



BEHAVioral management model across Europe
Project number: 2017-1-IT02-KA201-036540

Introducing evidence-based practices to manage problem behaviours at school: the BEHAVE application

Gianluca Merlo, Antonella Chifari, Giuseppe Chiazzese, Davide Taibi, Silvia Alves,
Colin McGee, Sebastian Bilanin, Isabella Giammusso, Melanie Van Oort-Hall,
Nicola Lo Savio, Luciano Seta

19th European Conference on e-Learning
28-30 October 2020

- 20% of students exhibit problem behavior that disrupt the functioning of the class, impacting negatively on teachers and peers, and compromising learning (Brauner & Stephens, 2006; Satcher, 2004).
- Classes with students manifesting problematic behaviors have 4 hours less of instruction time per week. (U.S. Department of Education [USDOE], 2006; Walker, Ramsey, & Gresham, 2004).
- Increase of time used to behavior problem management and decrease of teachers and students engagement in the lesson (Balderson 2005)





Single-subject research methods are particularly suitable for educational aims.

They are:

- a **powerful tool** to **test** the **effectiveness** of certain **interventions** or practices; **Teachers need** to understand the **effect** of a particular **strategy** to be effective in changing **maladaptive behaviours**.
- **don't require populations** that fulfill certain conditions;
- **implementable** under usual **educational circumstances**, allowing educators to adapt their monitoring processes to different situations in a flexible way.

The use of **Information and Communication Technologies**

can provide efficient automated tools for **collecting data** and **monitoring progresses** during intervention (Glasgow et al, 2004).

Moreover, **technology saves time** and provides more **accurate** and **reliable behavioral records** (Spachos et al, 2014)



They are often:

- **bonded** to a specific reference **theory**;
- **not flexible** or customizable;
- **suitable** only for a **specific disorder** or educational need;
- **commercial** or not released with open source licenses.





DESIRED FEATURES

SUITABLE FOR MANY NEURO
DEVELOPMENTAL DISORDERS

CREATION/IMPORT CUSTOM MEASURES

MULTIPLE SINGLE CASE DESIGNS

AUTOMATIC STATISTICAL ANALYSES

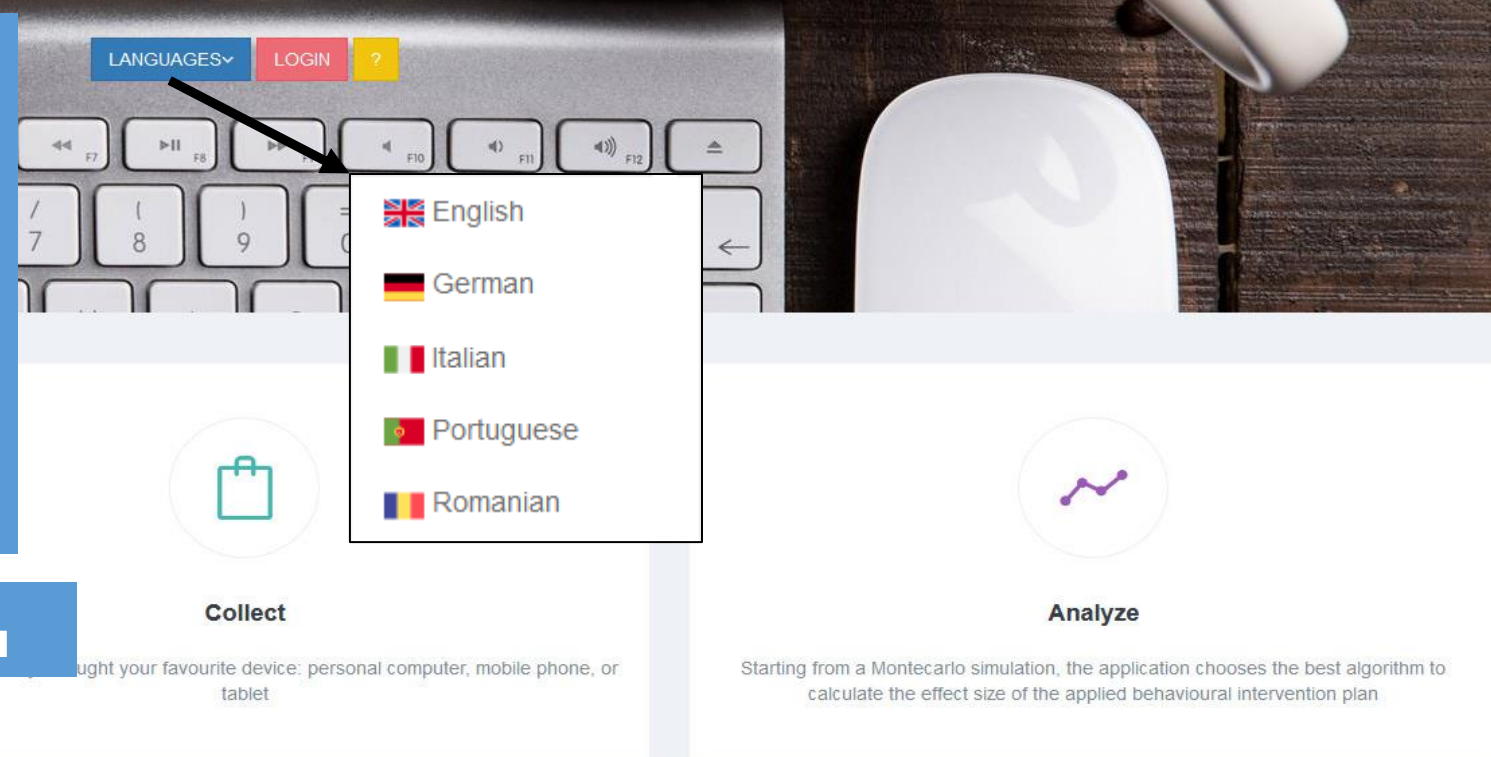
RESPONSIVE DESIGN

BEHAVE application

AN ICT-BASED SOLUTION SUPPORTING THE OBSERVATION AND THE MANAGEMENT OF PROBLEM BEHAVIOURS

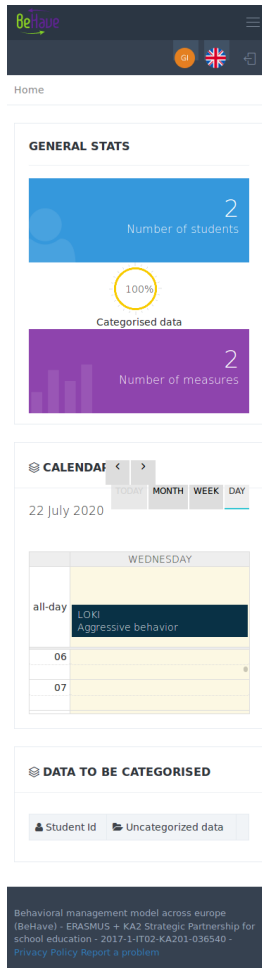
The **BEHAVE application** is an open source **web application** aimed to ease the way for **teachers** to apply **behavioural evidence-based interventions** at school.

<https://app.behaveproject.eu>

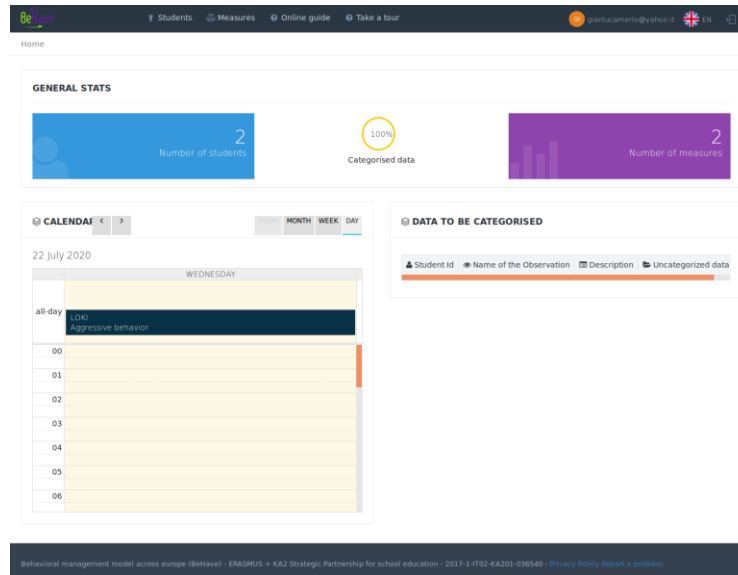


The screenshot shows the top navigation bar of the BEHAVE application. It includes a 'LANGUAGES' dropdown menu, a 'LOGIN' button, and a help icon. The dropdown menu is open, displaying five language options: English (UK flag), German (German flag), Italian (Italian flag), Portuguese (Portuguese flag), and Romanian (Romanian flag). Below the navigation bar, the interface is divided into two main sections: 'Collect' and 'Analyze'. The 'Collect' section features a shopping bag icon and the text 'Choose your favourite device: personal computer, mobile phone, or tablet'. The 'Analyze' section features a line graph icon and the text 'Starting from a Montecarlo simulation, the application chooses the best algorithm to calculate the effect size of the applied behavioural intervention plan'.

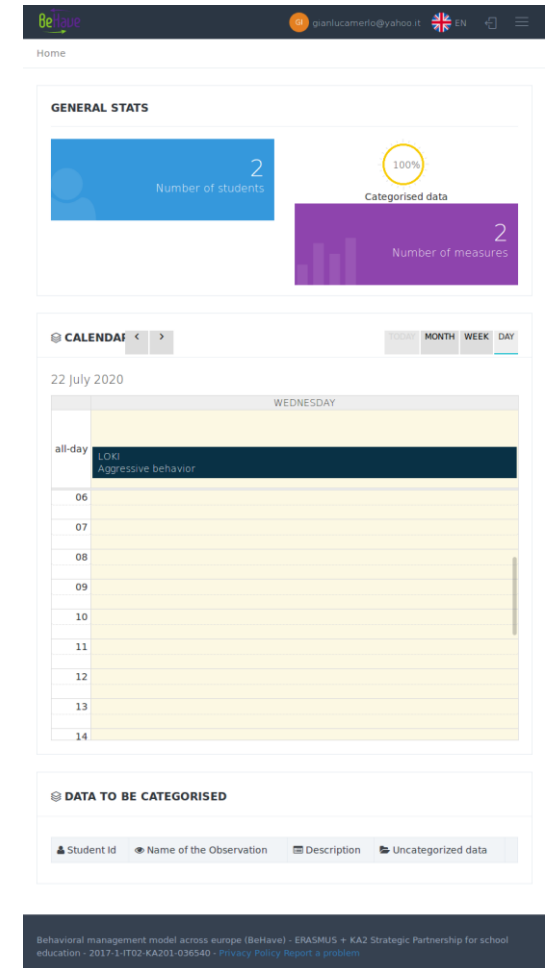
iPhone X



Desktop



iPad



ARE YOU AN EXPERT IN
BEHAVIOUR MANAGEMENT?




A dark wooden desk with school supplies including pens, pencils, paper clips, and sticky notes. The text "STEP 1: Student creation" is centered on the desk.

STEP 1:
Student creation

Students


LIST +



test

✎ 👁 🗑

A **student's name** must be inserted to start the **behavioural monitoring process**. Students are characterized by id's or nicknames to guarantee the **safety** of pupils' **personal data** conditions.

A dark wooden desk with stationery items: pens, paper clips, and pencils.

STEP 2:
Measure creation

Compose your measure

Name*

Description*

+ Add item Submit Cancel

- Choice
- Direct Observation
- Integer
- Four Quadrant Diagram
- Range
- Text

Widget typology	Description	Validation rules
Choice	The widget creates a radio buttons and a selection process. Multiple selections of values are allowed.	The values sent from the form have to be the same as those included in the lists.
Direct observation - duration	The widget is designed to measure the duration of a phenomenon.	The values sent from the form have to be in the timestamp format.
Direct observation - frequency	The widget is aimed to count the occurrences of a phenomenon.	The values sent from the form have to be in the timestamp format.
Integer	The widget is aimed at supporting the creation of items with a numeric response.	The value sent from the form has to be an integer.
Four quadrant diagram widget	The widgets is intended to create a cartesian plane. The user has to select the point in the plane where he feels to belong according to the predefined categories.	The values sent from the form are 2 integers, 1 for the x axis and 1 for the y axis.
Range	The widget is intended to create an input with a numeric value which must be no less than a given value, and no more than another given value.	The value sent from the form is included in the planned range.
Text	The widget is intended to create a textual input.	The value sent from the form must be a textual type.

Compose your measure

Name of the measure*

Description*

Import items ?

Browse... No file selected.

+ Add item Submit

1

Import measure

File*

Browse... No file selected.

Submit

A dark wooden desk with various school supplies. In the top left, there are several pens in green, blue, and black. In the top right, there are green and purple sticky notes. In the bottom left, there are several blue paper clips. In the bottom right, there are several colored pencils in blue, yellow, green, and purple. The text is centered on the desk.

STEP 3:
Plan the observation

New observation No Single case?

Name*

Description*

Place

Setting

Measure*

Filling instructions

Schedule observation dates*

 ON

Repeat option

every n week(s)

Weekly days of week

 Sun Mon Tue Wed Thu Fri Sat

Repeat end option

Nr. occurrences

Students

CALENDAR

< > TODAY MONTH WEEK DAY

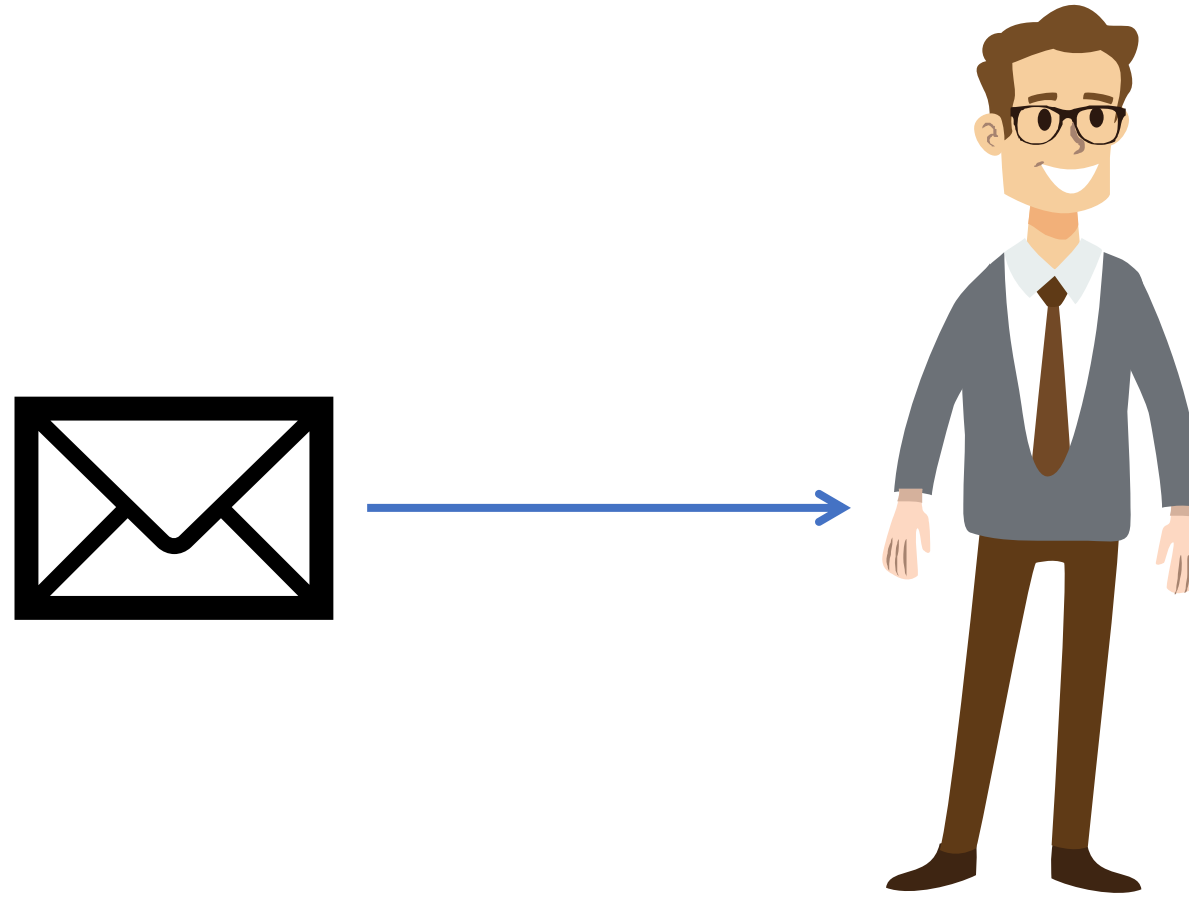
May 2019

SUN	MON	TUE	WED	THU	FRI	SAT
28 10a Interruption of d	29 10a Interruption of d	30	1 10a Interruption of d	2	3 10a Interruption of d	4
5 10a Interruption of d	6 10a Interruption of d	7	8 10a Interruption of d	9	10 10a Interruption of d	11
12 10a Interruption of d	13 10a Interruption of d	14	15	16	17	18
19	20	21	22	23	24	25

The **behaviour** has to be defined describing the behaviour in a **specific way** that makes it possible to **identify** the same behaviour when observed by different people.

A top-down view of a dark wooden desk. In the top left, there are several pens in green, blue, and black. In the top right, there are green and purple sticky notes. In the bottom left, there are several blue paper clips. In the bottom right, there are several colored pencils in blue, yellow, green, and purple. The text "STEP 4: Data collection" is centered on the desk in white.

STEP 4:
Data collection



The "observer" will receive a notification via email to remind him to collect the data at the right time.

Data gathering about test

🏠 Interruption of discussions during the class

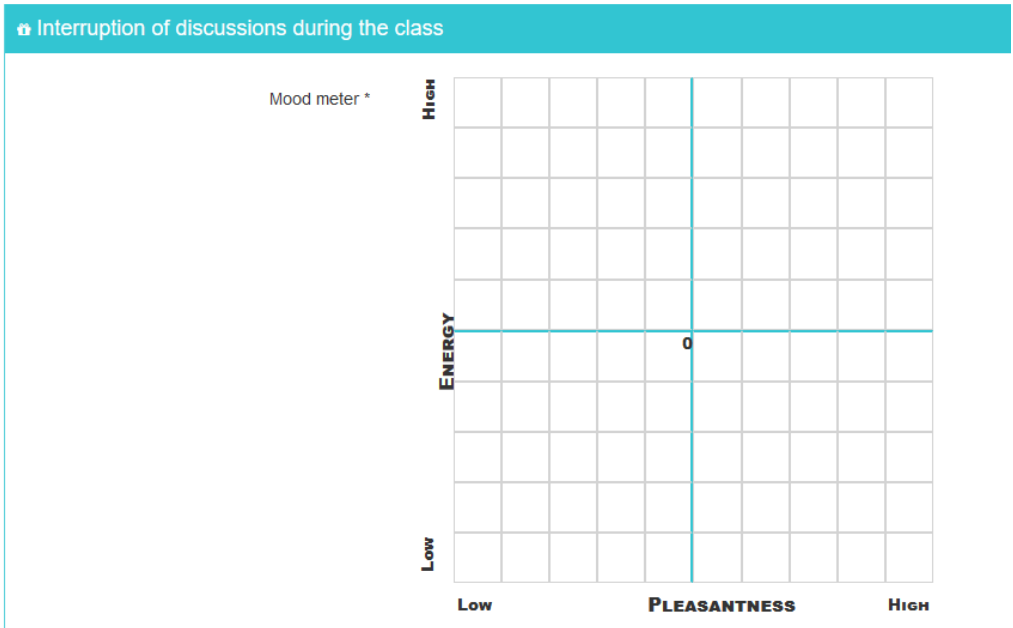
Interruptions*

Data gathering about test

🏠 Interruption of discussions during the class

How many times?*

Data gathering about test



Data gathering about test

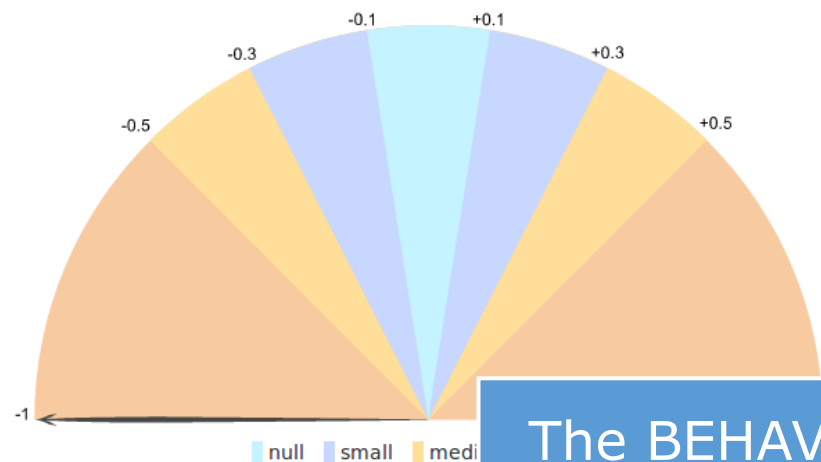
🏠 Interruption of discussions during the class

How many times?*

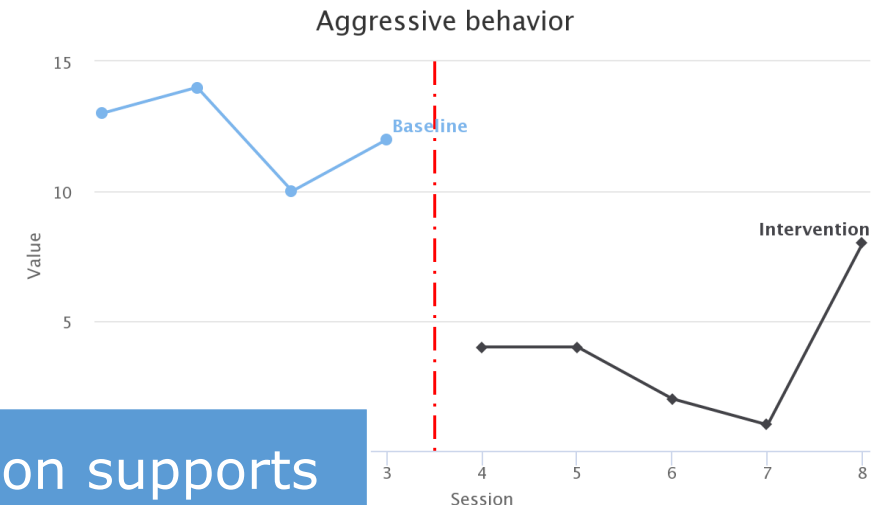
A dark wooden desk with various stationery items. In the top left, there are several pens in green, blue, and black. In the bottom left, there are several blue paper clips. On the right side, there are several colored pencils in blue, green, yellow, and purple. A green sticky note is partially visible in the top right corner. The text "STEP 5: Data analysis" is centered on the desk in white.

STEP 5:
Data analysis

SPEEDOMETER: AVSB



The effect size
The treatment has a large effect on the de



The BEHAVE application supports both **visual** and **statistical analyses**. It calculates the **best algorithm** according to the provided **dataset**.

PARKER'S TAU-U Partition and Full Matrices

	TREND A	TREN	
n pairs	6	10	
n pos	2	4	
n neg	4	5	29
S	-2	-1	-23
Tau	-0.333	-0.1	-0.639
SDs	2.944	3.958	9.539
VaRs	8.667	15.667	91
Z	-0.679	-0.253	-2.411
p(Z based)	0.497	0.801	0.016
r Effect Size	-0.499	-0.156	-0.843

TREND B A vs B + TREND B - TREND A

			36
			8
n neg	20	25	27
S	-20	-21	-19
Tau	-1	-0.7	-0.528
SDs	8.131	9.083	9.539
VaRs	66.111	82.5	91
Z	-2.46	-2.312	-1.992
p(Z based)	0.014	0.021	0.046
r Effect Size	-1	-0.891	-0.737

SHORT TERM

- use the application in real educational contexts;
- export cases in a behavioral repository;
- add new translations;
- continue the dissemination through multiple channels.

MEDIUM TERM

- improve the usability of the interface;
- write new international projects to push forward the project results.

LONG TERM

- make the application even more flexible and wider in scope.

A close-up photograph of a hand holding a silver pen, writing the words "Thank You!" in a cursive script on a white surface. The pen is positioned at the end of the word "You", with the tip of the nib touching the paper. The background is a soft, out-of-focus white.

Thank You!

Email: gianluca.merlo@itd.cnr.it

Project website: <https://www.behaveproject.eu/>