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# ToGather, an interactive website for the stakeholders of school inclusion of children with ASD: an iterative design including user testing

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# *ToGather*, an interactive website for the stakeholders of school inclusion of children with ASD: an iterative design including user testing

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# Progress of the presentation



Introduction



Material and  
methods



Results



Discussion and  
conclusion

# Autism and schooling

## Neurodevelopmental condition

- French prevalence : 36,5/10,000 persons  
(Fombonne, *et al.*, 2019)
- Impairments in communication, social skills, restricted interests and activities  
(APA, 2013)
- Large inter-individual variability  
→ huge personalize care and support  
(Fage, *et al.*, 2016)
- The earlier they are included,  
the more they benefit  
(Ferraioli & Harris, 2011; Osborne é Reed, 2011; Salceanu, 2020)

# Autism and schooling

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Results

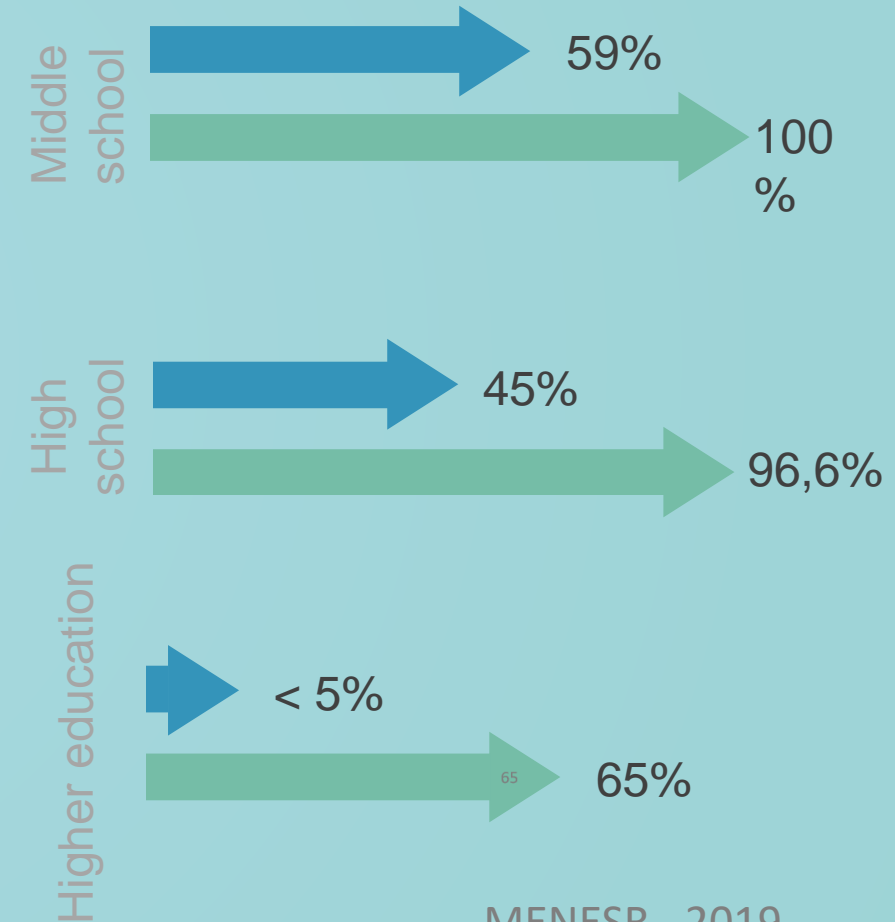
Discussion and conclusion



Neurotypical

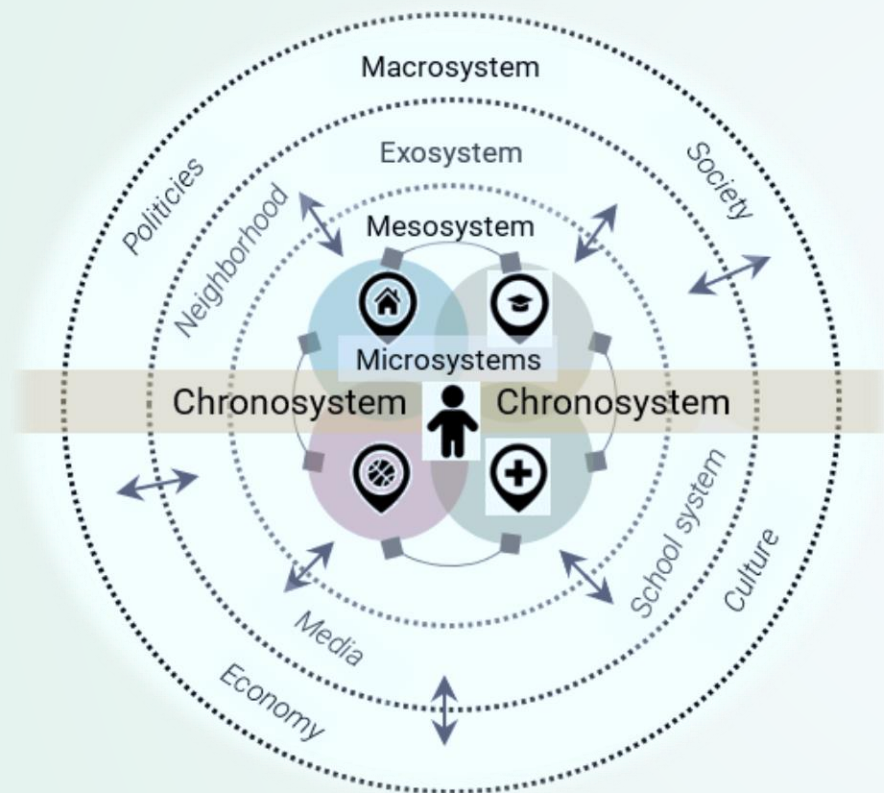


ASD

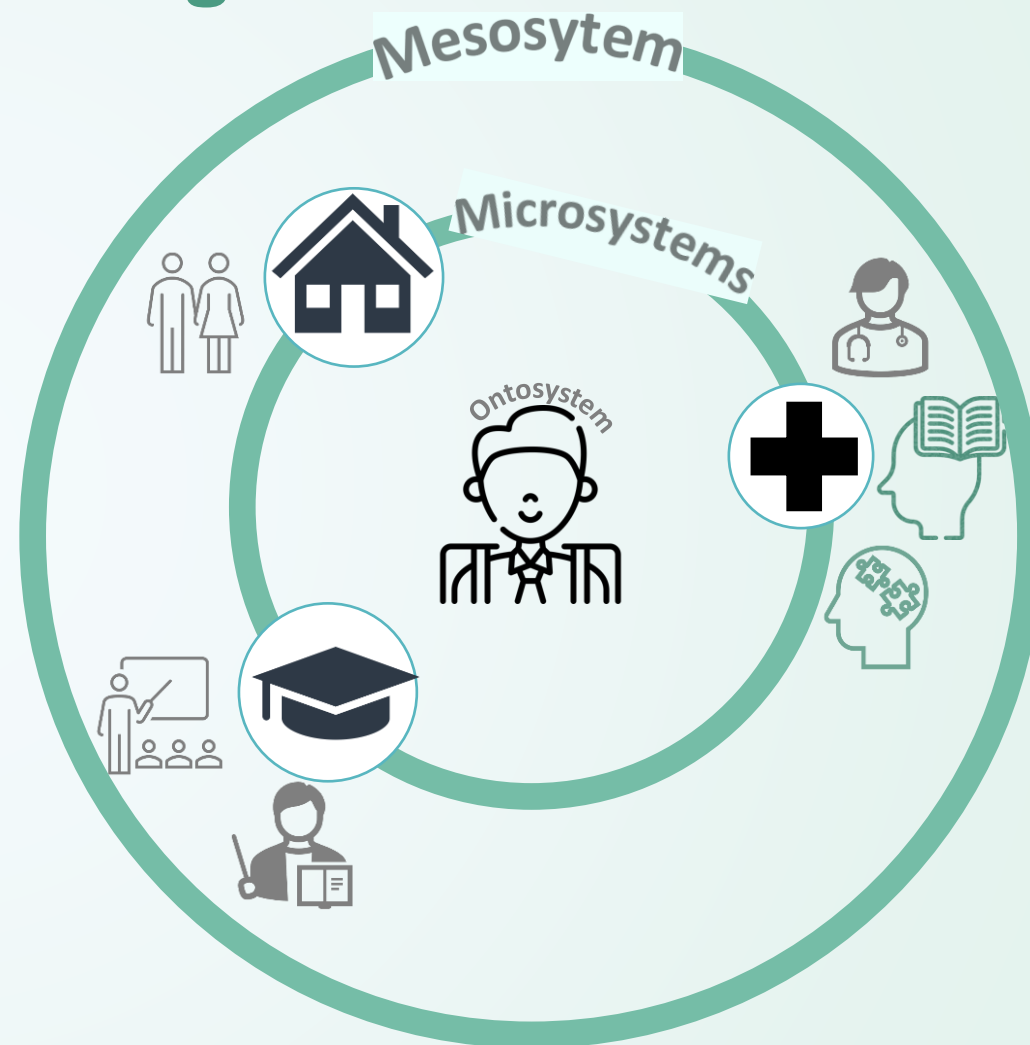


MENESR., 2019

# The ecosystemic approach to leverage the environment



Mazon, 2019



# Factors impacting the school inclusion

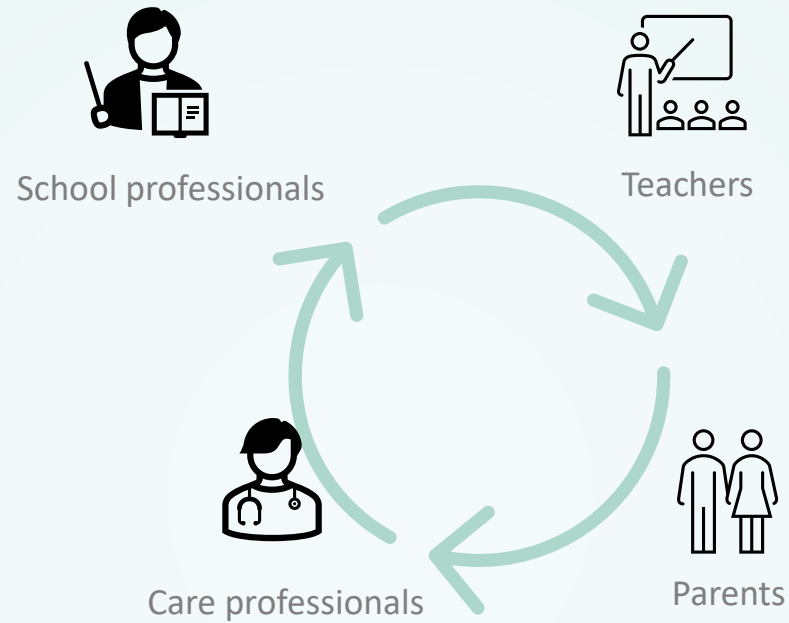
Main barriers to the co-education process:

- Cultural information gap on ASD
- Time availability of the parties involved
- Multi-sectorial information gap
- Evolutivity of the child's educational needs

→ No technology designed to lever up those factors.

# Previous work

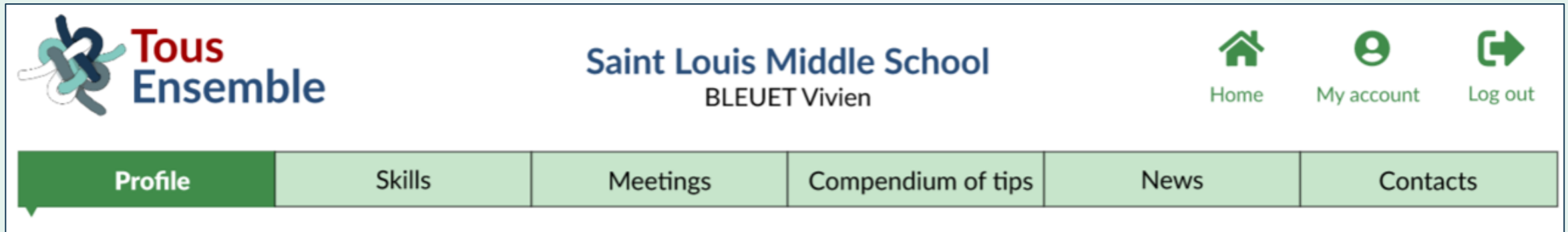
- Design with and for:



- Promote communication and collaboration
- Improve the co-education process
- Produce innovation to address societal issues



# Previous work – the mock-up



## Profile

Particularities of the child  
for a quick familiarization

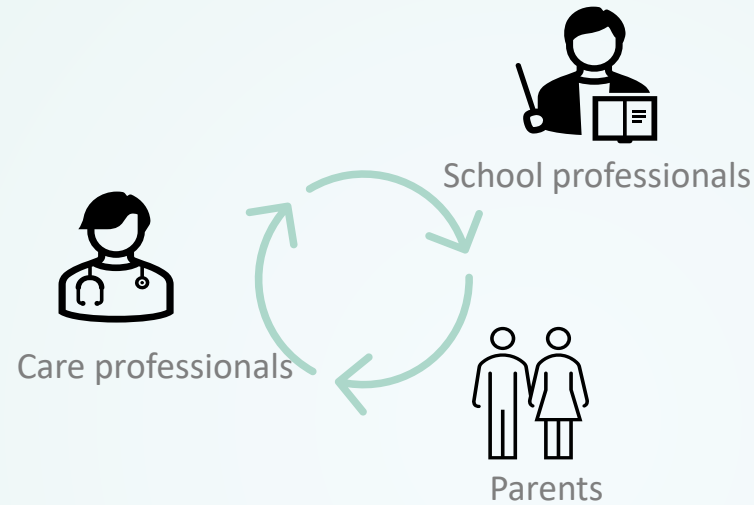
# Previous work – the mock-up



Compendium of tips  
Psycho-educational tips for  
the pupil

# Design of the methodology

- Different schedules
- Limited time
- Different goals



- Usual testing method : free web browsing



# Participants

Personas

Roles



Alex

Parent



Jupiter

Teacher

Care



Jessie

Referent

Nielsen & Landauer (1993) : 5-10 subjects to detect 85% of the main ergonomics design errors



7



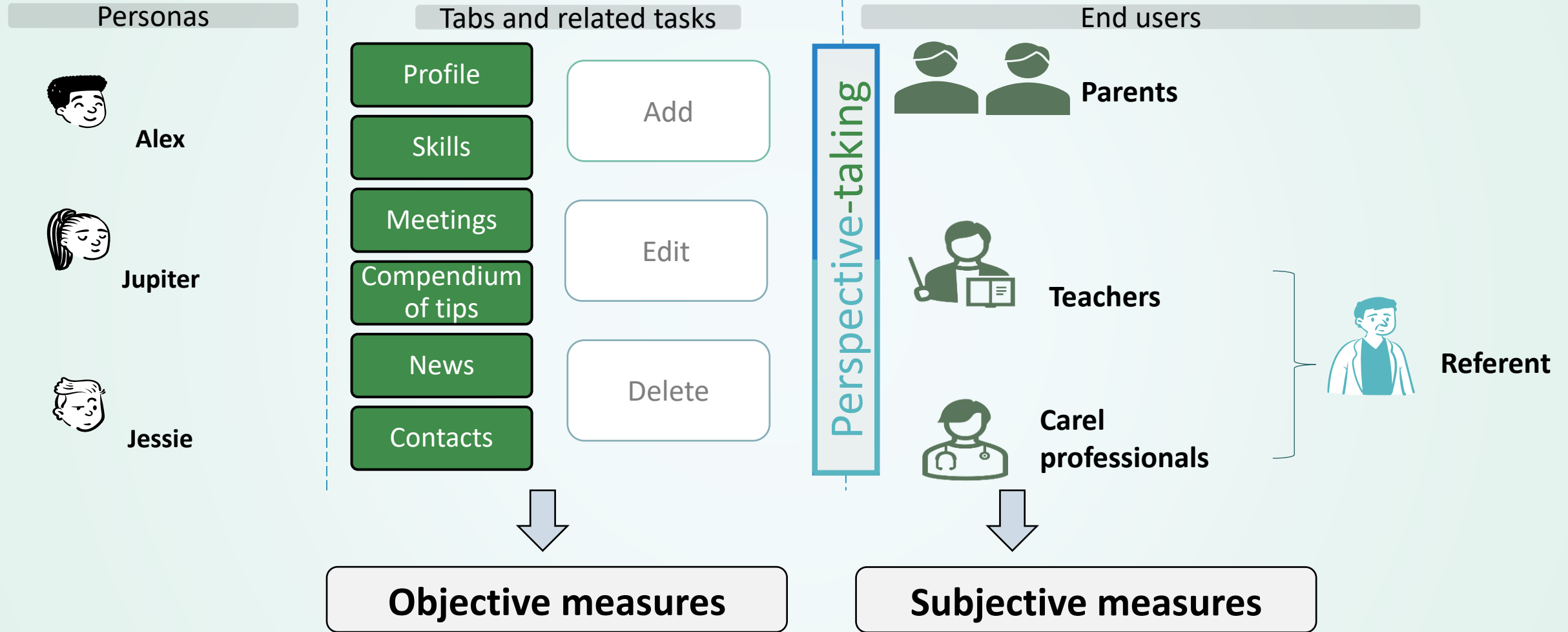
7



7



# Methodology



# Methodology

## Objective measures

- Proportion of correct responses
- Number of active interaction per minute
- Optimality score

## Subjective measures

- Scenario-based Subjective usability
- System Usability Scale
- User Experience Questionnaire
- NASA-TLX
- Elicited self-determination for a collaborative work

**Objective  
measures**

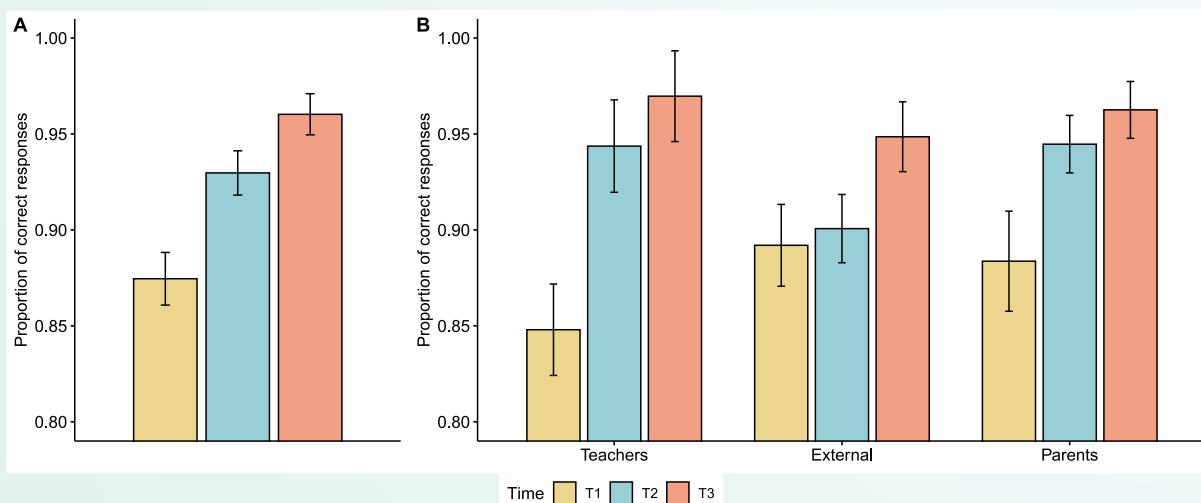
**Subjective  
measures**

# Objectives measures

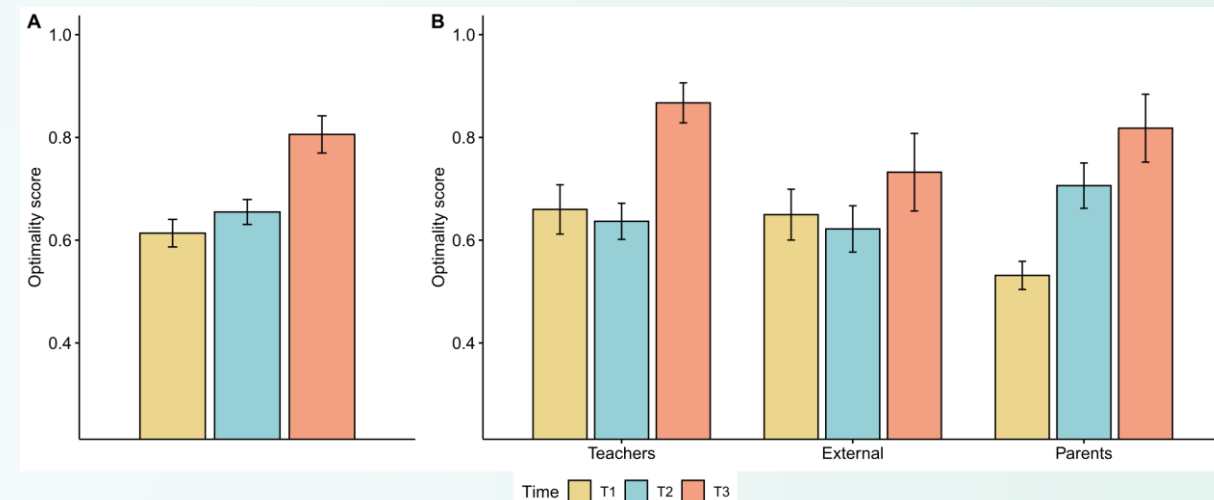
## Inter-rater reliability

- $r=9.968$

## Proportion of correct responses



## Optimal score



# Subjective measures

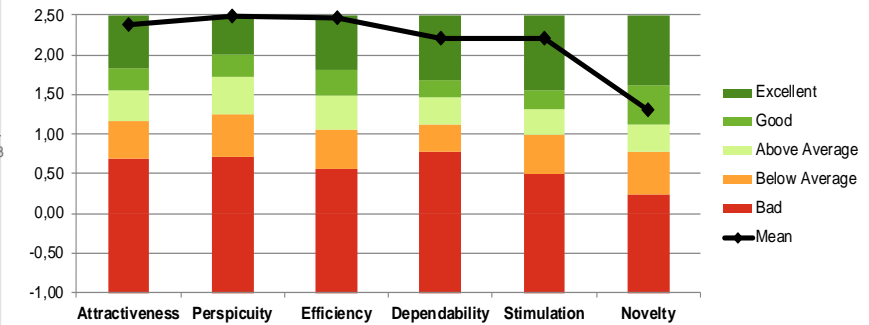
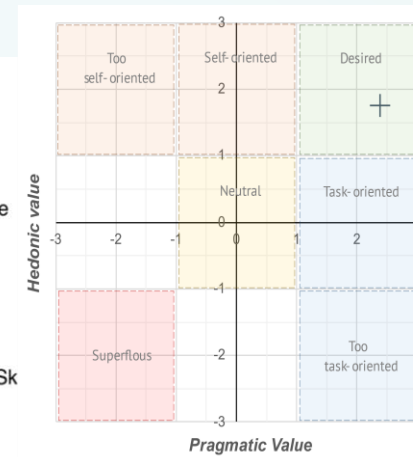
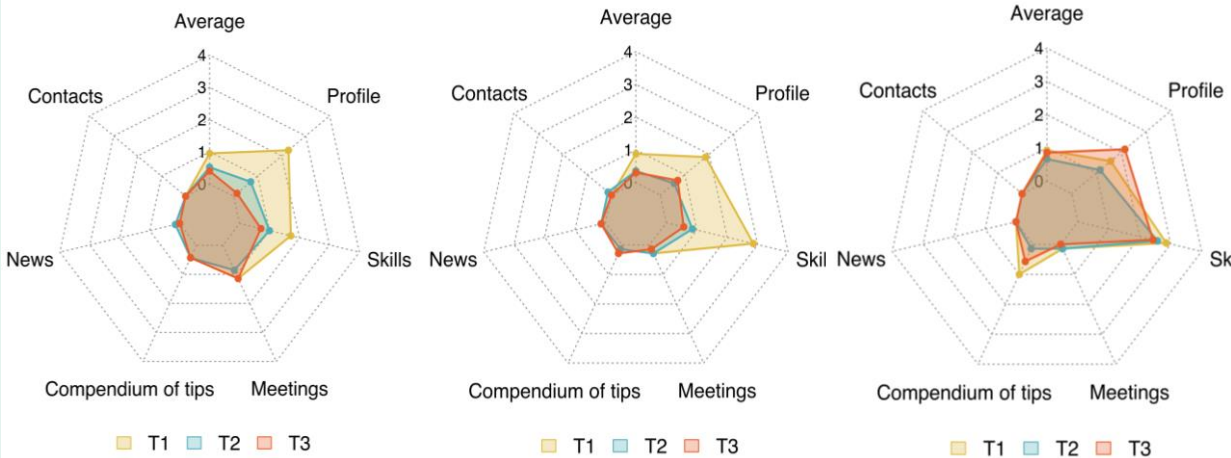
## Scenario-based subjective usability

## User Experience Questionnaire

### Parents

### Teachers

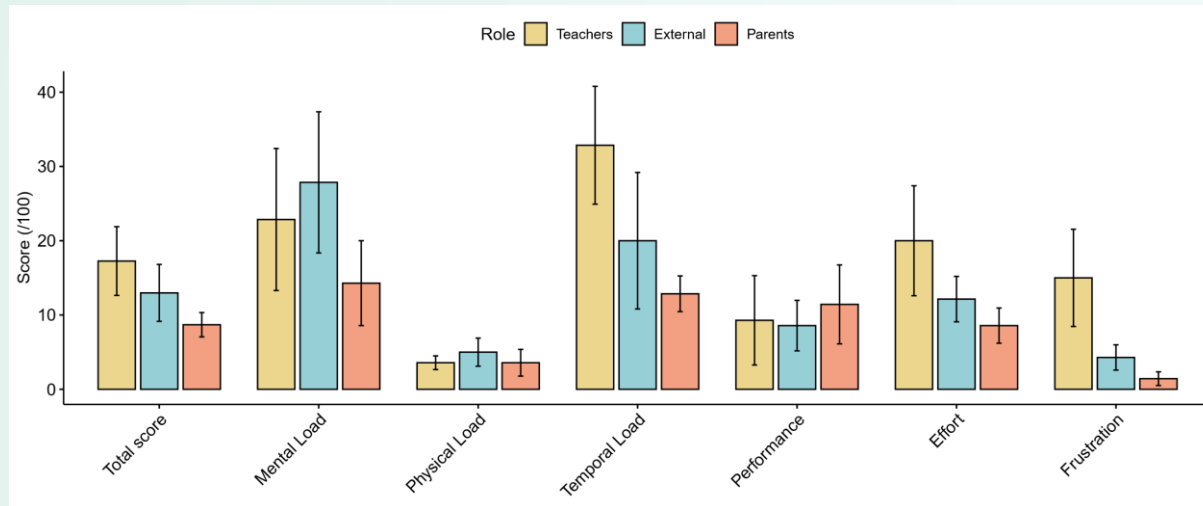
### External actors





# Subjective measures

## Cognitive Load



## Self determination feeling

- Great level of self-determination feeling for collaborative activities

# Discussion

- Great self-determination feeling underlines the need for a collaborative tool
  - Gather information
  - Empowers each stakeholder
  - Participate in every collective decision
  - Coordinate actions
- Difficulties decreased and even disappeared across scenarios
- Conducting user test before the final version is crucial to meet users' needs



# Limitations

- Non-homogeneous features across tabs

Average number of features per tab

Dashboard	Profile	Skills	Meetings	Compendium of tips	News	Contacts
2	4,5	7	1 to 10	1 to 8	3	1

- Collection of interaction data



- Usage of scenario



# Conclusion

- Participatory design
- ToGather meets the demands
  - Excellent user experience
  - Low cognitive load
  - Easy to use

The screenshot shows a user profile page for Vivien BLEUET. The page is titled "CoEd logo" and "Saint Louis Middle School" with the user's name "Vivien BLEUET". Navigation links include "Home", "My account", and "Log out". The profile is divided into sections: "Profile", "Skills", "Meetings", "Compendium of tips", "News", and "Contacts".

**Profile**

**BLEUET Vivien**  
 Class: 8  
 Age: 15 years old

**What's up?**

Mark everything as read

**New solution**  
 By E. MARTIN  
 On Friday, January 1<sup>st</sup>, 2022

**New news**  
 By E. MARTIN  
 On Friday, January 1<sup>st</sup>, 2022

**Strengths**

- Aware of external danger
- Autonomy, performs daily tasks alone
- Concentration higher than 20 min
- Finds his way in space

**Difficulties**

- Can not orally give complex explanations.
- Difficulty to locate in time
- Difficulty to assess social codes (Write a letter, handle his money).

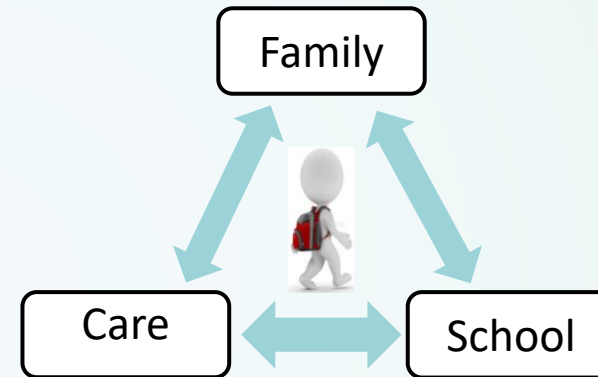
**School experience**

- Year 2020-2021: Considerable progress: Asks teachers for help when he does not understand.
- Arrived in the middle of school year in 2019 in middle school : did not speak at all.

# What comes next

## A field assessment

- To test ToGather in the field via a weekly use
- Recrutement of dyad minimum composed of:
  - Parent & specialized teacher / main teacher
  - Parent & main carer (often specialized educator)
- 2 semesters
- 3 assessments spaced 3 months appart



In the future: *ToGather* from middle school to University

**THANK YOU !**



**TOUS ENSEMBLE**

Time for questions