The BASE application: An evidence-based support tool to promote a digitally assisted school-wide intervention.

Antonella Chifari, Giuseppe Chiazzese, Gianluca Merlo, Eleonora Maniscalco, & Luciano Seta

Consiglio Nazionale delle Ricerche - Istituto per le Tecnologie Didattiche, U.O. Palermo (Italy)

base@itd.cnr.it

Utrecht, **November 8th and 9th 2018**

BASE

Behavioral Assessment to Improve School Environment

Erasmus+

Aim of this presentation

To present a preview of the set of functionalities of the BASE system in order to:

- receive feedback and suggestions for the next step of development process;
- collecting comments from stakeholders and experts

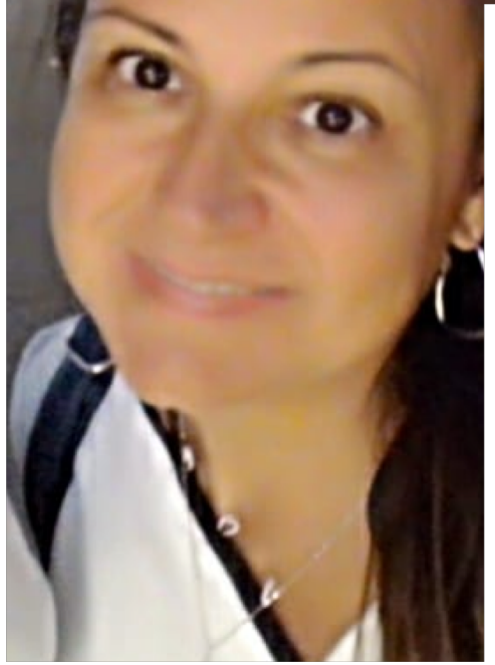
Behavioural Assessment to improve School Environment (BASE) Project

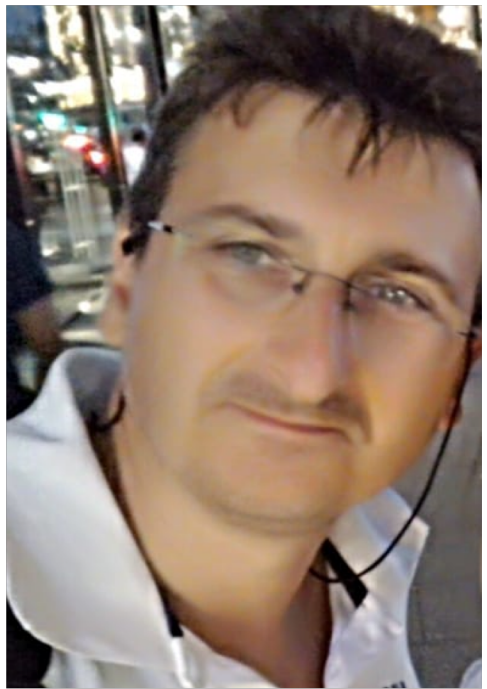
- The application is the major output of the **BASE European Erasmus+ project**, aimed at response to the European requirement of reforming the whole scholastic disciplinary system to offer students the opportunity to experience the school context as socially predictable, consistent, safe and positive where norm-violating behaviour is minimized, and prosocial behaviour is promoted.
- The Project identifies in the proven US-born concept of the Positive Behaviour Support (**PBS**) supported by the functional behavioural assessments (FBAs) one possible solution and tries to adapt its practical and evidence-based principles to the heterogeneous European school settings.

BASE
Behavioral Assessment to Improve School Environment

Erasmus+

7 Scientific partners
5 European schools (PT, RO, IT, TR, NL)





The research group

Research activities

investigate and introduce an evidence based approach in the teaching and learning process.

design evidence-based tools for facilitating mobile digitally assisted observation processes and evaluation practices.

BASE
Behavioral Assessment to Improve School Environment

WHAAM
Web Health Application for Adhd Monitoring

whaamproject.eu

BASE
Behavioral Assessment to Improve School Environment

baseproj.eu

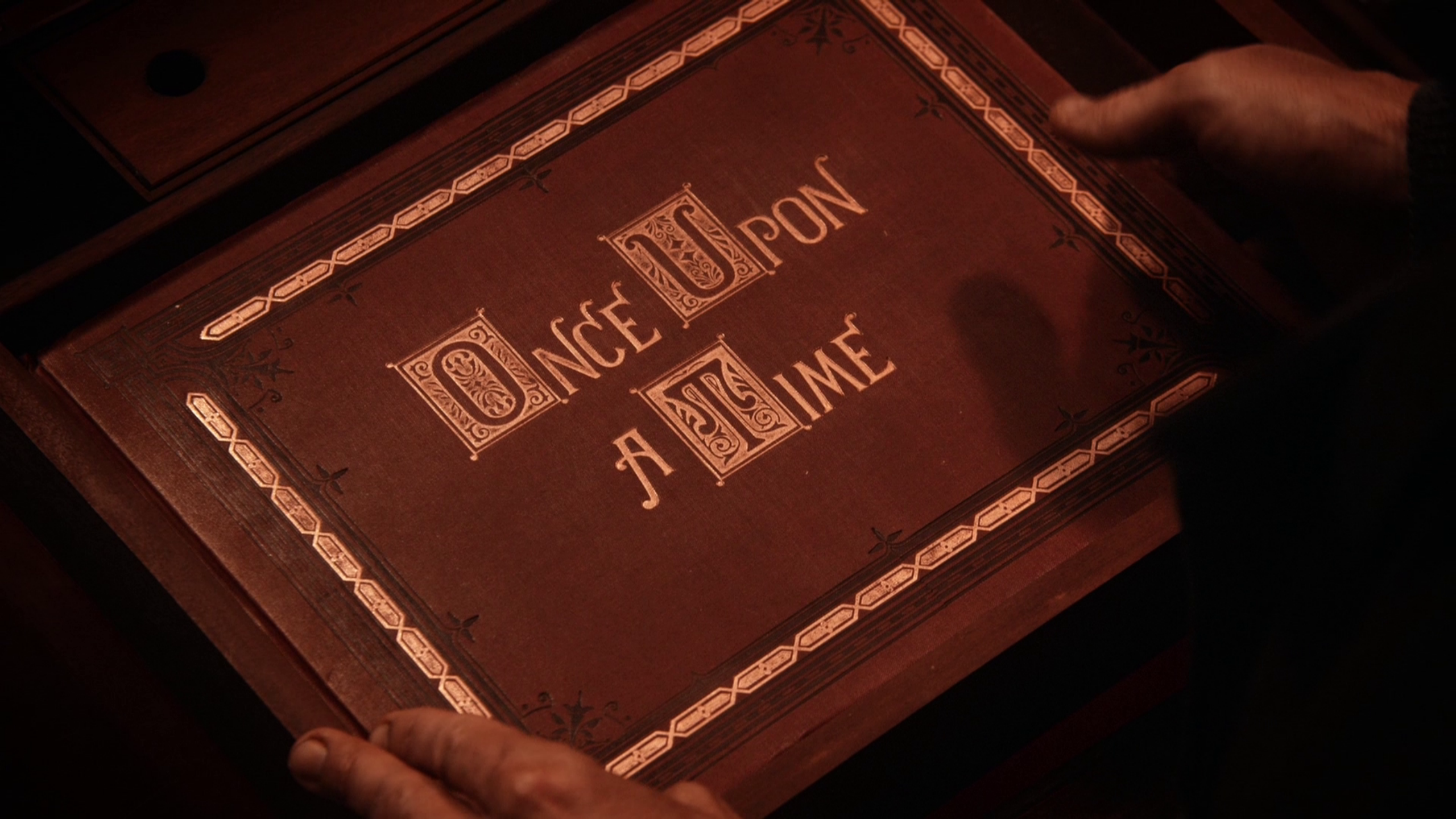
AHA
ADHD AUGMENTED

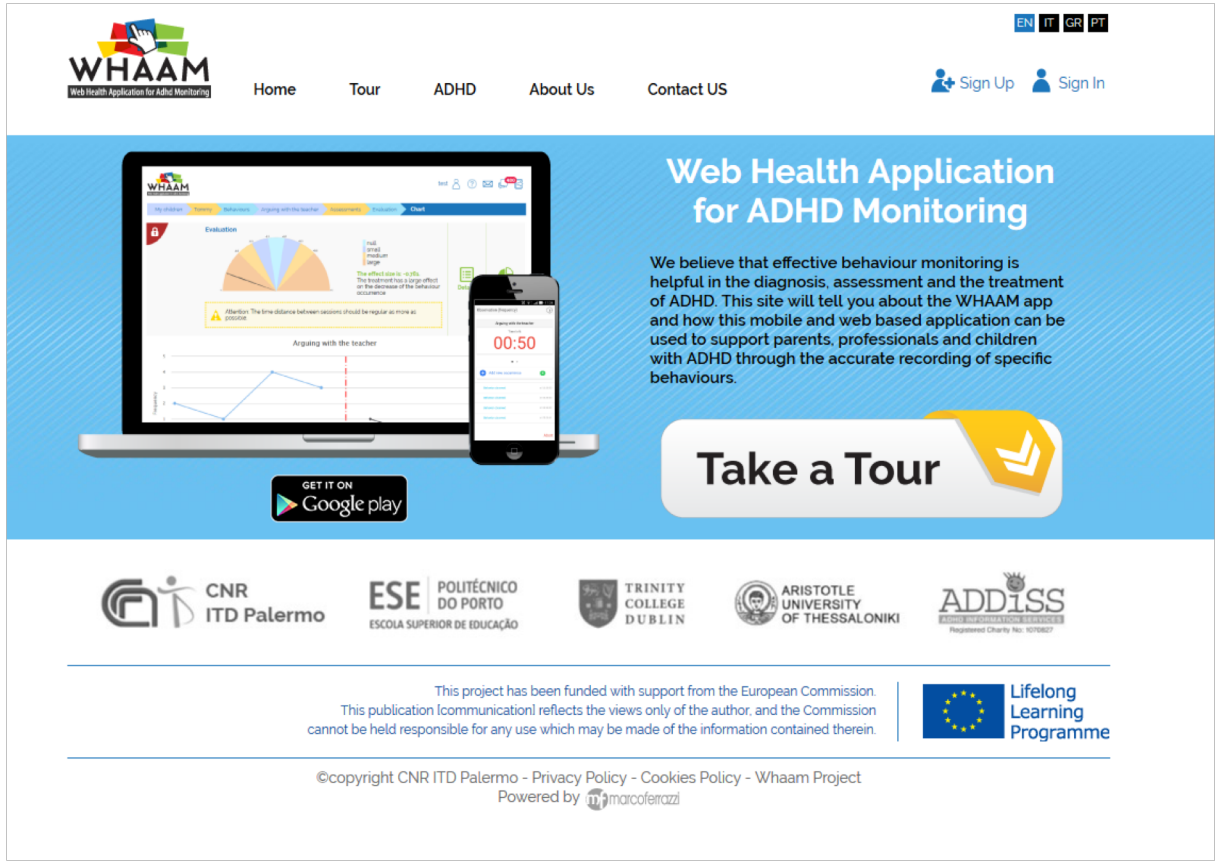
aha.ucd.ie

European projects

BeHave

behaveproject.eu


ONCE UPON
A TIME



The **WHAAM application** was specifically designed to support children with **Attention Deficit Hyperactivity Disorder**

The **WHAAM application** was optimized for **mobile** devices based on **Android** operating systems

WHAAM supported the **Functional Behavior Assessment** approach trying to discover the conditions that **trigger** and **maintain** an unwanted **behavior**.

WHAAM included a **predefined** set of tools:

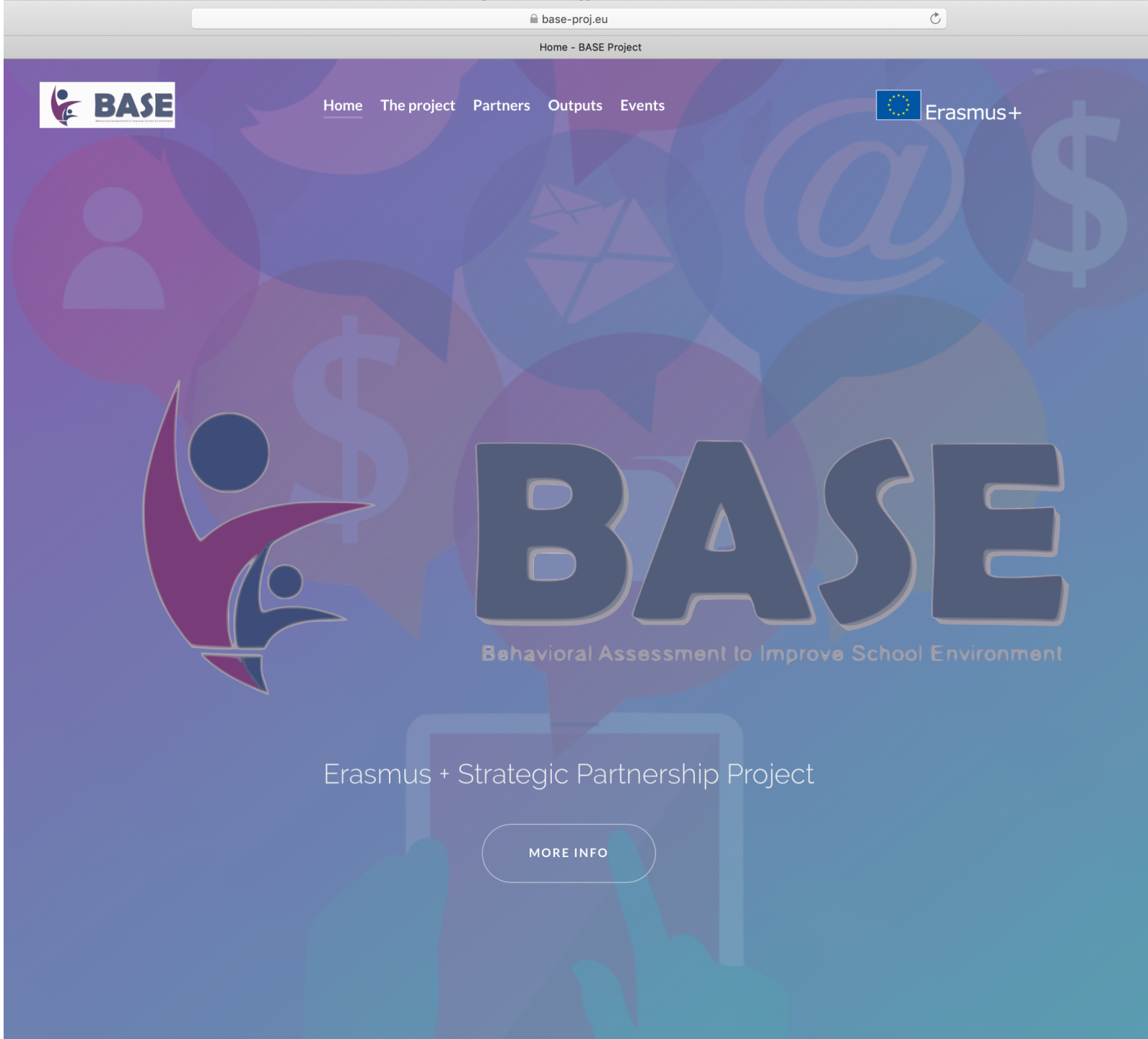
- **Sistematic observation** (frequency + duration)
- **ABCs**

The **WHAAM application** supported only **A-B** designs

The **WHAAM application** analyzed the gathered data only applying the **TAU-U** algorithm

The BASE application

The BASE application is a new Evidence-Based support tool aimed to promote a digitally assisted school-wide intervention, according to the PBIS methodological Framework.



Timeframe

01-09-2017 – 28-02-2019

PARTNERS

- UNIPA
- UNIPORTO
- STICHTNG VU
- UCD DUBLIN

UNIVERSITÀ DEGLI STUDI DI PALERMO

U.A.E.I. UNIDADE DE APOIO À ESCOLA INCLUSIVA

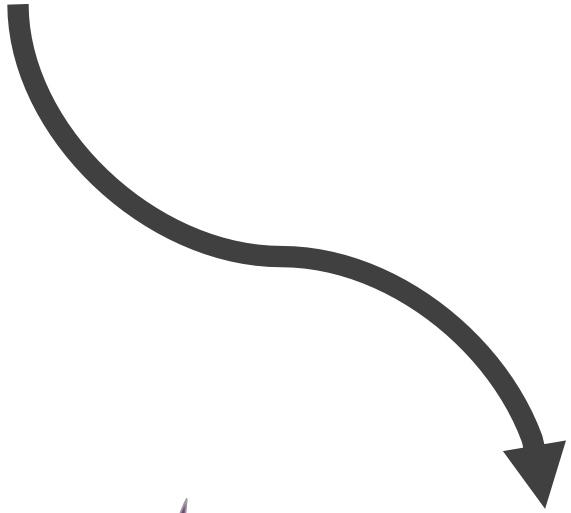
VU VRIJE UNIVERSITEIT AMSTERDAM

UCD DUBLIN

BASE Behavioral Assessment to Improve School Environment

What change from WHAAM to the BASE system (1)

	WHAAM	BASE
User roles	Parents, Teachers, Health professionals	PBS Team members, Teachers, Students, Parents
PBS Tier level support	II, III	I, II, III
Single case design method of observation	AB	AB, ABA, ABAB…
Expectation matrix management support	No	Yes
Composing of different observational tools	No	Yes

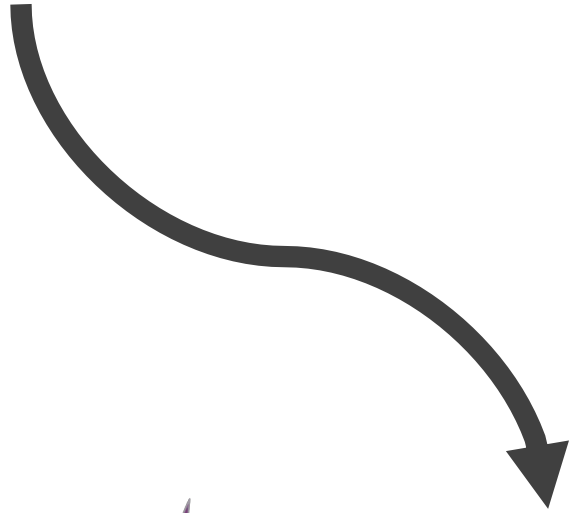


BASE
Behavioral Assessment to Improve School Environment

What change from WHAAM to the BASE system (2)

	WHAAM	BASE
Number of observers	YES Single observer	YES Multiple observer
Tools to evaluate the well-being status of teachers and students	NO	YES
Statistical evaluation of systematic direct observation	TAU-U	TAU-U Allison and Gorman
Reporting and data exportation	YES	YES

WHAAM
Web Health Application for Adhd Monitoring

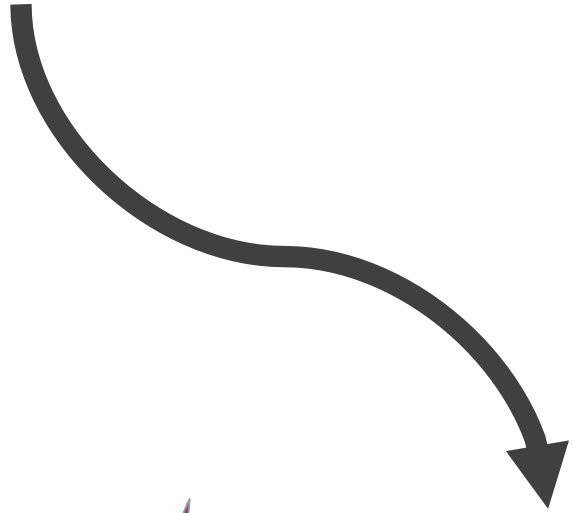


BASE
Behavioral Assessment to Improve School Environment

What change from WHAAM to the BASE system (3)

	WHAAM	BASE
Web Responsive Application	NO	YES
Student as an active user of the system	NO	YES
PBIS teaching and learning support	NO	YES (Repository)
Open source	YES	YES

WHAAM
Web Health Application for Adhd Monitoring



BASE
Behavioral Assessment to Improve School Environment

Features

Core functionalities

- Creation and management of the Matrix of Expectations
- Creation of the list of Minor and Major behavioural violations
- Creation of CICO and collection of the related data
- Reinforcement mechanism through token economy in order to promote and reward the student's positive behaviours in CICO system
- Multiple Single-Subject Designs (AB, ABA, ABAB, etc.)
  - Planning of a period of observation, assignment to an observer and submitting of the observation tool

BASE
Behavioral Assessment to Improve School Environment

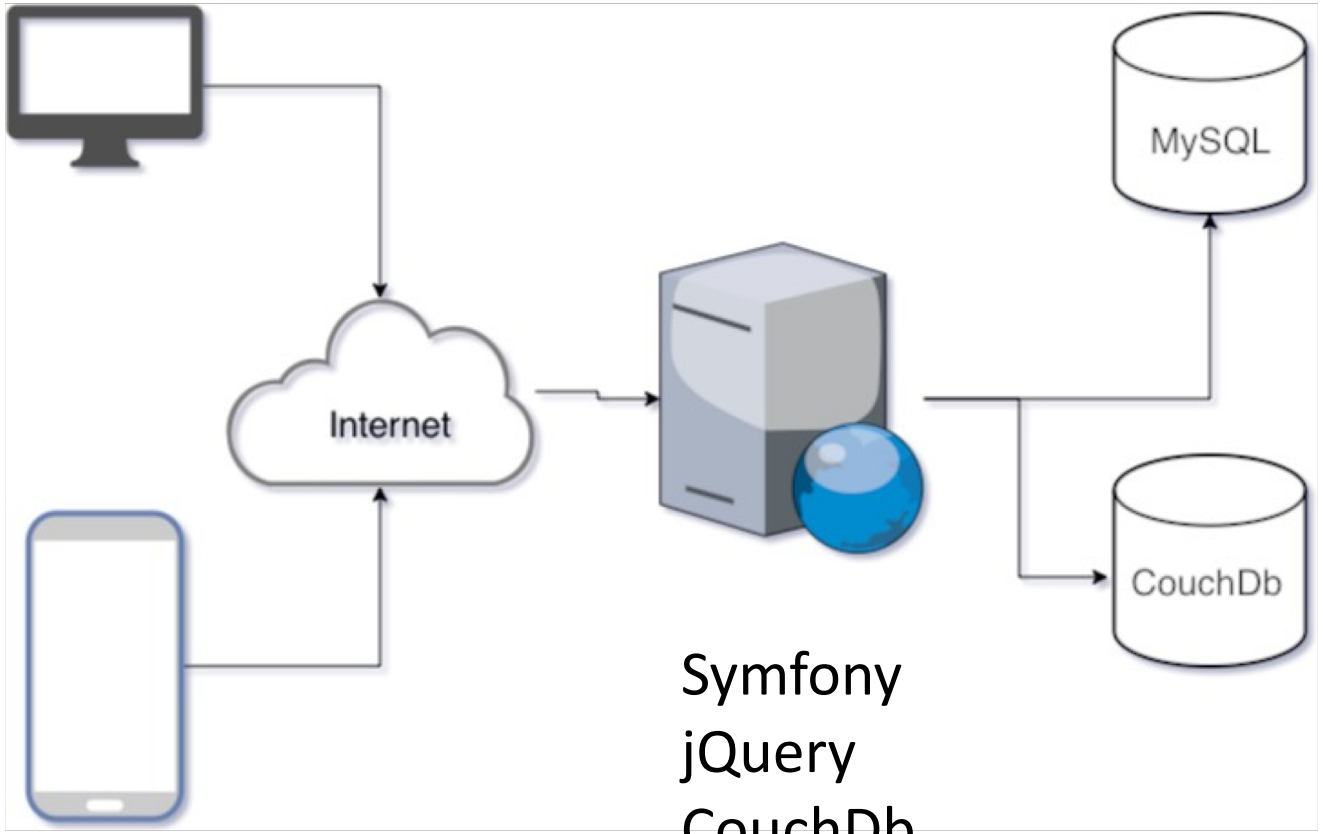
Features

Core functionalities

- Creation of an observation tool like:
  - Measurement tools to evaluate the well-being of teachers and student (i.e. rating scales, emotional thermometer)
  - Screening tool based on the Matrix of Expectations' values in order to identify the behaviours at risk (SWPBS)
  - Digital management of ODRs
- Gather observational data related to a behaviour
- Statistical evaluation of an observation

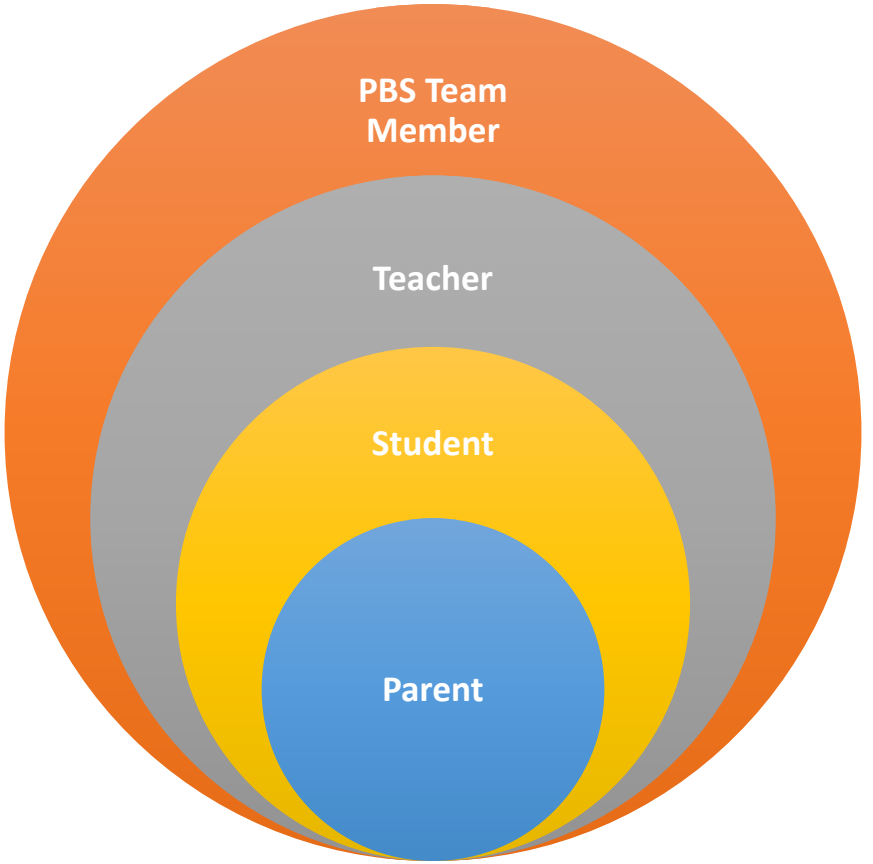
BASE
Behavioral Assessment to Improve School Environment

BASE Web application architecture



Symfony
jQuery
CouchDb
Bootstrap

BASE
Behavioral Assessment to Improve School Environment



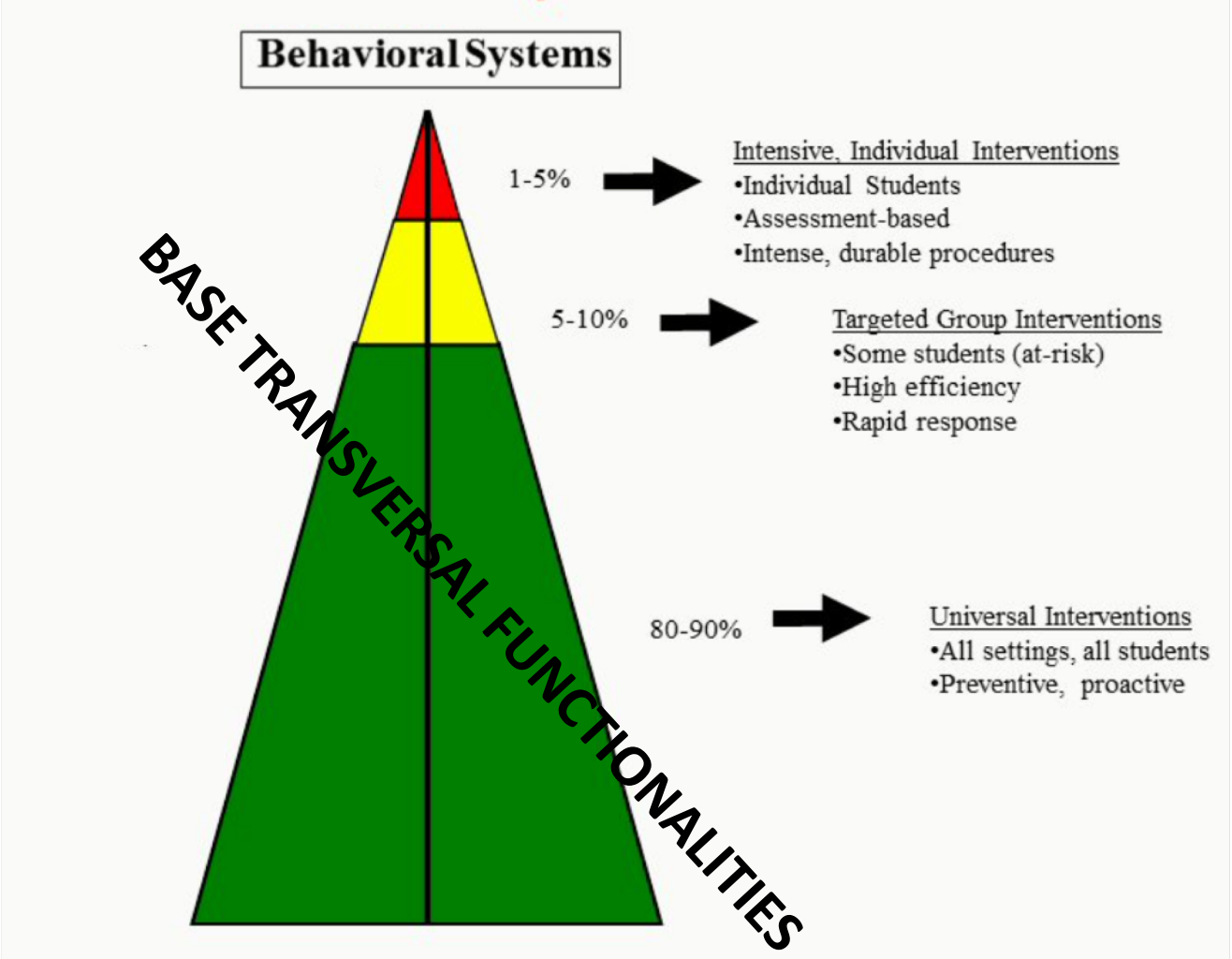
User Roles of BASE application

BASE
Behavioral Assessment to Improve School Environment

The PBIS key principles supported by the BASE System

A versatile system able to provides transversal functionalities at the three levels of PBIS implementation

Three levels of implementation



The PBS key principles supported by the BASE System

Support the creation and management of the PBS School Leadership Team

Roles involved

BASE
Behavioral Assessment to Improve School Environment

School Leadership Team Member is able to:

- have complete view of the school's data
- assign a teacher coordinator for each classroom
- access to the data of each classroom
- create measurement tools for the behavioural observation and assign it to an observer (such as ODRs, Positive Behaviour Cards, Screening tools, etc.)
- create and to manage the Matrix of Expectation
- set up a CICO monitoring tool
- create and to manage the list of Minor and Major behaviours

The PBS key principles supported by the BASE System

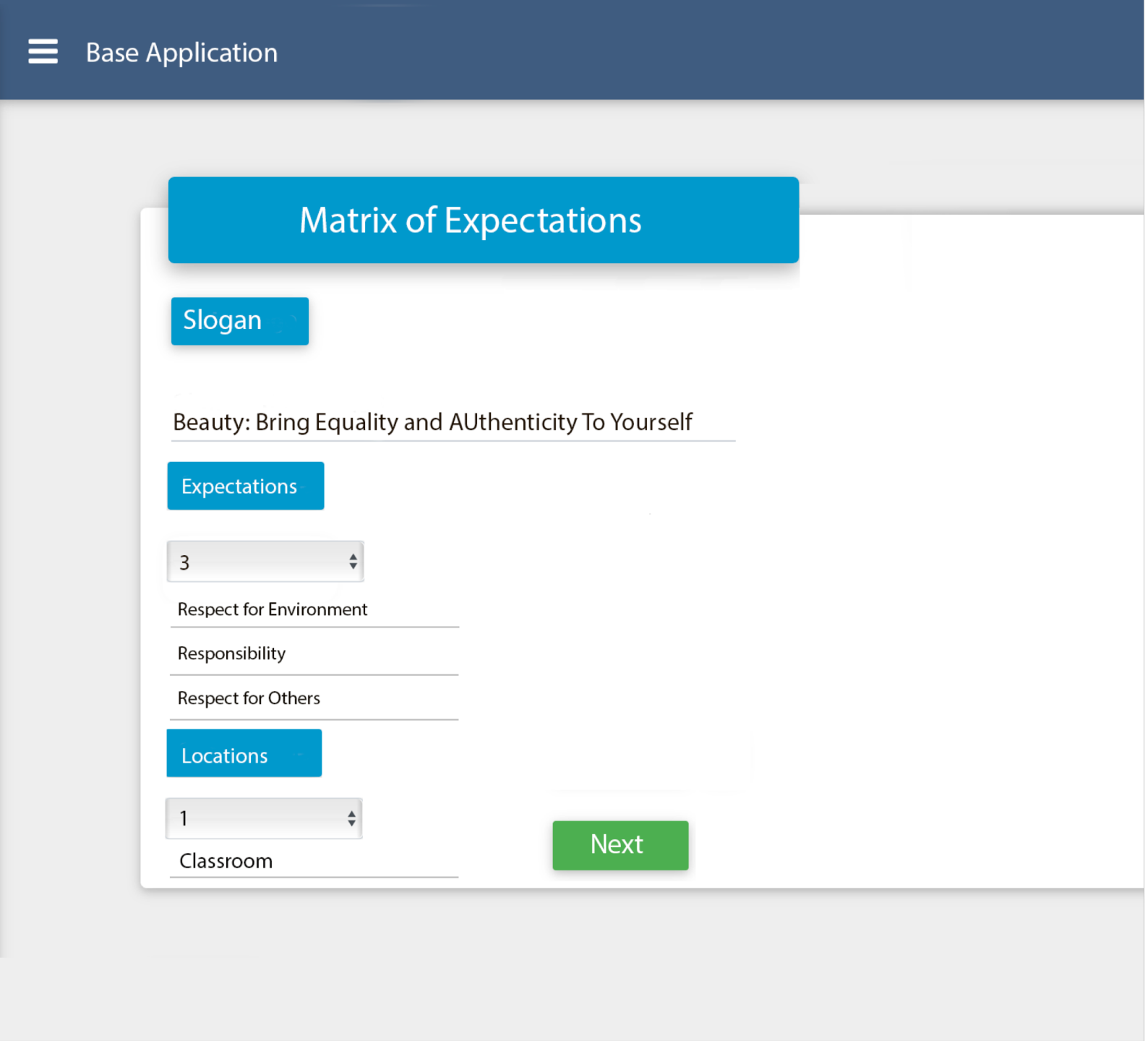
The creation of the expectation matrix has a key role in the promotion, learning and sharing of school values

Image source: http://www.bild.org.uk/our-services/events/pbscoachesinschools/

1. Define the name of Matrix (slogan)
2. Insert the number of expectations
3. Insert the number of locations
4. Put the expectations in the matrix
5. Put the locations in the matrix
6. Add the behaviours for expectations and locations

The BASE creation process of Expectation Matrix

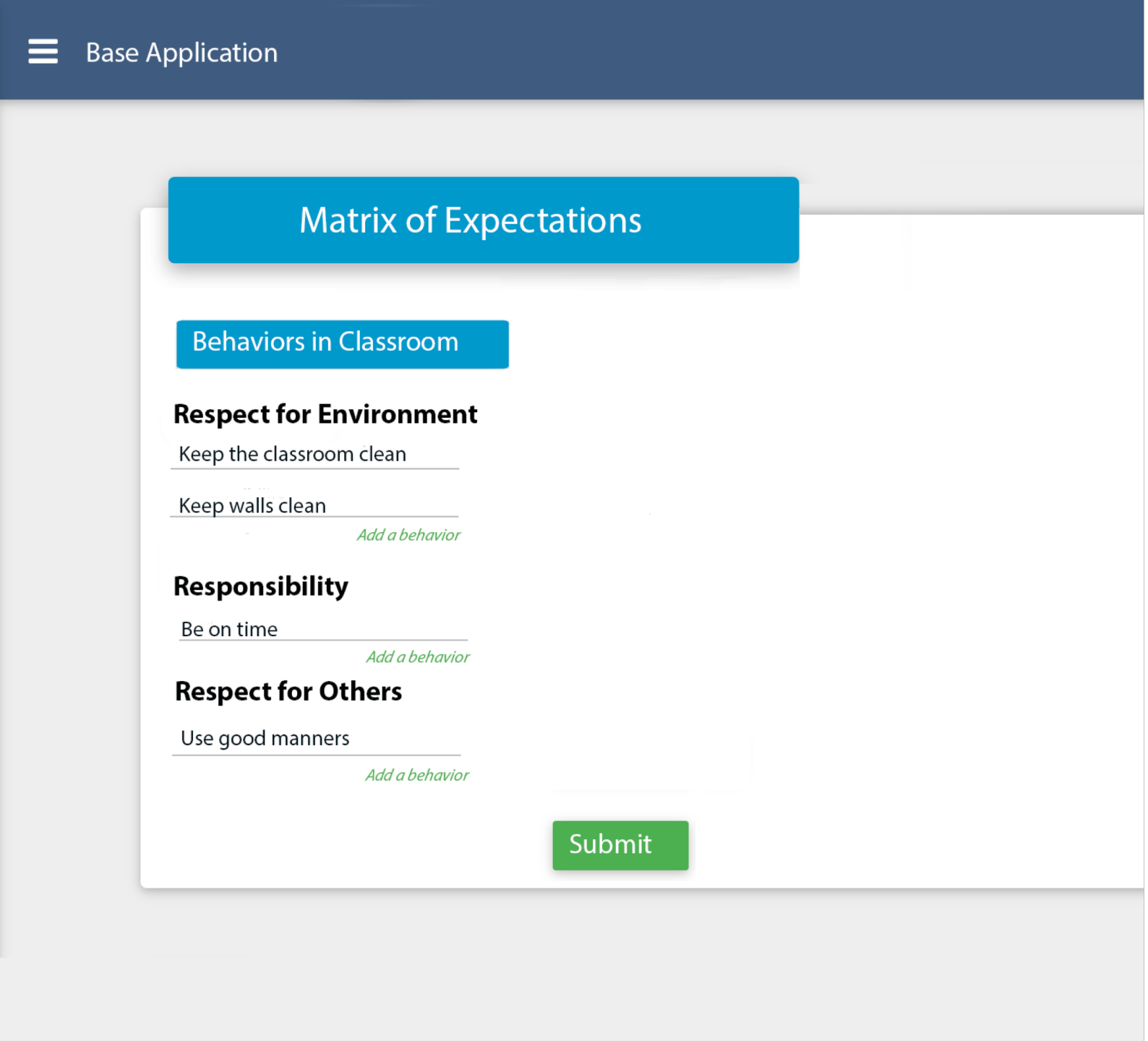
BASE
Behavioral Assessment to Improve School Environment



Creation of Matrix Step 1

1. Define the name of Matrix (slogan)
2. Insert the number of expectations
3. Insert the number of locations
4. Put the expectations in the matrix
5. Put the locations in the matrix

BASE
Behavioral Assessment to Improve School Environment



Creation of Matrix Step 2

6 Add the behaviours for expectation and location

BASE
Behavioral Assessment to Improve School Environment

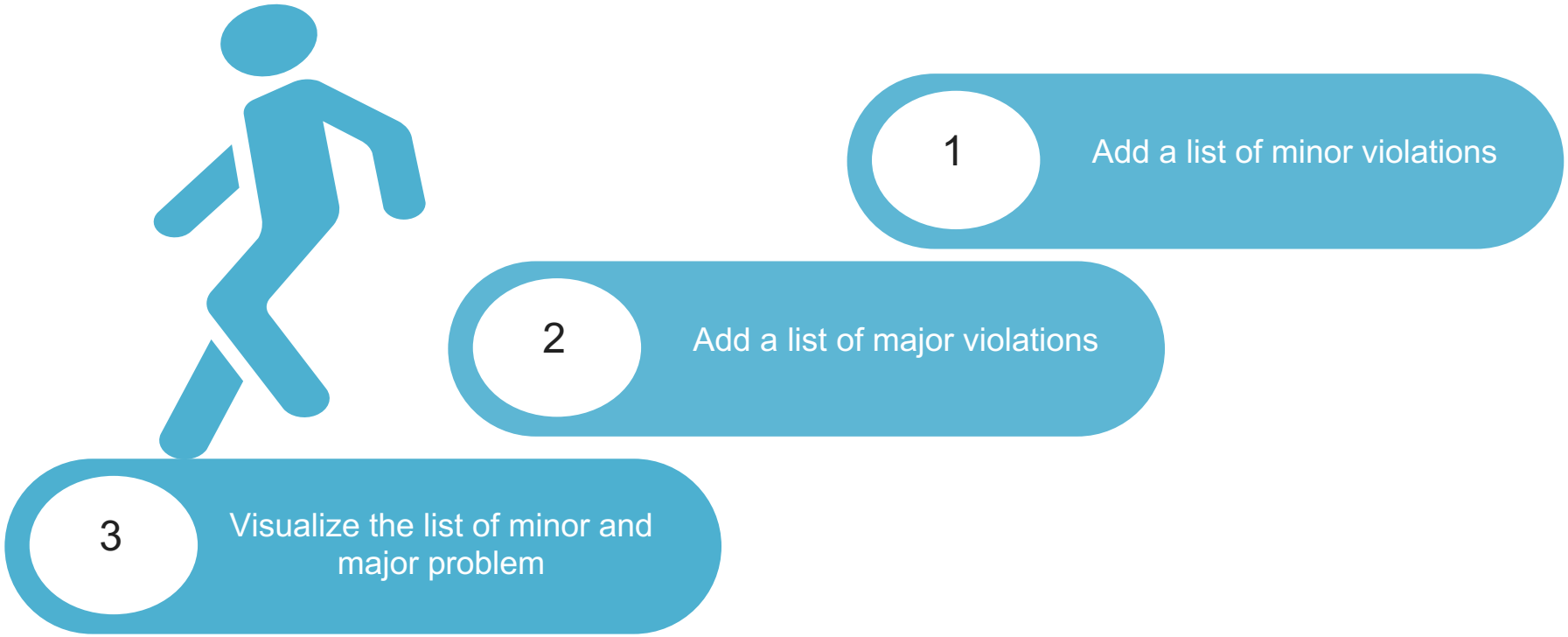
Matrix of Expectations

Beauty: Bring Equality and AUthenticity To Yourself

Expectations Locations	RESPECT FOR ENVIRONMENT	RESPONSIBILITY	RESPECT FOR OTHERS
CLASSROOM	*Keep the classroom clean* *Keep walls clean*	*Be on time* *Listen attentively to teachers and respond appropriately*	*Use good manners* *Listen when it's someone else's turn to speak*

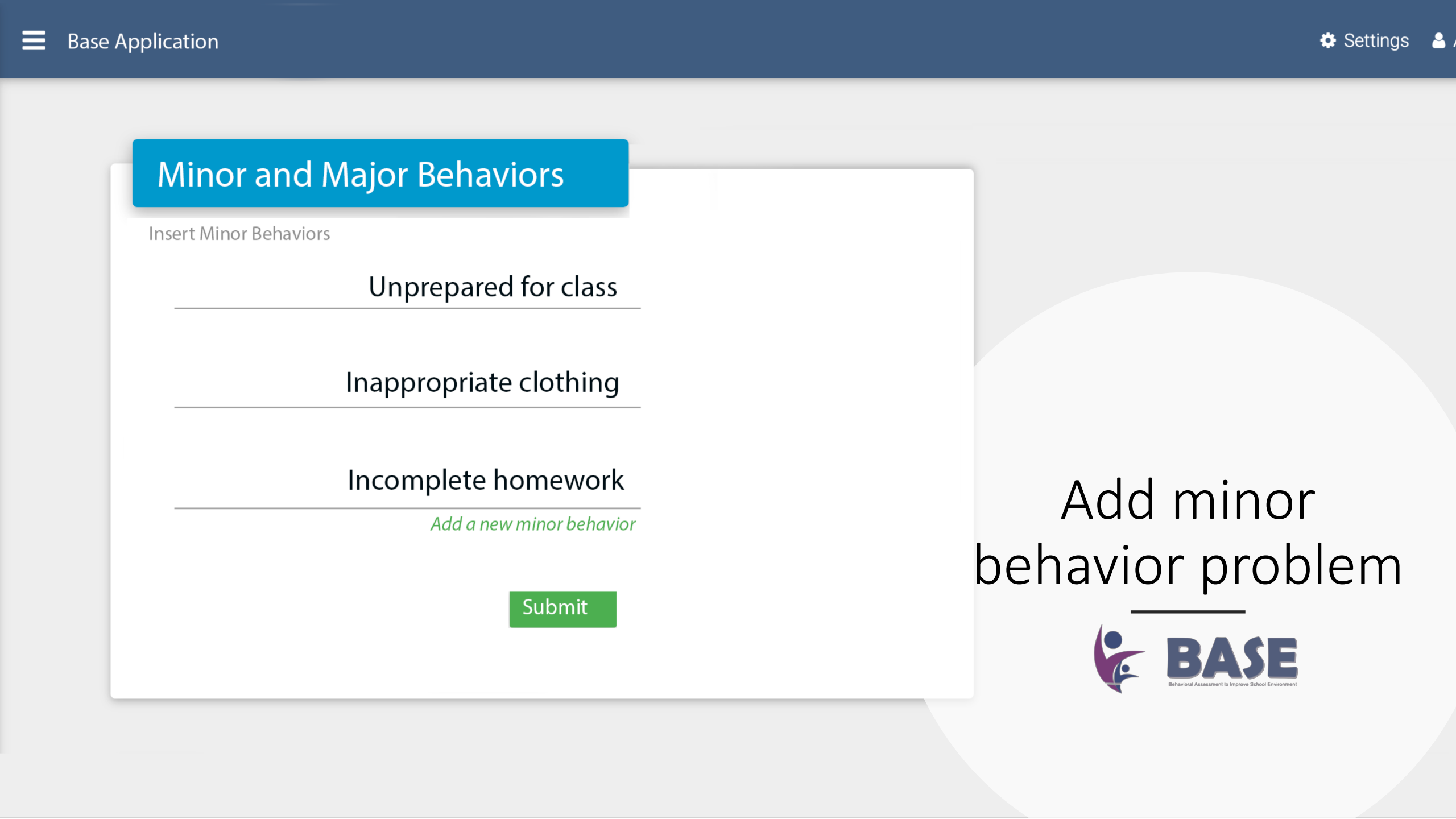
Visualisation of matrix

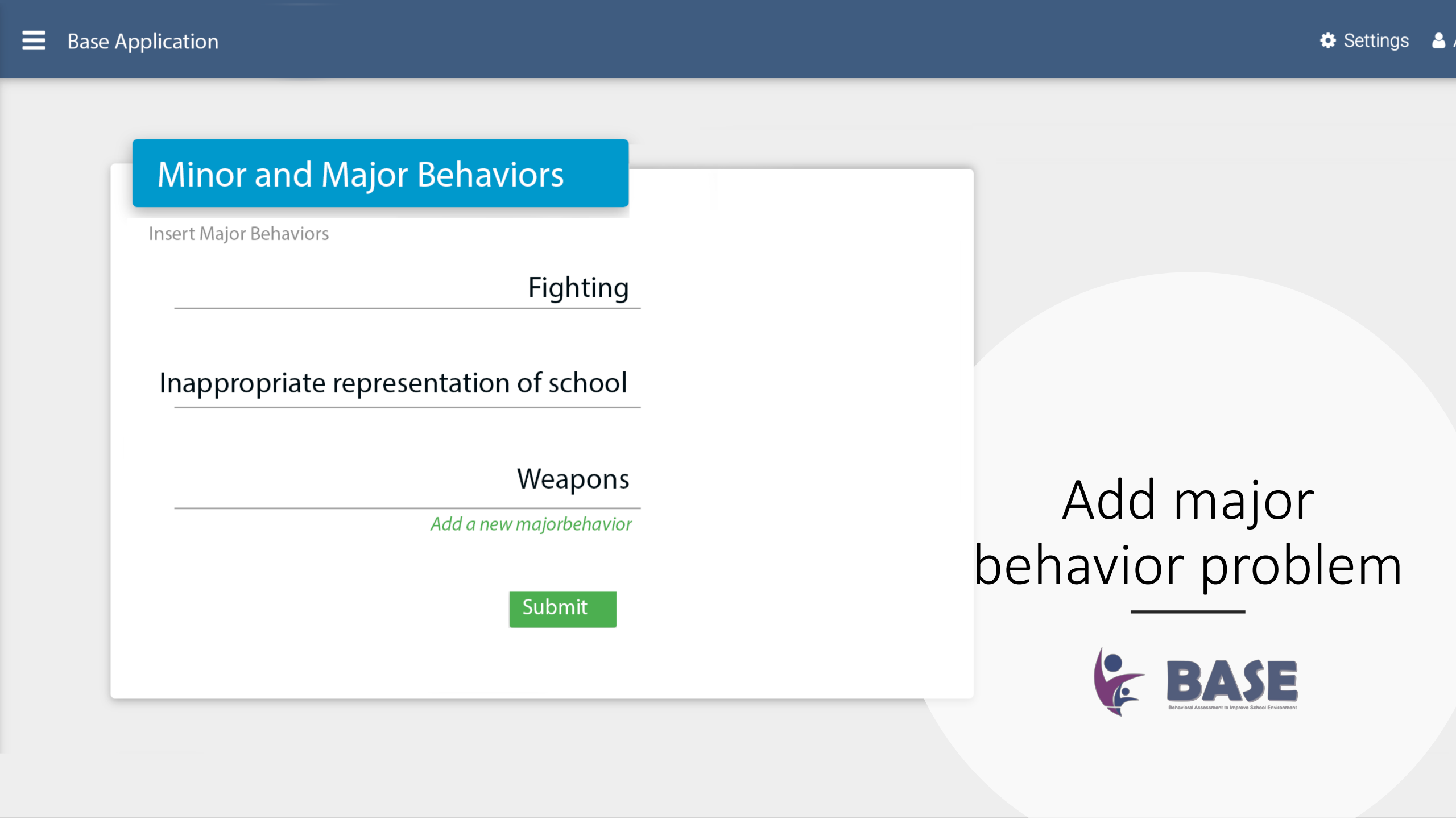
BASE
Behavioral Assessment to Improve School Environment



The BASE creation process of Minor and Major problems

BASE
Behavioral Assessment to Improve School Environment


Base Application
Settings
Minor and Major Behaviors
Insert Minor Behaviors
Unprepared for class
Inappropriate clothing
Incomplete homework
Add a new minor behavior
Submit
Add minor behavior problem
BASE
Behavioral Assessment to Improve School Environment



Add major behavior problem

BASE
Behavioral Assessment to Improve School Environment

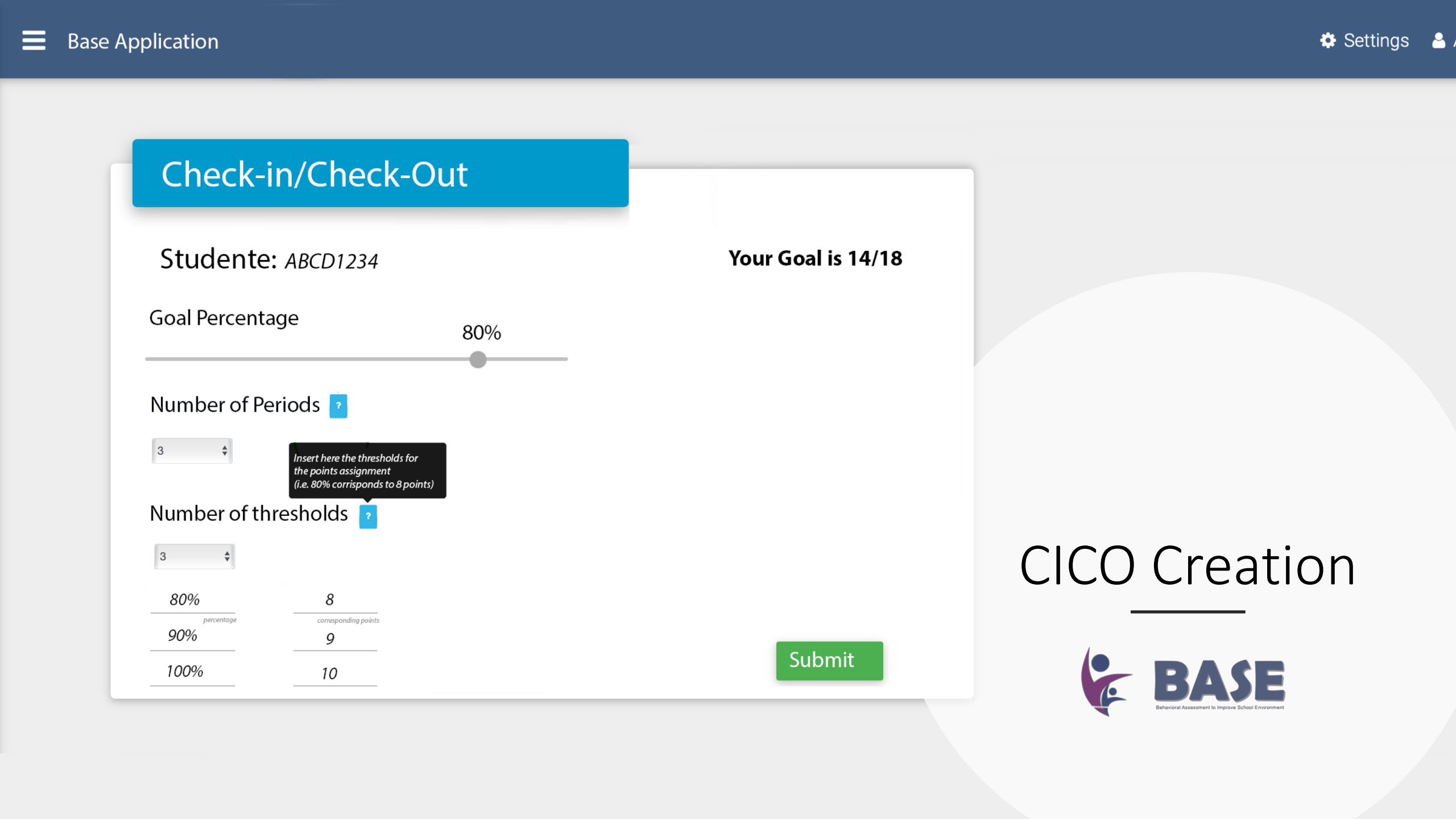
Minor and Major Behaviors

Minor Behaviors	Major Behaviors
Unprepared for class	Fighting
Inappropriate clothing	Inappropriate representation of school
Incomplete homework	Weapons

Add other behaviors

Visualisation of Minor and Major problem

BASE
Behavioral Assessment to Improve School Environment

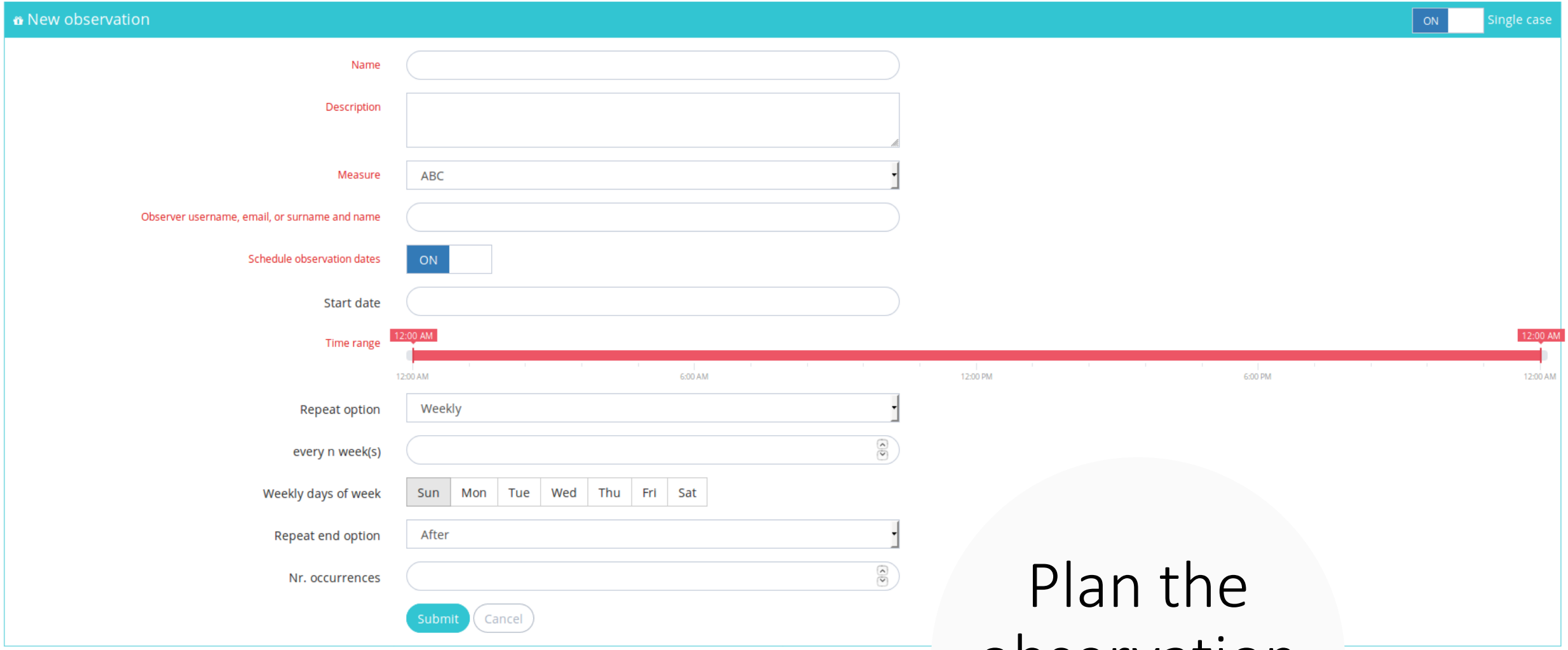


CICO Creation

BASE
Behavioral Assessment to Improve School Environment

1. Select a student to observe
2. Build the measure
3. Plan the observation
4. Gather data
5. Label phases and data
6. Analyze data

The creation of measurement and observation process in BASE

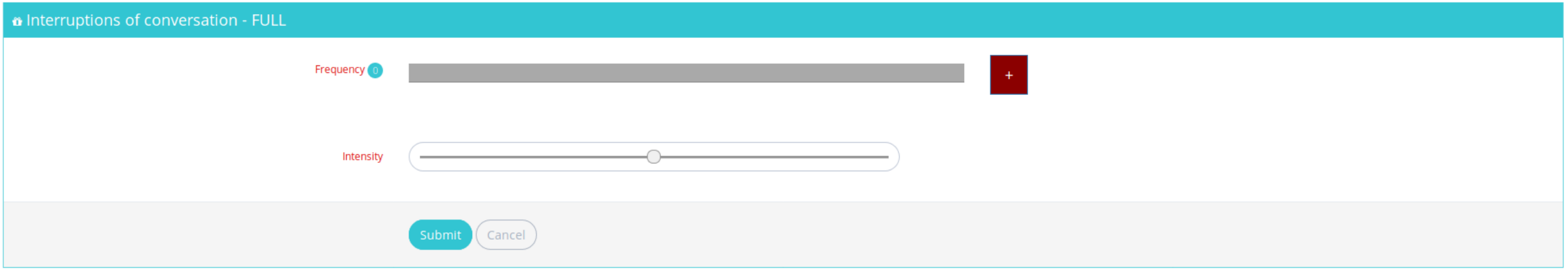


Plan the observation

BASE

Behavioral Assessment to Improve School Environment

Data gathering about Anthony (full)



Gather data

BASE
Behavioral Assessment to Improve School Environment

PHASES TO BE COMPARED

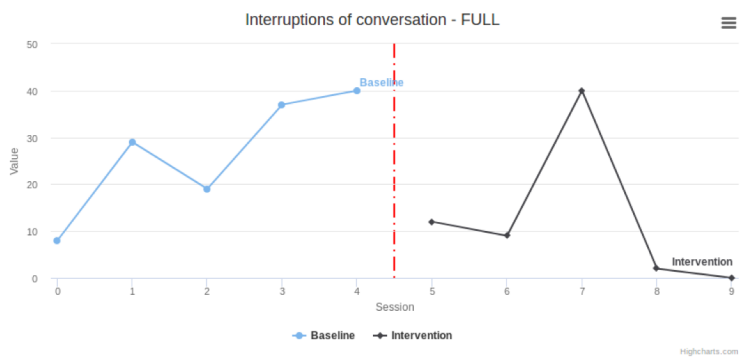
Statistical Index

1 BASELINE 5 observations | 2 INTERVENTION 5 observations | 3 FOLLOW UP 5 observations

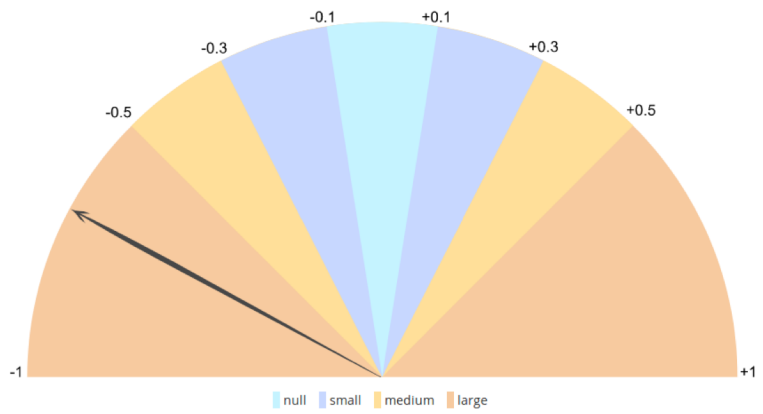
ITEM BE ANALYZED

1 FREQUENCY | 2 INTENSITY

SCATTER PLOT



SPEEDOMETER: AVSB



The effect size is: -0.684.
The treatment has a large effect on the decrease of the behaviour occurrence

PARKER'S TAU-U Partition and Full Matrices

	TREND A	TREND B	FULL MATRIX
n pairs	10	10	45
n pos	9	2	17
n neg	1	8	27
S	8	-6	-10
Tau	0.8	-0.6	-0.222
SDs	4.082	4.082	11.136
VaRs	16.667	16.667	124
Z	1.96	-1.47	-0.898
p(Z based)	0.05	0.142	0.369
r Effect Size	0.952	-0.809	-0.341

TAU_U ANALYSIS

	A vs B	A vs B + TREND B	A vs B + TREND B - TREND A
n pairs	25	35	45
n pos	6	8	9
n neg	18	26	35
S	-12	-18	-26
Tau	-0.48	-0.514	-0.578
SDs	9.545	10.371	11.136
VaRs	91.111	107.56	124
Z	-1.257	-1.736	-2.335
p(Z based)	0.209	0.083	0.02
r Effect Size	-0.684	-0.722	-0.788

Analyze data

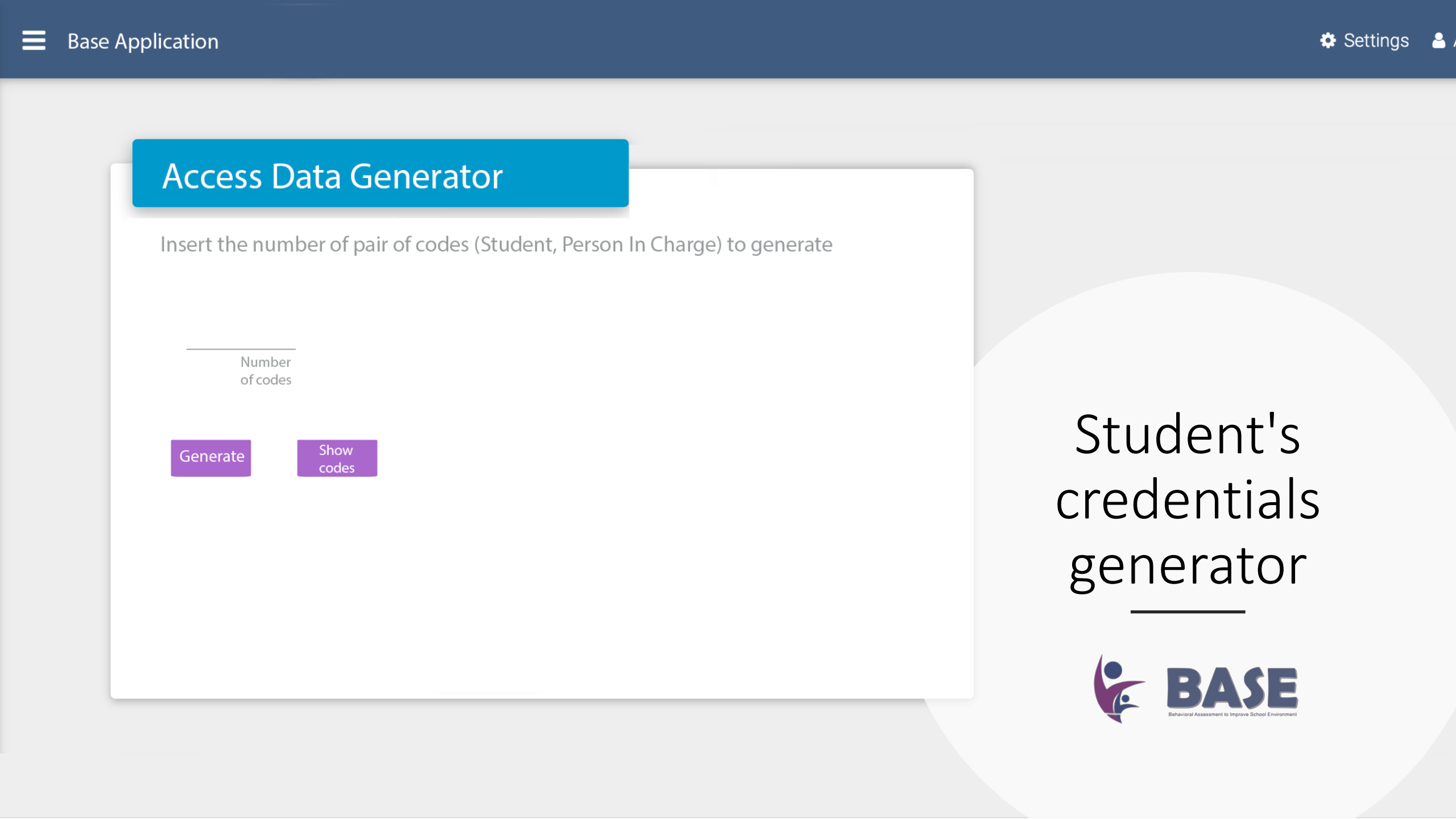
BASE
Behavioral Assessment to Improve School Environment

Roles involved

BASE
Behavioral Assessment to Improve School Environment

Teacher is able to:

- create a classroom group adding students and parents (if he is the classroom coordinator)
- generate an anonymous access code for students and parents (teacher coordinator)
- gather observational data (for instance from CICO)
- make an ODR
- access the observational data report of each student


Base Application
Settings
Access Data Generator
Insert the number of pair of codes (Student, Person In Charge) to generate
Number of codes
Generate
Show codes
Student's credentials generator
BASE
Behavioral Assessment to Improve School Environment

Base Application

Settings

Access Data Generator

Student

ABCD1234
Butterfly195

A0ACE694
Eagle950

E9DAE521
Dove624

Person in charge

A1B1C1D1

ABC123D4

AB12CD34

Add codes

Student's credentials generator

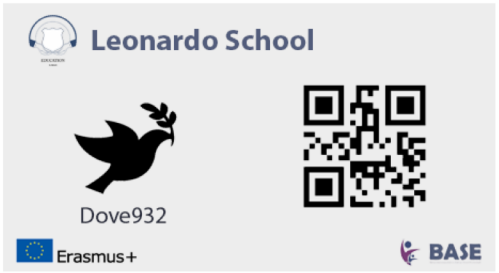
BASE
Behavioral Assessment to Improve School Environment

Base Application

Settings

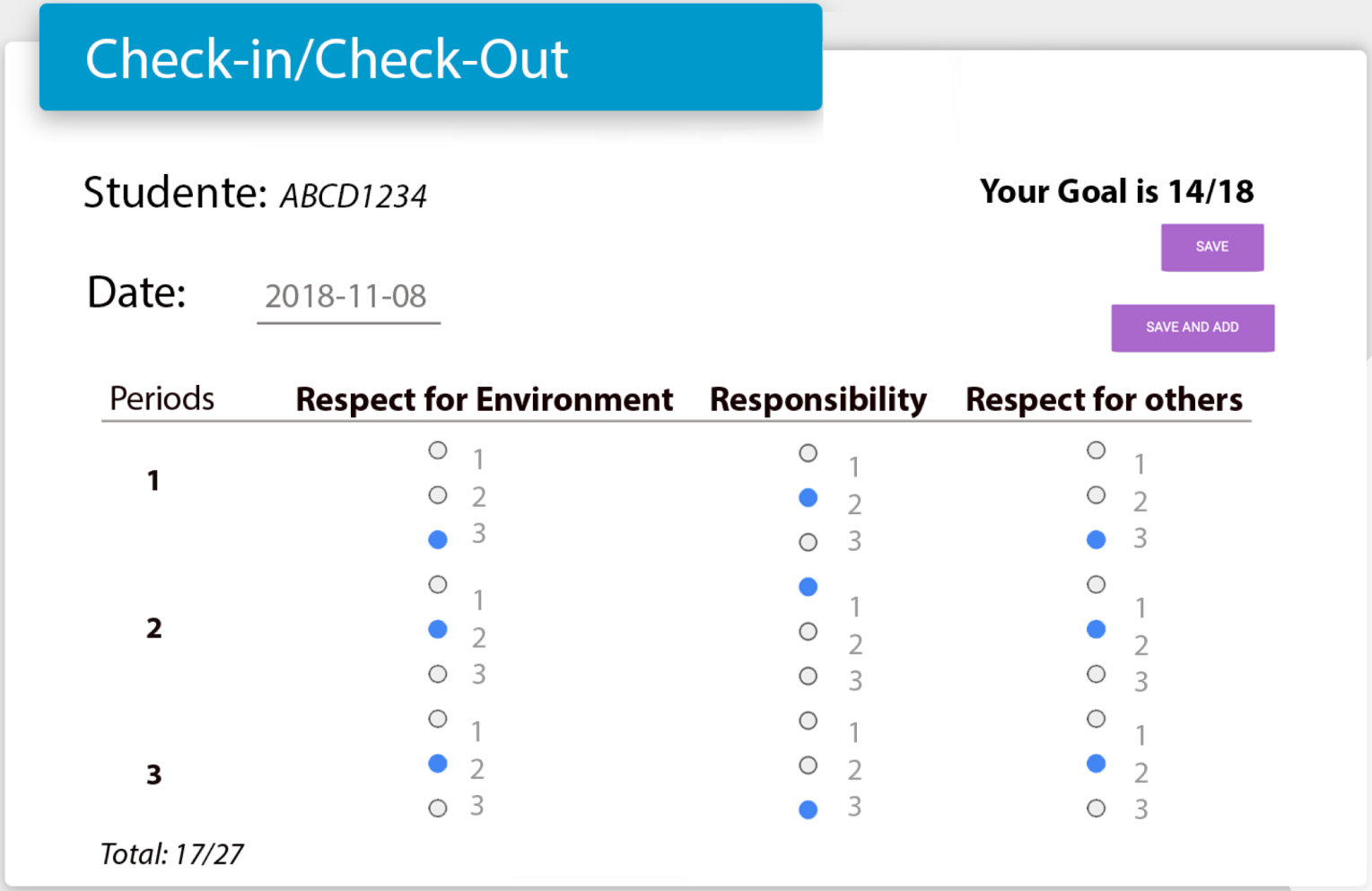
Access Cards

Print Cards



Student's QR code access card

BASE
Behavioral Assessment to Improve School Environment



CICO Compilation

BASE
Behavioral Assessment to Improve School Environment

Application

Settings Account

CICO Session

Date range

From

2018-11-08

To

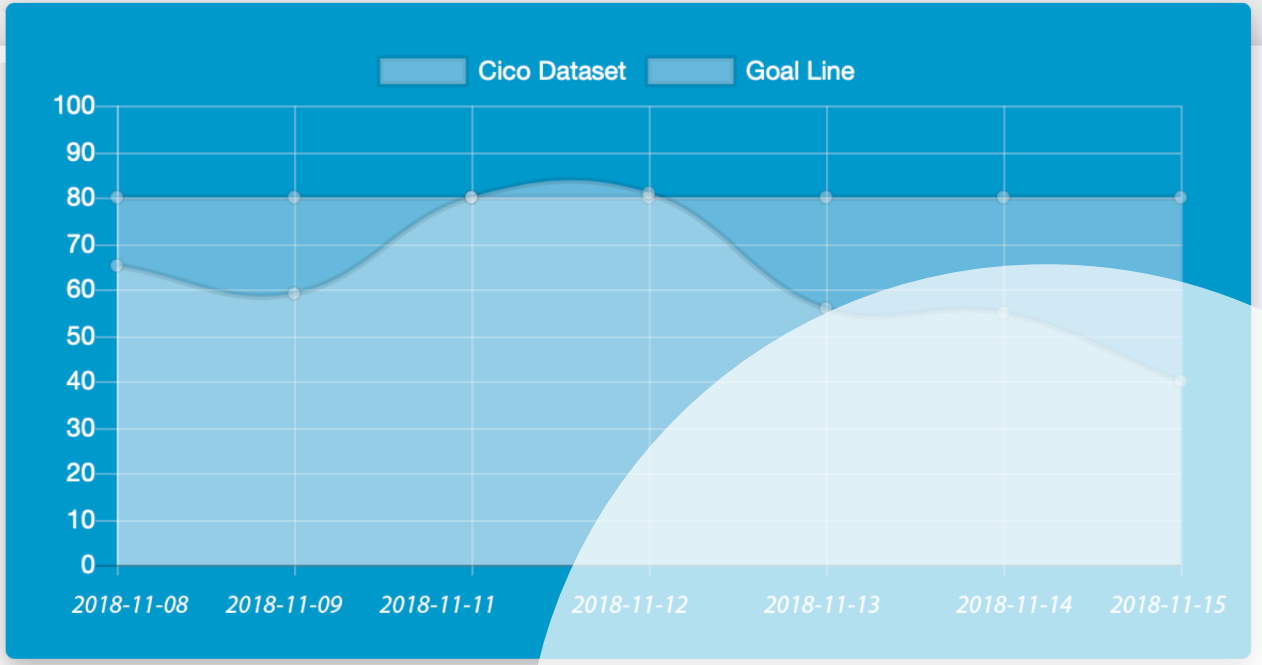
2018-11-15

Available points: **24** ?

Average value : **63** ?

80%

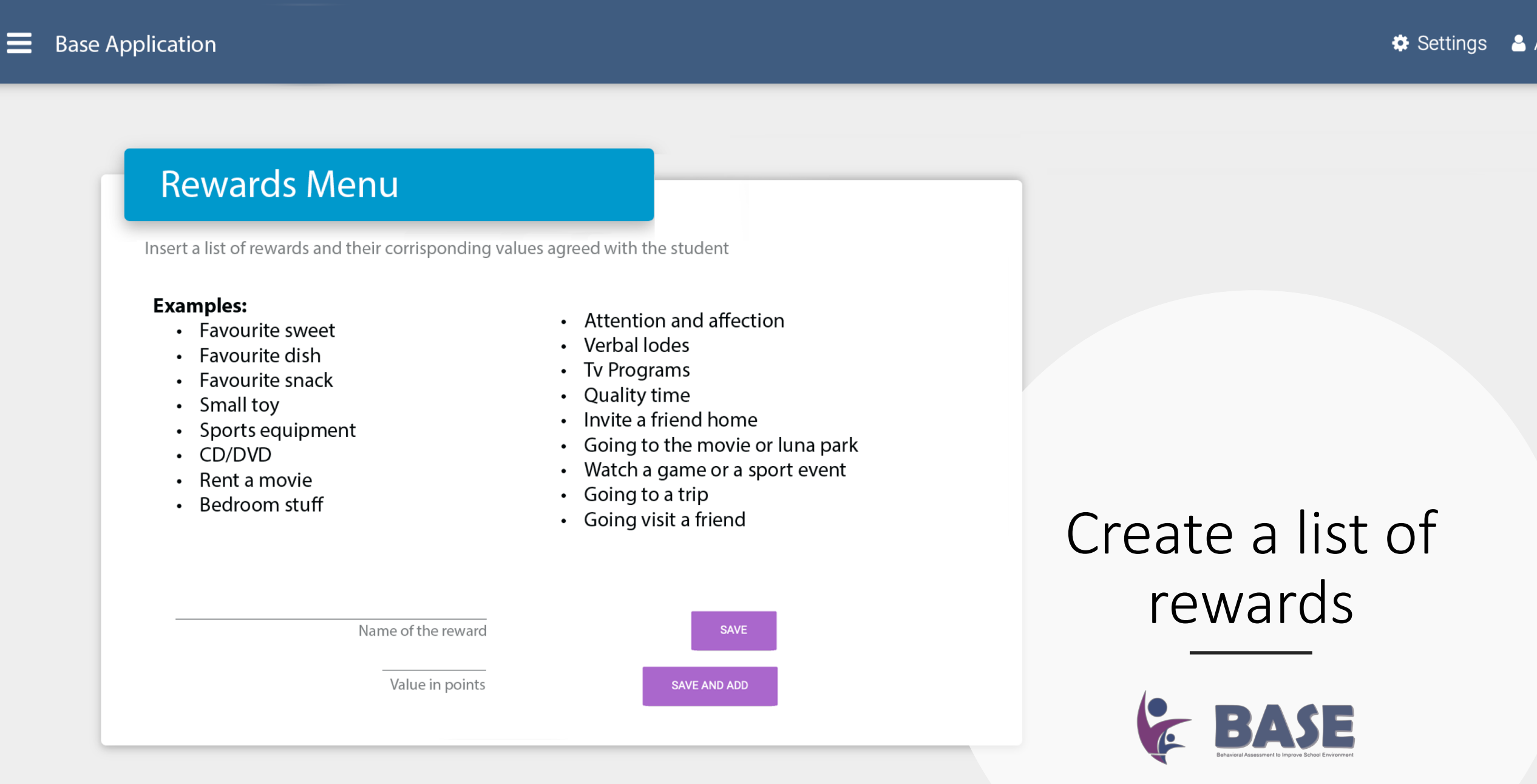
Goal Percentage



CICO report

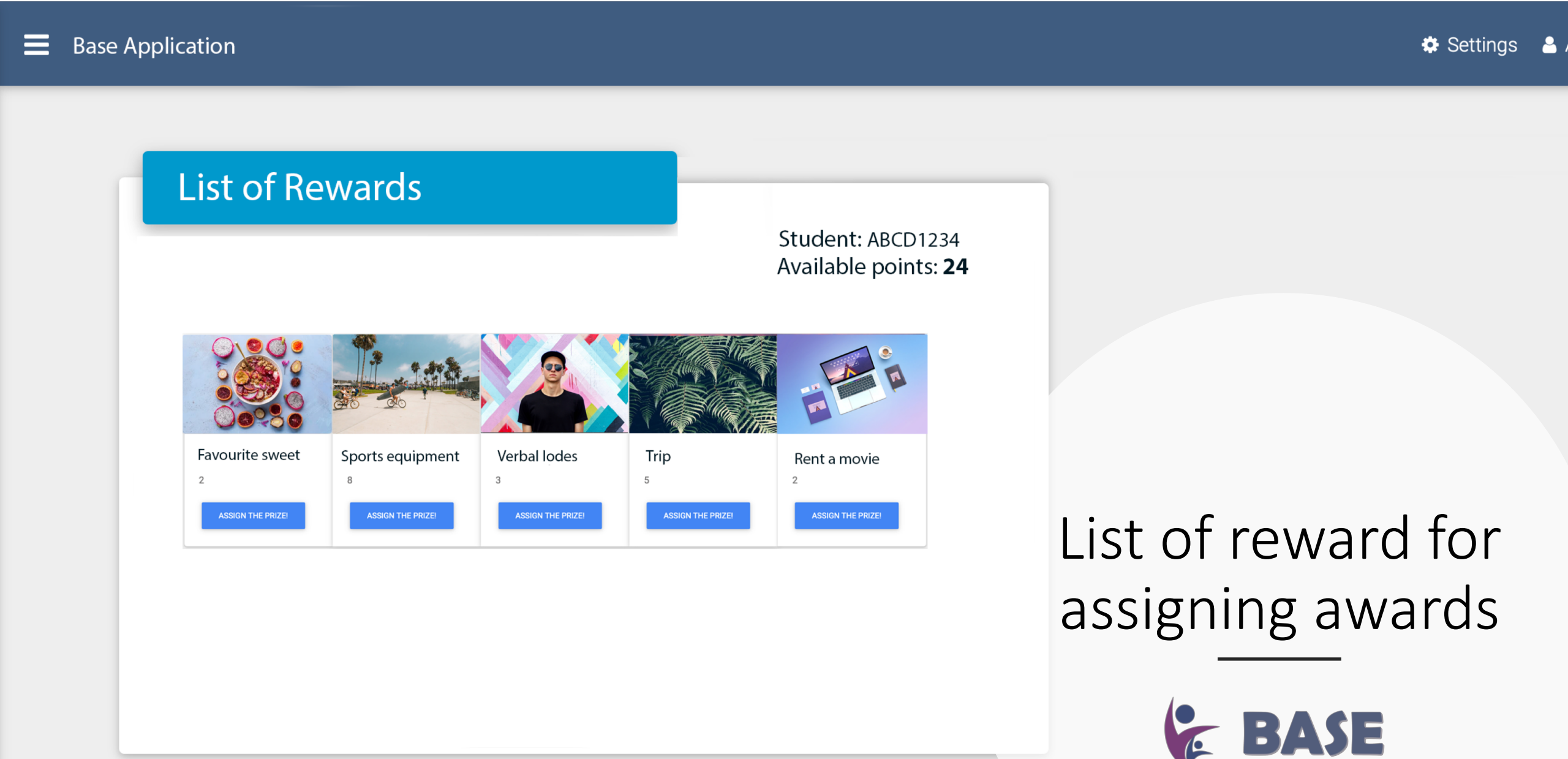
STUDENT: ABCD1234

BASE
Behavioral Assessment to Improve School Environment



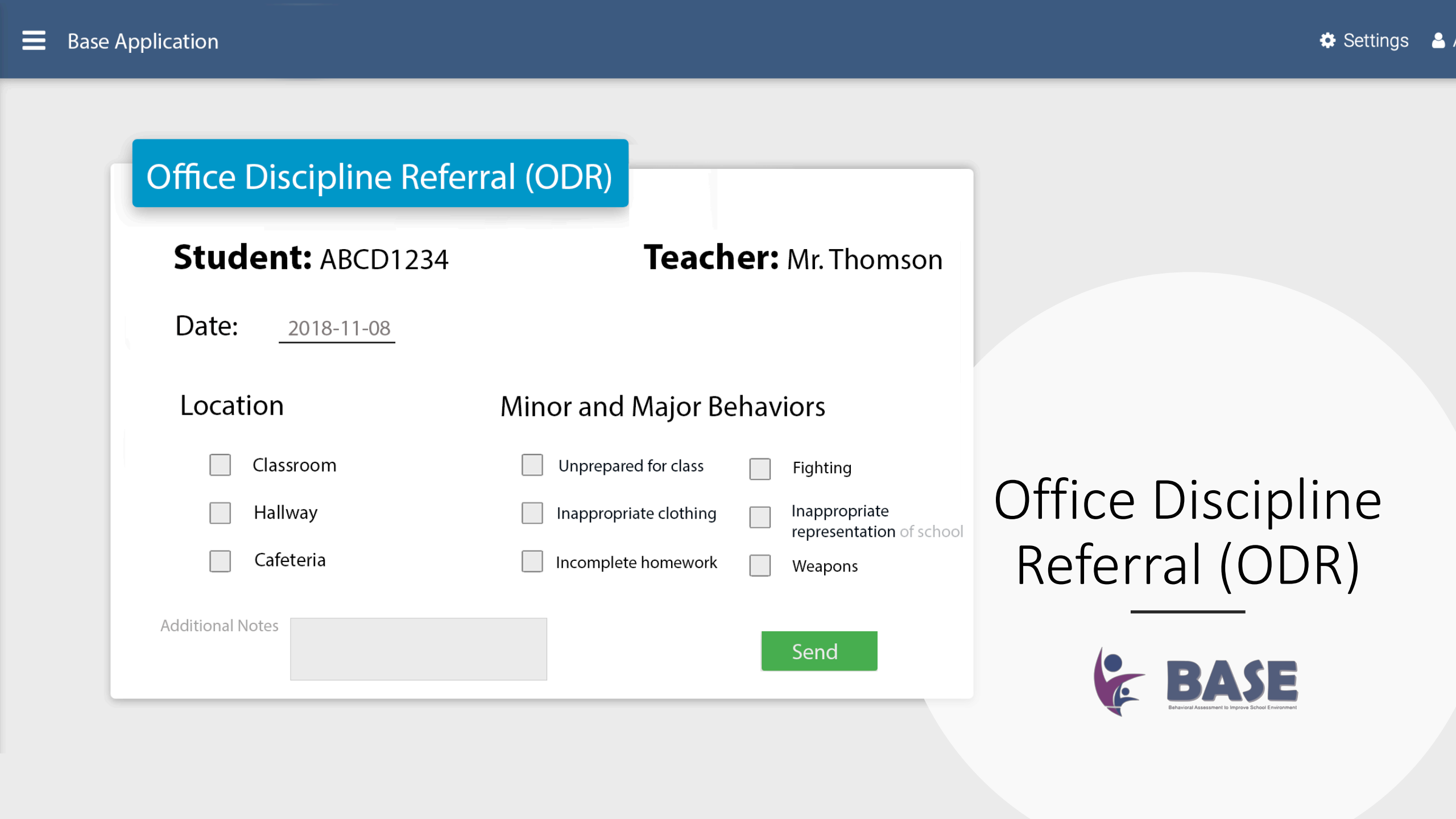
Create a list of rewards

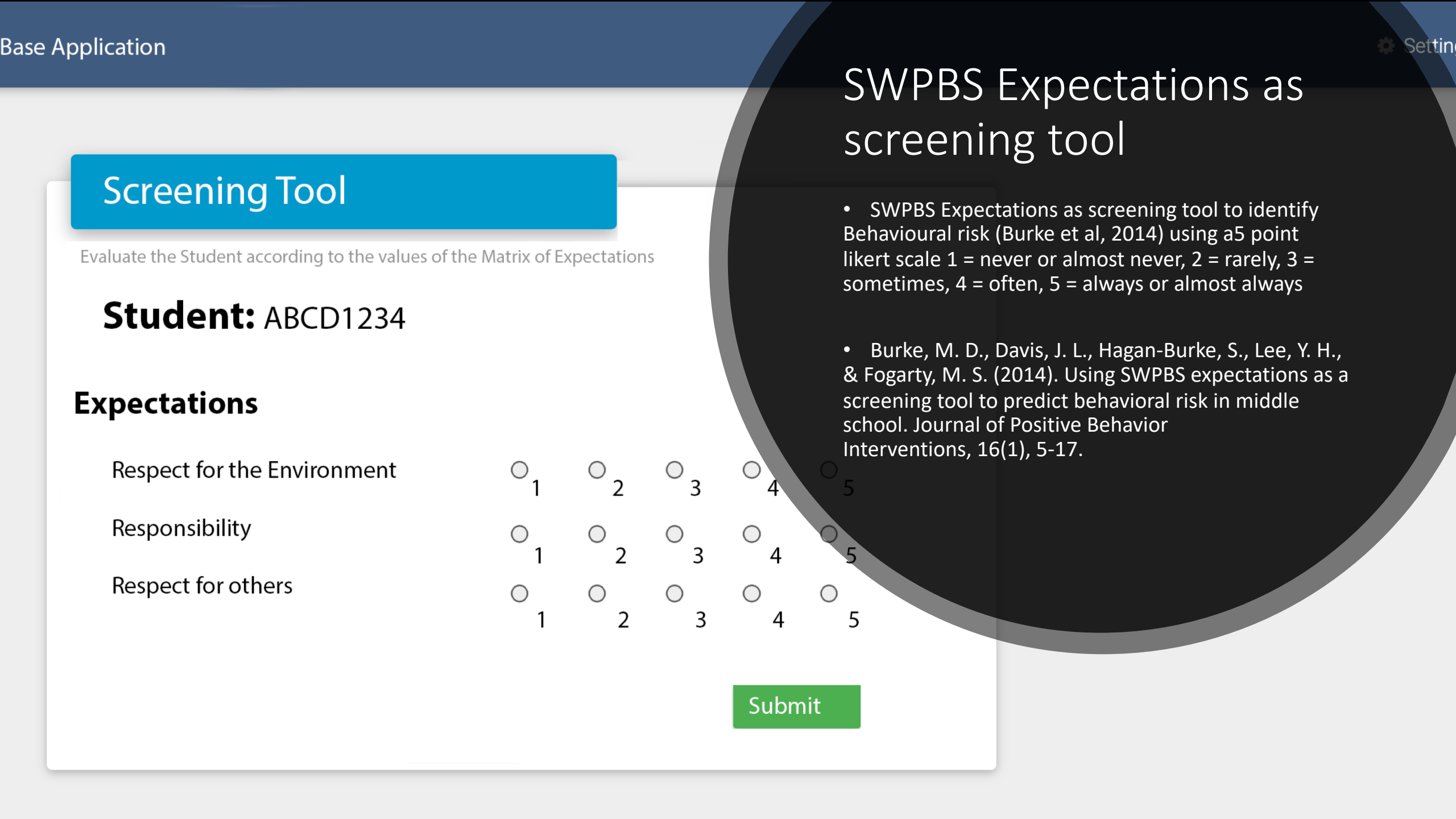
BASE
Behavioral Assessment to Improve School Environment



List of reward for assigning awards

BASE
Behavioral Assessment to Improve School Environment


Base Application
Settings
Office Discipline Referral (ODR)
Student: ABCD1234
Teacher: Mr. Thomson
Date: 2018-11-08
Location
Classroom
Hallway
Cafeteria
Minor and Major Behaviors
Unprepared for class
Inappropriate clothing
Incomplete homework
Fighting
Inappropriate representation of school
Weapons
Additional Notes
Send
Office Discipline Referral (ODR)
BASE
Behavioral Assessment to Improve School Environment



SWPBS Expectations as screening tool

- SWPBS Expectations as screening tool to identify Behavioural risk (Burke et al, 2014) using a5 point likert scale 1 = never or almost never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always or almost always

- Burke, M. D., Davis, J. L., Hagan-Burke, S., Lee, Y. H., & Fogarty, M. S. (2014). Using SWPBS expectations as a screening tool to predict behavioral risk in middle school. Journal of Positive Behavior Interventions, 16(1), 5-17.

Roles involved

Student:

- Logs in using a QR Code or a personal code
- Is able to check his personal scoreboard

Parent:

- Logs in using a QR Code or a personal code
- Is able to monitor his child's behavior at school

BASE
Behavioral Assessment to Improve School Environment

BASE

Behavioral Assessment to Improve School Environment

Giuseppe Chiazzese

Antonella Chifari

Gianlca Merlo

Web site: baseproj.eu

Email: base@itd.cnr.it