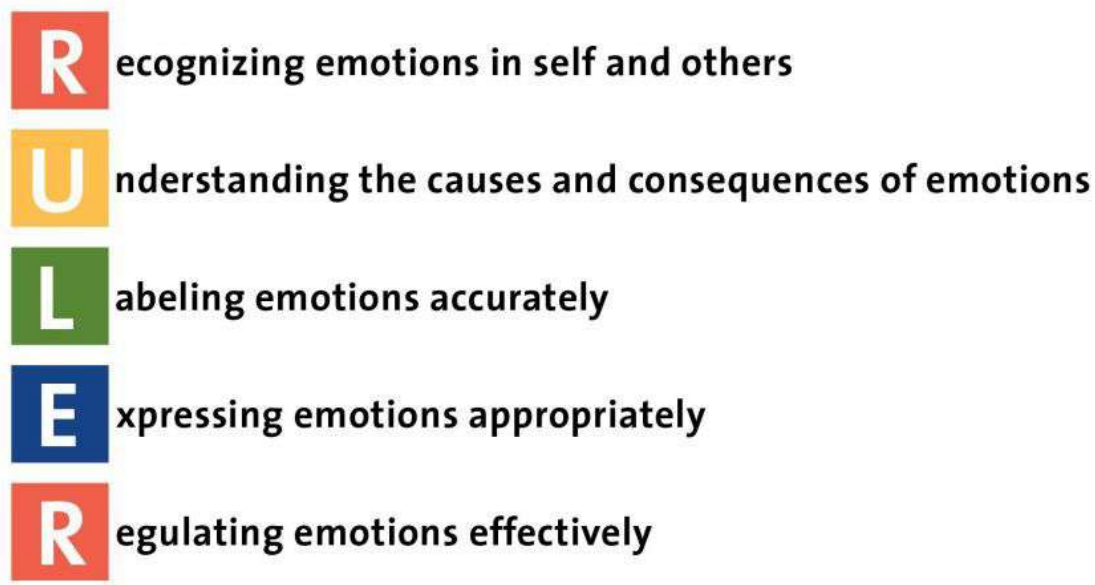
[5] Cosnier, Jacques. (2015). Psychologie des Emotions et des Sentiments.

[6] Miron-Shatz, T., Stone, A., & Kahneman, D. (2009). Memories of yesterday's emotions: Does the valence of experience affect the memory-experience gap? Emotion, 9(6), 885-891. <https://doi.org/10.1037/a0017823>

Emotional skills

Emotional literacy model

- Supportive environment
- Wide range of emotions
- Metacognition



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Limitations

- Mainly used in primary/middle school and not in higher education
- "Lack of time and training" cited by teachers (UNESCO, 2023) [\[8\]](#)



→ How can we **support** the development of **socially shared emotional regulation** (SSeR) skills during **co-located** collaboration?

Methodology: design-based research [9].

Participatory design

1. Exploration

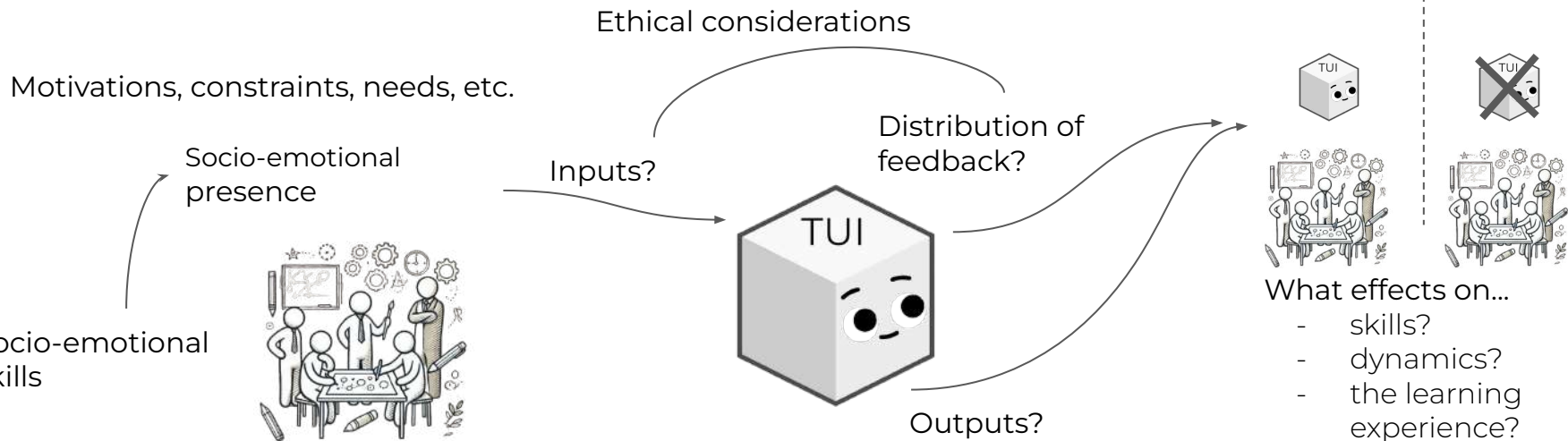
- Focus groups
- Behavioral observations
- Survey

2. Design

- Focus groups
- UX testing

3. Evaluation

- Comparative study in situ



Methodology: design-based research [9].

Participatory design

1. Exploration

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Motivations, constraints, needs, etc.

Socio-emotional
presence

Ethical considerations

Inputs?

Distribution of
feedback?



Outputs?

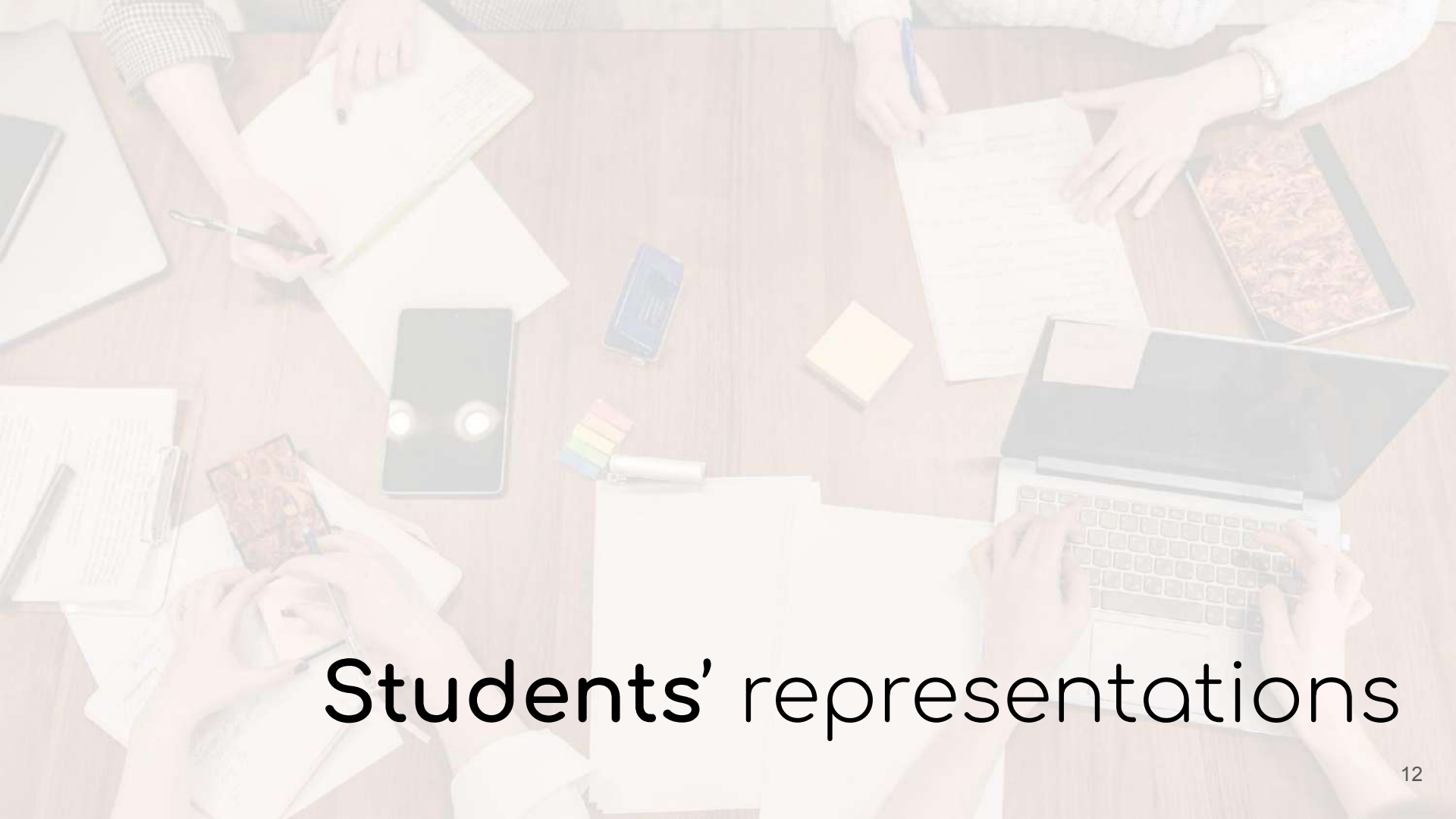


What effects on...

- skills?
- dynamics?
- the learning experience?

Socio-emotional
skills



A top-down view of a wooden table with various school supplies and people's hands working on them. There are several open notebooks, a laptop, a smartphone, a calculator, and some sticky notes. Hands are seen writing, typing, and holding objects. The scene is brightly lit, and the overall atmosphere is one of active learning or collaboration.

Students' representations

Research questions

1. How emotional sharing is perceived, whether mediated by a device or not;
2. How and why they would consider expressing an emotional state in a collaborative learning/group work context;
3. What representations of how to make an emotional state tangible.



Method

24 participants (4-5 persons per group)

- 12 Instructional designers
- 11 Psychology-Ergonomics
- 1 Mathematics degree course



6 sessions

- 2 semi-directed focus groups
- 4 collective creativity session

“Collectively discuss and propose emotional awareness prototypes”

Data analysis

Selection of verbatims

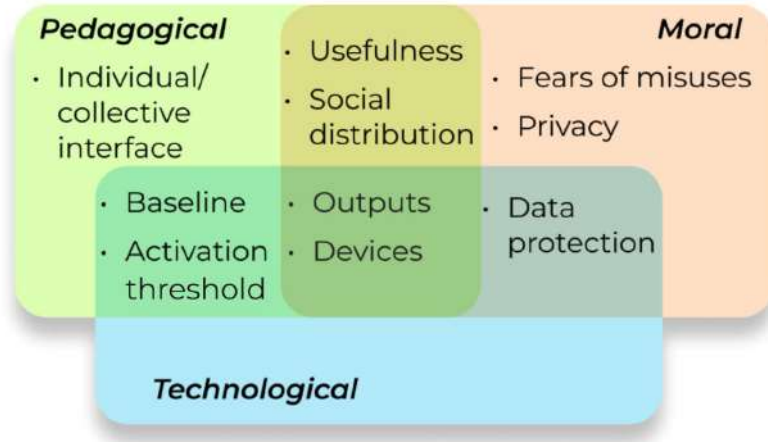
- Manual categorization (speech analysis)
- Textual analysis (Iramuteq software [\[10\]](#)) after corpus cleaning
 - Hierarchical classification
 - Similarity analysis



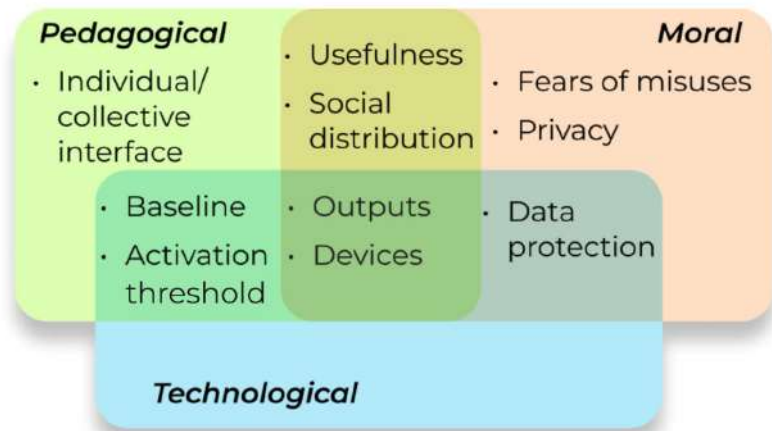


Results

Design spaces



Design spaces

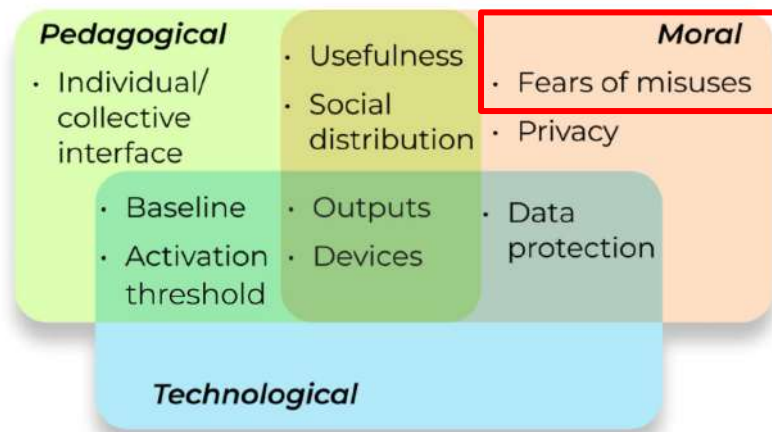


*Design spaces and interface properties
Inspired by Serna et al. (2021)*

Techno Pedago Moral	Properties	Values			
	Perceived usefulness	Educational 	Personal 	Professional 	Disabilities
		[n°111] "It could be gradual, simpler emotions. Depending on what you can identify, you may have more or less (info)."	[n°27] "In a long-distance relationship, if both partners feel the need [...]"	[n°178] "The problem is that it's intrusive, but otherwise it would have been useful in a professional setting."	[n°65] "I find it difficult to understand other people's emotions, so it would definitely help me a lot [...]"
	Reluctance to use	Distinction work/private life 	Human traits issues 		Unnecessary / complex
		[n°35] "I wouldn't want to use this kind of tool because if I'm feeling negative emotions, I don't necessarily want to show it, it's personal."	[n°34] "Emotions are very personal, and you are vulnerable. [...] if the person you are talking to has bad intentions, you don't want them to know that."		[n°99] "As internal capabilities, we're going to become a little stupid. I don't need glasses to see someone crying."
	Emotional privacy	Open 	Selective 		Private
		[n°42] "If there were the option of a private mode, we would hardly use the interface at all in the end."	[n°140] "You can choose to give (the information) to other people."		[n°38] "Having a private mode, with malicious people for example [...], then having that option is good."
	Feedback modalities	Visual 	Somesthetic 	Auditory 	Taste / smell
		[n°70] "Either we change the color, or we choose a color that varies in intensity."	[n°114] "The stronger the emotion, the more it vibrates."	[n°162] "An announcement with the mental state of the people around, like weather."	[n°166] "Integration of comforting scents."
	Interface type	Individual 	Collective 		Mixed
		[n°13] "It would be a kind of necklace."	[n°16a] "A sphere in the middle, with a low-intensity color so as not to be too distracting"		[n°77] "A central object that is connected to our individual objects."
	Threshold	Discrete / strong emotional variations 		Continuous / subtle emotional variations 	
		[n°68] "Small variations aren't really interesting, because they vary a lot, whereas the big variations can add something extra."		[n°66] "What's important is in the neutral zone. [...] So maybe we need something that goes into more detail, something more subtle."	
	Baseline	Neutral 		Categorical 	
		[n°30] "It would be better to start with a neutral approach. That way, you can gauge the mood. [...] I think that would be much more conducive to learning."		[n°28] "I find it interesting to know the emotional state of the person when they arrive, to understand where they are coming from."	
	Information's social distribution	Individual 	Collective 		Mixed
		[n°3] "Each person would have a bracelet, and each movement in the galaxy would represent someone's emotional state."	[n°61] "It might be good to have something global, an overall atmosphere. [...] We'll see a cloud with emotions."		[n°77] "A central object that is connected to our individual objects."
	Device	Wearable [n°127] "If I'm happy today, I'm wearing yellow." 	Control interface [n°10] "Joy would be to agree with the project. We would be forced to choose an emotion; we can't be neutral, we have to take a stand." 		Portable ambient tool [n°4] "I imagined just a cube that vibrates, maybe associated with a color."
		Fixed ambient tool [n°11] "A table [...], with lights of different intensities, if you're really stressed, it gives you a soft blue light. [...] It can vary in brightness, intensity, and color. -" 		Graphical user interface [n°6] "Each individual is associated with a color, an avatar, and we no longer focus on specific emotions but rather on axes displayed on a small screen." 	

[1] Serna, A., Pereira, A., & Lavoue, E. (2022). Un espace de conception pour explorer la continuité des affordances motivationnelles dans un contexte scolaire hybride.: A design space for the exploration of motivational affordances continuity in hybrid learning environments. Adjunct Proceedings of the 32nd Conference on l'Interaction Homme-Machine, 1-6.
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Fears of misuses

Main reluctances :

- Inappropriate reactions
- Stigmatization
- Emotional vulnerability
- Trust between peers (and teacher)

"Seeing other people's emotions can also generate other emotions in you, and not necessarily positive ones if you're not comfortable with emotions."

	Reluctance to use	Distinction work/private life  [n°35] "I wouldn't want to use this kind of tool because if I'm feeling negative emotions, I don't necessarily want to show it, it's personal."	Human trust issues  [n°34] "Emotions are very personal, and you are vulnerable. [...], if the person you are talking to has bad intentions, you don't want them to know that."	Unnecessary /complex  [n°99] "As internal capabilities, we're going to become a little stupid. I don't need glasses to see someone crying."
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Students / teachers point of views' mirror

- Perception of a hierarchical relationship

However → interactions between learners and teachers more impactful on the collaborative learning experience [12].

MUSIC* test : teaching presence as a strong motivational factor

"It really creates a relationship where he knows, but I don't, so why shouldn't I know about him? I would see it more as a relationship of superiority, where he has access to everything."

"This would be detrimental to the dynamics of the class and the teacher-student relationship."

[12] Molinillo, S., Aguilar-Illescas, R., Anaya-Sánchez, R., & Vallespín-Arán, M. (2018). Exploring the impacts of interactions, social presence and emotional engagement on active collaborative learning in a social web-based environment. *Computers & Education*, 123, 41-52.

* Jones, B. D. (2017). User guide for assessing the components of the MUSIC® Model of Motivation.

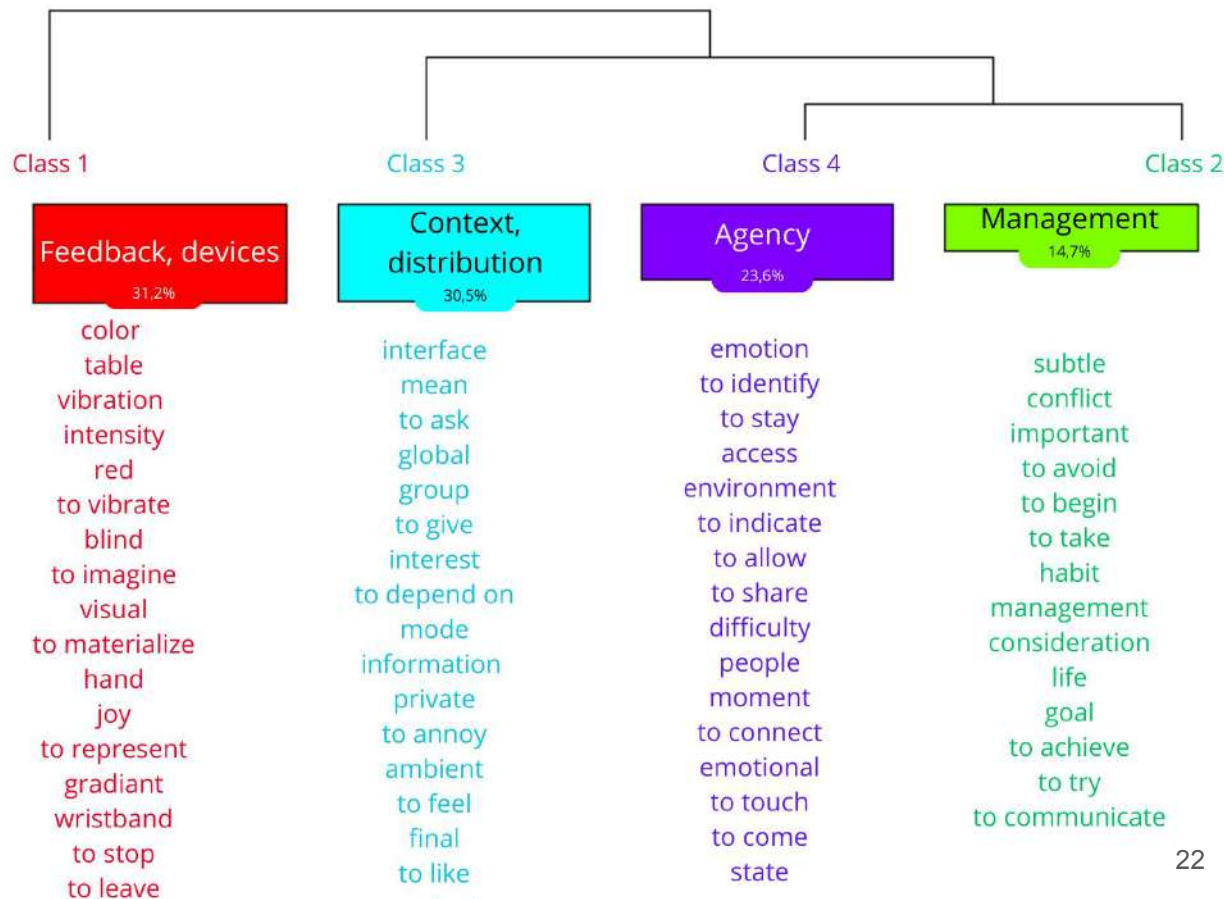
Hierarchical classification analysis

Class 1 : “I suggested that it only vibrated at a certain intensity.”

Class 2 : “It might make you realize that you're not doing well”

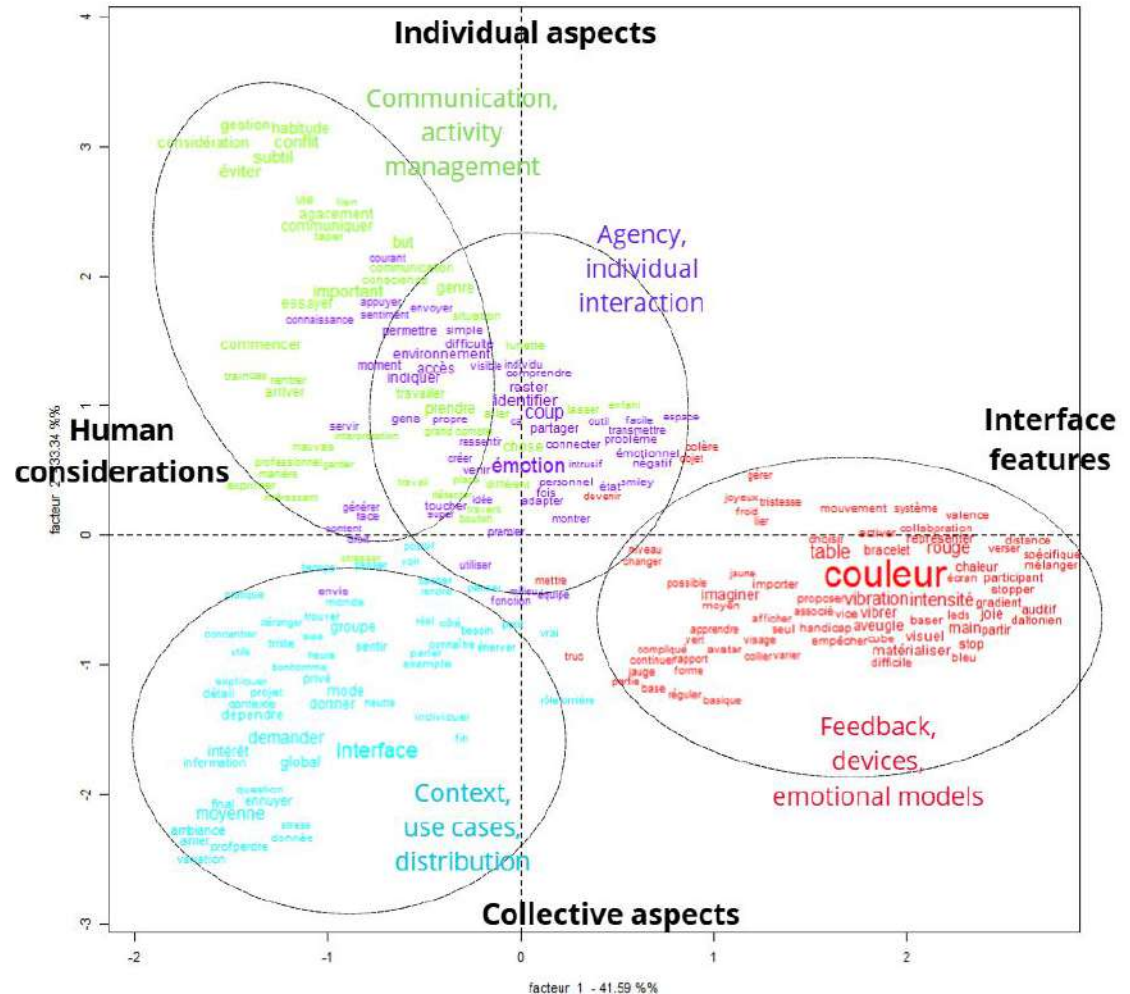
Class 3 : “A global interface will be better than an individual one.”

Class 4 : “How to make individuals aware of their emotions and the environments that caused them.”



Management & agency
rather seen as individual
aspects.

→ Put the collective
back at the centre of
learning



Design challenges - collective responsibility

Need overcoming individual emotional exposition to respect people's privacy .

- Prioritize embodying the **group emotional presence**
- Enhance collective responsibility and metareflection.



Design challenges - pedagogical goal

Emotional regulation

- allows students to address issues related to well-being
- they can focus on academic goals [13].

- But **not considered as a goal** in its own by respondents (students and teachers)

"For me, it would be risky because I would be afraid of how the teacher would view me and therefore, how they would grade me. On the other hand, if I weren't graded, it wouldn't bother me; I wouldn't be afraid of being punished later."

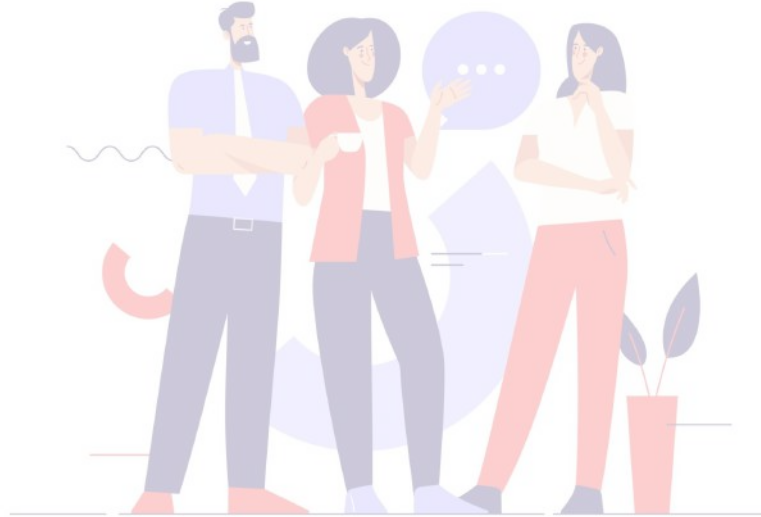
Design challenges - context

Needs :

- To promote a learning environment focused on well-being.
- Based on trusting relationships.
- To revisit traditional approaches (still predominant in higher education) [14].

Design challenges - scaffolding

Scaffolding tool → ambiguous feedback helps spark discussion and metareflection [15].



Assessing the effects

The Ai Act Report [16] mentions:

- interest for “neurominorities”
 - the lack of reliability of the models and emotional inferences used (particularly facial expressions)
 - the lack of research and perspective on the ethical aspects
- highlights the need for studies in this field.

[16] Prohibit emotion recognition in the Artificial Intelligence Act. (s. d.).

Conclusion

- Recommendations to designers about socio-emotional interfaces in educational context :
 - Ethics-centred
 - Educational contributions/orchestration
- ➔ More empirical studies necessary to address ethical questions

Thank you for your attention