

DECART: Designing higher Education Curricula for Agility, Resilience & Transformation

Train the trainers: A serious game SUCRE for “building resilient curricula”.

Deliverable R23

version 2.0, October 2025



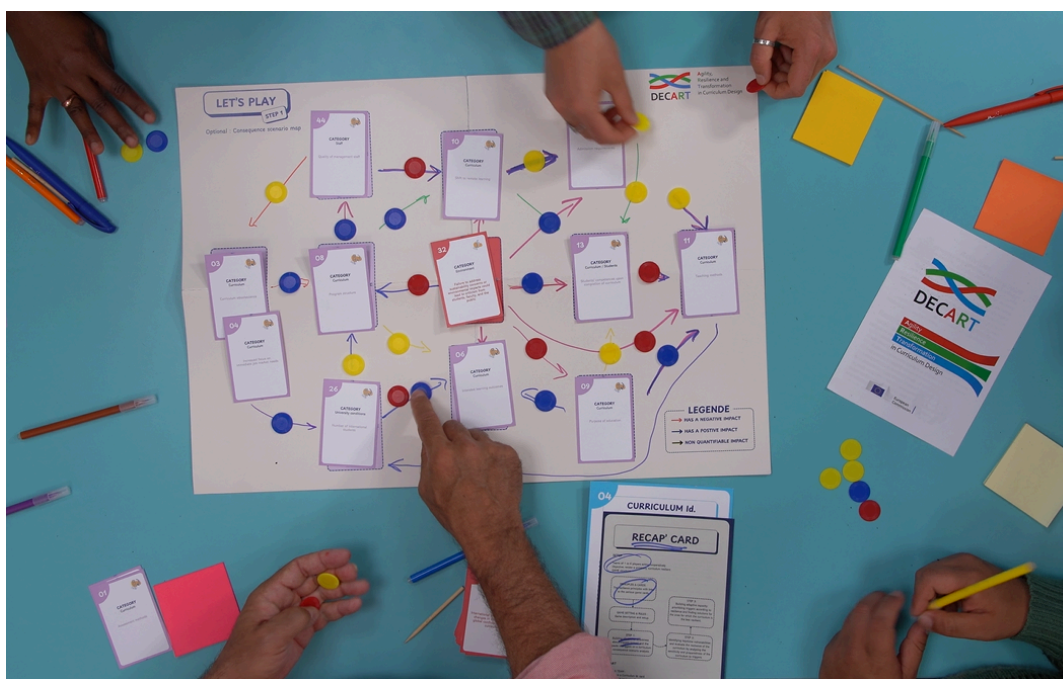
SUCRE :

Serious game for University Curriculum REsilience

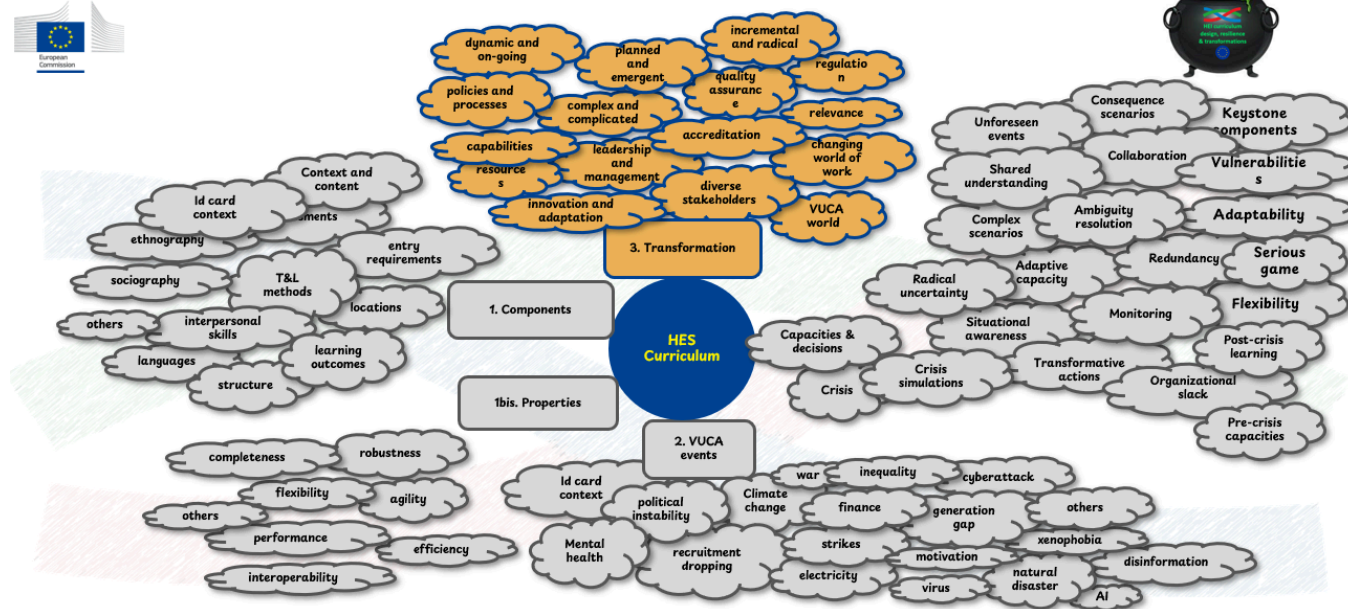
Preface

DECART (Designing higher Education Curricula for Agility, Resilience & Transformation) is a cooperation partnership in higher education funded by Erasmus+. The aim of the project is to propose methods and tools to guide STEM & Management educational leaders in innovative curriculum design and program transformations in an effort to be more prepared for unpredictable VUCA contexts (volatile, uncertain, complex and ambiguous) (Waldeck *et al.*, 2019). The project facilitates the identification and sharing of innovative curricula among partners in the project as well as associated international participants, in essence to assess and improve interoperability and resilience of curricula. Over the course of 3 years (2022-2025), the project brings together 4 universities from Europe and 2 from Africa and Asia.

This report presents the serious game called SUCRE “Serious game University Curriculum Resilience”. The objective of the report is to facilitate a continued use of SUCRE, i.e. train the trainees and future trainers, by presenting the different elements of the serious game including detailed game play elements and principles. Links are provided to i) videos, explaining rules and principles of SUCRE, ii) the MIRO interface for playing SUCRE online and iii) finally to the printable material of SUCRE. The report also provides an evaluation of SUCRE using the results of eight multiplier events done from January to October 2025. Part 1 presents SUCRE by introducing the material, game play and rules and different ways to use and play with SUCRE. Part 2 provides an evaluation of SUCRE using the results of eight multiplier events and the feedback from a satisfaction survey.



DECART constellation



The DECART components - here focusing on Properties, VUCA, and Resilience.



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Partners in DECART

The DECART project is co-funded with support from the European Commission, a project under the Erasmus+ program (KA220-HED - cooperation partnerships in Higher Education, number 2022-1-FR01-KA220-HED-000087657). This document reflects only the views of the authors. The Commission is not responsible for any use that may be made of the information contained therein. This document and its annexes in their latest versions are available from the DECART website (www.decartproject.eu).

The partners in the DECART projects are from six institutions. The Table lists the partners and the leaders from each institute.

Table. List of partners in the DECART project and the leaders from each institute.

Continent	Institute	Focus in DECART	Responsible person
Africa	UKZN: University of KwaZulu-Natal, Durban, South Africa	Management	Cecile Gerwel Proches
Asia	ITD: IT Del, Laguboti, Toba, Indonesia	Computer Science	Arlinta Barus
Europe	IMTA: MT Atlantique, Brest, France	Computer Science	Siegfried Rouvrais
	RU: Reykjavik University, Iceland	Engineering	Haraldur Audunsson
	VU: Vilnius University, Vilnius, Lithuania	Education	Valentina Dagiene
	RWTH: Aachen University, Aachen, Germany	Engineering	Clara Lemke



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Copyrights

This DECART report is publicly available with free access via the DECART website, under a Creative Commons, Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0, <https://creativecommons.org/licenses/by-nc-nd/4.0/>) license. The 6 DECART project partners let others to copy and redistribute this material in any medium or format, under the following [terms](#):

- Attribution: you must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use;
- NonCommercial: you may not use the material for commercial purposes;
- NoDerivatives: if you remix, transform, or build upon the material, you may not distribute the modified material.

The project coordinator, IMT Atlantique, grants the French Erasmus+ Agency and the Union the rights concerning the use of the project results for internal purposes and the right of disclosure to persons working for the Agency and other institutions, Agencies and bodies of the Union, as well as to the institutions of the Member States, and the right to copy and reproduce, in whole or in part, and in an unlimited number of copies.

This report has been produced thanks to the co-funding scheme of the Erasmus+ European Programme, project number 2022-1-FR01-KA220-HED-000087657. To cite this material use:

- Title: Train the trainers: A serious game SUCRE for “building resilient curricula”.
- Authors:
 - Roger Waldeck *et al.*, IMT Atlantique, Brest, France, leading author

Additional collaborators and reviewers are listed at the end of this document, in the collaborators & acknowledgement section

- Formal link to the material: www.decartproject.eu





Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Dissemination model

Type	<input checked="" type="checkbox"/> Teaching material <input checked="" type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material <input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input checked="" type="checkbox"/> Video <input type="checkbox"/> Service/Product
Languages	English
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input checked="" type="checkbox"/> Trainees <input checked="" type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other: <i>University Management</i>
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution
Lead Organisation	WP2 coordinator: IMTA, Roger Waldeck
Participating Organisations	European partners: IMTA,, RU, RWTH and VU African partner: UKZN ASEAN partner: ITD



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Table of Contents

Preface	1
Partners in DECART	4
Copyrights	5
Dissemination model	6
Table of Contents	7
Presenting SUCRE	9
Objective	9
Type of game	9
A decision tool	9
A Tool for teaching a resilience process	9
Main links	10
User manual	10
Game content	10
Cards	10
Boards	14
Game setting	16
Game play in three steps	17
Steps and associated cards and boards	18
Game play and rules	21
Step 1 Building situational awareness	21
Step 2: Identifying vulnerabilities: assessing the resilience of the curriculum to the triggers	23
Step 3: Building adaptive capacity	24
Game scenarios	26
Basic scenario A : all teams with the same Id. curriculum card	26
Basic scenario B : each team plays with a different Id. curriculum card	26
Advanced scenario : a decision aid scenario	26
A one hour session (two options)	26
With “Basic scenario B” : each team plays a different Id. curriculum	26
With “Basic scenario A” : all teams defend the SAME curriculum	27
Preparation	27
Game play	27
A two hour session	28
Basic scenario A	28



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Preparation	28
Game play	28
A 4 to 5 hour session (a decision aid scenario for with program leaders)	29
Before the session	29
During the session	29
Preparation	29
Game play	29
Train the trainees : feedback	30
The Multiplier events	30
The satisfaction survey	32
Structure of the satisfaction survey	32
Feedback from questionnaire	34
Main statistics : profile of participants	34
Players' evaluation and feedback	35
Acknowledgments & contributors	40
Contributors	40
To cite use:	40
Partners Bibliographical References	42
Additional reference	43



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Presenting SUCRE

Objective

SUCRE is a serious game developed in the frame of the DECART project for improving the resilience of curricula in higher education institutions. In this report, we use the term university and higher education institutions interchangeably. There are several definitions of the term curriculum, and here we take the definition from Mordhorst and Jenert (2022, p. 1260) as “a structural framework (i.e. modules, workload, assessment modalities) as well as an institutional framework (i.e. expectations towards learners and educators) in which educational activities take place.”

Type of game

SUCRE is a collaborative game where participants (program leaders, teachers and students) try to collectively apprehend and deal with different trigger events (crises or transitions) affecting their higher education Institution in order to improve the resilience of a curriculum.

The game can be played online on MIRO or in material version. Links and the printable material version can be found on the website of the DECART project (www.decartproject.eu).

A decision tool

A primary goal in the building process of SUCRE was to develop a serious game as a decision tool for real decision makers, especially program leaders, aiming to improve the resilience of their own curricula. Therefore SUCRE can be used as a decision tool that reveals a process for improving the resilience of curricula in real case situations. SUCRE is adaptable to specific contexts by allowing users to replicate their own curriculum, and create their own triggers (crises or transitions).

A Tool for teaching a resilience process

SUCRE can also be used as a tool for learning a preventive resilience process. Learners will become aware of a process that can be transposed to other organisational contexts.

Main links

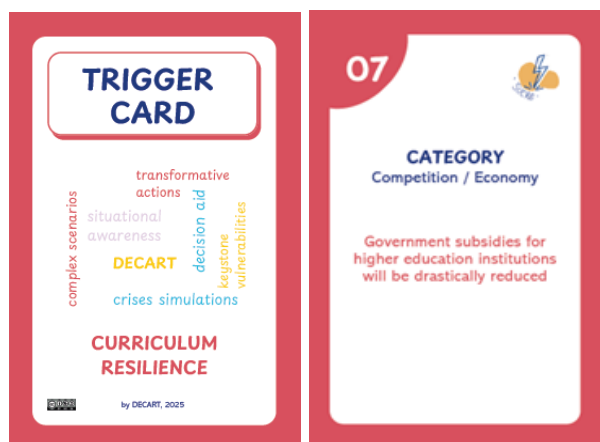
Here are the links found on the website

- Information about the DECART project and DECART website: decart-contact@imt-atlantique.fr , www.decartproject.eu
- Printable material on www.decartproject.eu
- Video presenting the game : on Youtube : <https://www.youtube.com/@decartproject>
- Specific questions about SUCRE: roger.waldeck@imt-atlantique.fr , decart-contact@imt-atlantique.fr
- MIRO board for SUCRE : mail to decart-contact@imt-atlantique.fr

User manual

Game content

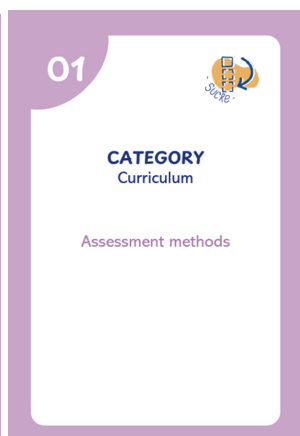
Cards



Trigger cards

Represent challenging events (crises or transitions) that higher education institutions may face.

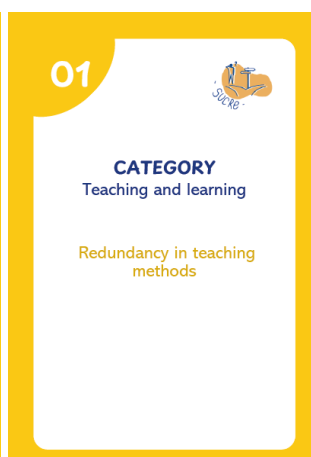
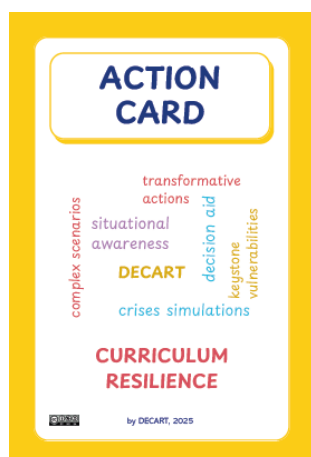
There are 39 trigger cards with 3 categories: "competition and economy", "environment", and "technology". Players can create their own trigger card.



Impact Cards

Represent potential consequences on the curriculum and university induced by a trigger event.

There are 44 impact cards with 4 categories: "curriculum", "university conditions", "staff" "students". Players can create their own impact card.



Action cards

Used for building solutions solving the problems raised by trigger cards.

There are 43 action cards with 4 categories: "teaching and learning", "curriculum structure", "curriculum context", "quality culture". Players can create their own action card.

CURRICULUM Id. CANVAS

• UNIVERSITY CHARACTERISTICS

Social and environmental responsibility is part of your reputation: Yes / No
Campus buildings concerned have high environmental performance: All / None / Some
Staff recruitment for curriculum: the university can easily find teachers (professional or institutional): Yes / No
% of civil servants: High / Low
Type of university: Public / Private sector
The board of directors can set staff recruitment quotas at its discretion: Yes / No
Funding from public sector: High / Low
Funding from private sector: High / Low
Funding from student fees: High / Low
Funding from research: High / Low
Investment: the university can easily mobilize funds for investment: Yes / No

• TYPE OF CURRICULUM

Degree of specialization: Towards employability / More fundamental scientific teaching
Dependence on the private sector for student placement: High / low / %
Major sectors of recruitment: Agriculture, Energy, Manufacturing, Commerce & Finance, Construction, Education & Research, Public service, Transport, None
Diversity of scientific fields: Highly specialized / Requiring more than one complementary field
Admission conditions and selectivity: High (quality is fundamental) / Low (quantity is favored)
Dependency of curriculum on international partnership: Yes / No
Language of instructions: National language / English / Hybrid
Adaptability : the curriculum content can easily be changed in short term (no legal constraints): Yes / No
Recruitment of students is highly dependent on reputation and accreditations: Yes / No
Trend in number of students: Increasing / Decreasing / Stable

Curriculum CANVAS

One "Curriculum CANVAS" which specifies different dimensions describing a university curriculum.

Used for a decision aid objective: program leaders generate their own curriculum id. card using the "Curriculum" canvas.

04

CURRICULUM Id.

An engineering degree in Industry and Digital Technologies, from IMT Atlantique

- UNIVERSITY CHARACTERISTICS

Social and environmental responsibility is part of reputation: **Yes**
Campus buildings concerned have high environmental performance: **Almost all**
Staff recruitment: the university can easily find teachers (professional or institutional)
for the need of the curriculum: **Yes**
% of civil servants: **High**
Type of university: **Public sector**
The board of directors can set staff recruitment quotas at its discretion: **No**
Funding from public sector: **High**
Funding from private sector: **Low**
Funding from student fees: **Low**
Funding from research: **High**
Investment: the university can easily mobilize funds for investment: **No**

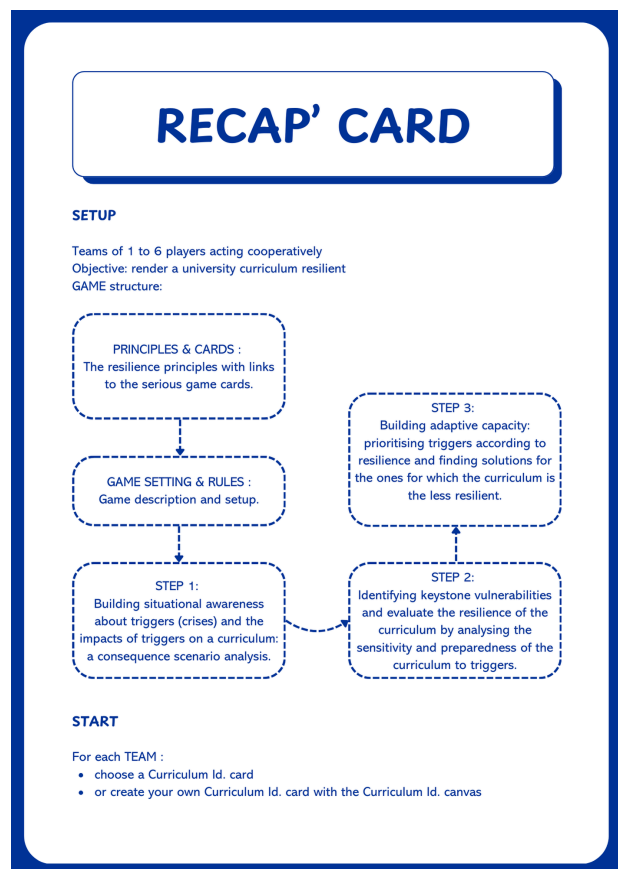
- TYPE OF CURRICULUM

Degree of specialization: **Oriented toward professional skills and employability but
with 40% of fundamental scientific teaching**
Dependence on the private sector for student placement: **High and compulsory for
graduation**
Major sectors of recruitment: **Energy, Manufacturing, Commerce & Finance, Education
& Research, Transport**
Diversity of different of scientific fields: **High diversity of scientific fields**
Admission conditions and selectivity: **High**
Dependency of curriculum on international partnership: **Yes**
Language of instructions: **Mostly in national (non English) language**
The curriculum content can easily be changed in short term (no legal constraints): **No**
Recruitment of students is highly dependent on reputation and accreditations: **Yes**
Trend in number of students: **Increasing**

Curriculum id.

A Curriculum id. card is an instantiation of the Curriculum canvas. It describes a specific curriculum of a university across the dimensions of the canvas.

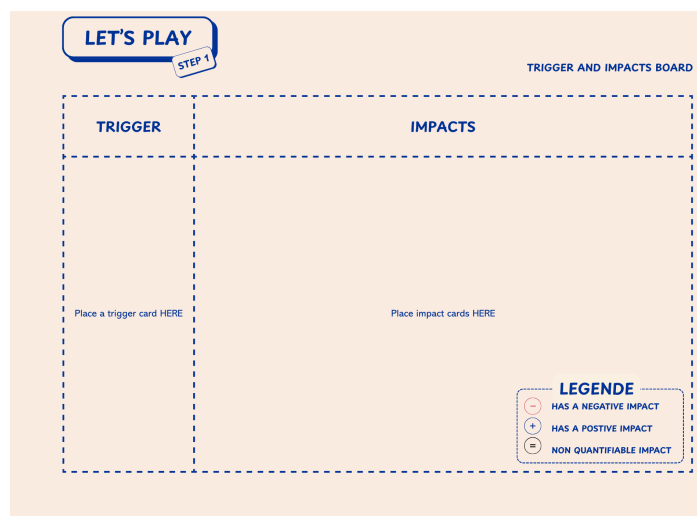
SUCRE has 9 Id. cards that can be used by players when SUCRE is used as a teaching tool of a resilience process.



RECAP' CARD

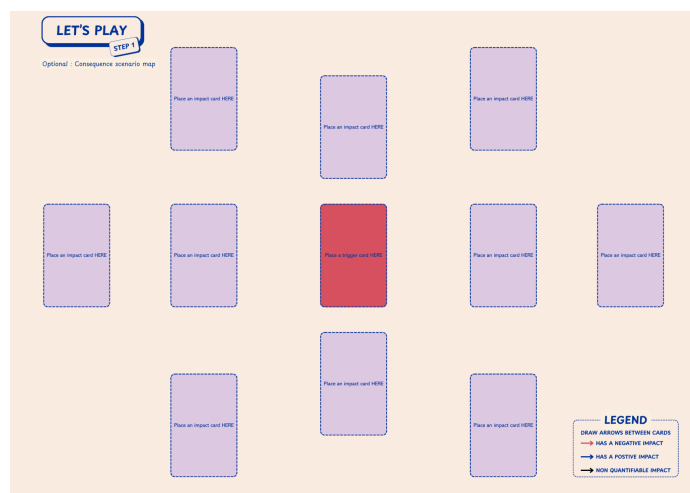
A summary of the game play

Boards



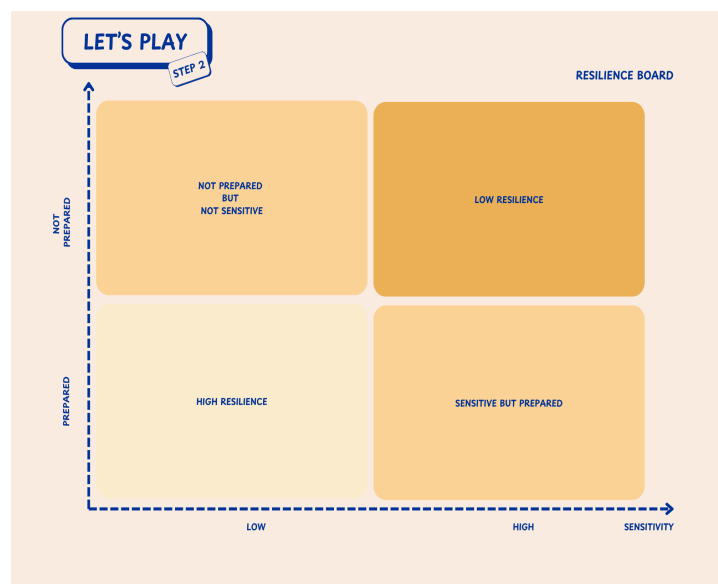
Step 1 “Triggers and impacts board”.

Used to analyze impacts of a given trigger.



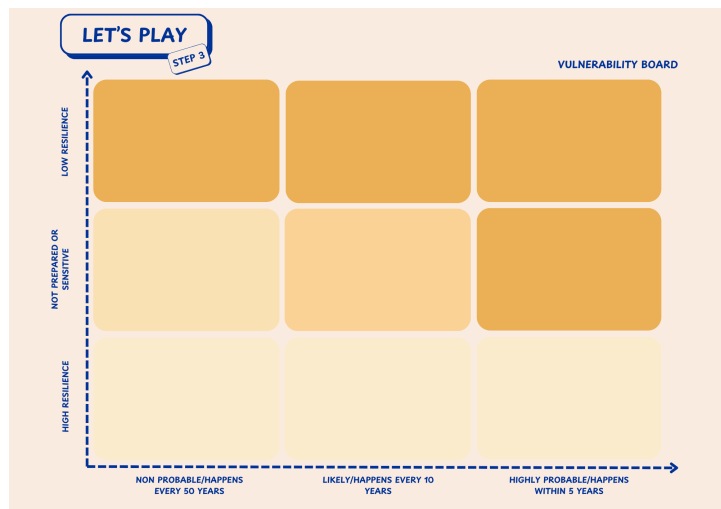
Step 1 advanced board: “Consequence scenario map”.

Used for linking a trigger card to impact cards and impact cards to other impact cards. Is used as an alternative to the “Triggers and impacts board”



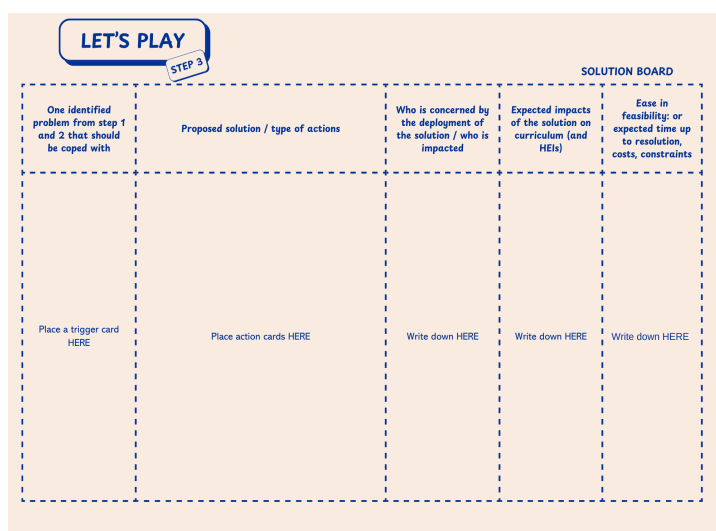
Step 2 “Resilience board”.

Used to evaluate the curriculum resilience with respect to a given trigger



Step 3 “Vulnerability board”.

Used to rank triggers according to how vulnerable a curriculum is to it.



Step 3 “Solution board”.

Used to design solutions for problematic triggers

Game setting

A **team** of 1 to 6 players acting collaboratively. **The optimal team size is 4** (based on a feedback of 39 players from 4 sessions with SUCRE)

Type of players: knowledge of higher education is recommended: typical players are: students, program leaders, teachers.

The DECART project has been funded with support from the European Commission. This document reflects only the views of the authors. Habersaa
The Commission is not responsible for any use that may be made of the information contained therein.



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Objective of SUCRE: to render a university curriculum resilient by playing the three steps

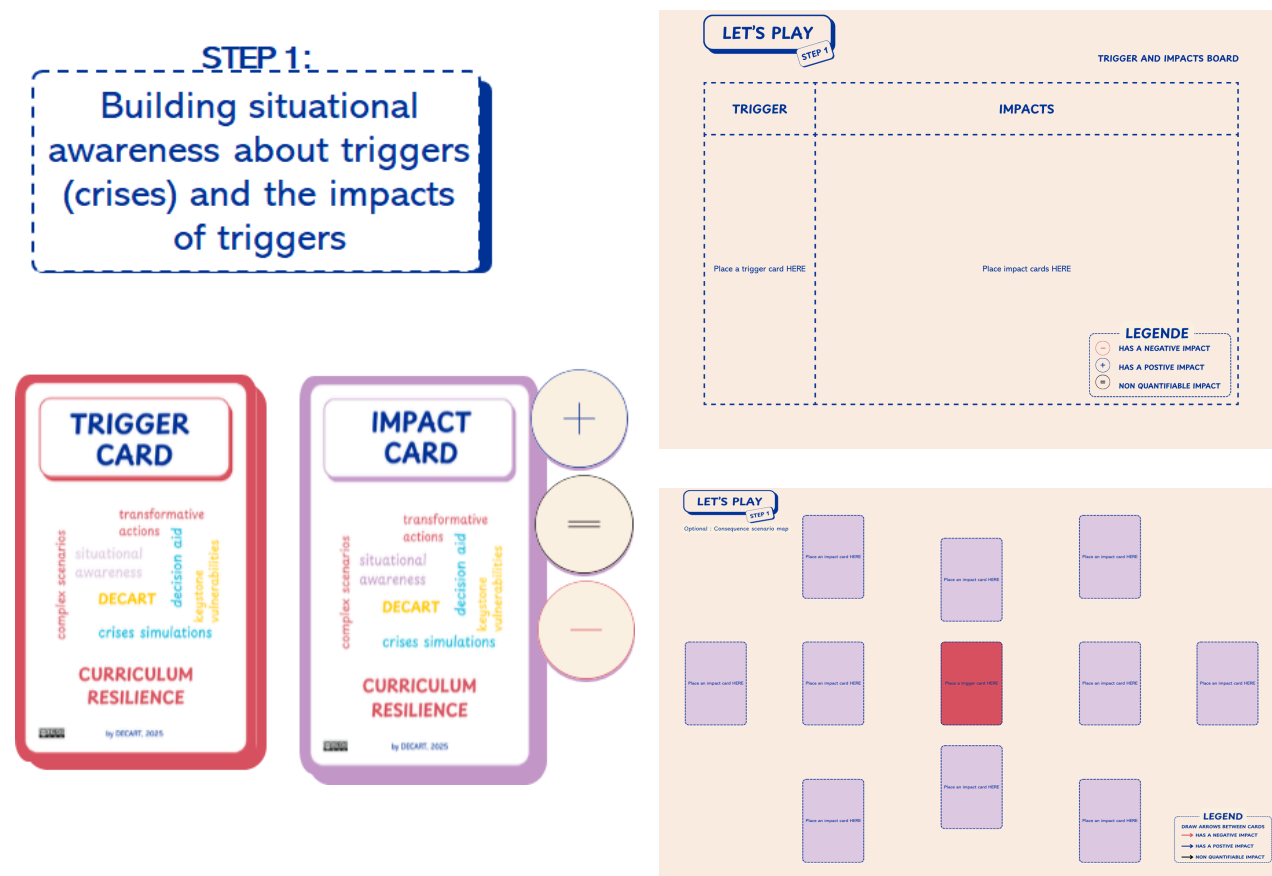
Game play in three steps

Step 1. Building situational awareness about triggers (crises or transitions) and the impacts of triggers on a curriculum using a consequence scenario analysis.

Step 2. Identifying keystone vulnerabilities of the curriculum and evaluating the resilience of the curriculum by analysing the sensitivity and preparedness of the curriculum to triggers.

Step 3. Building adaptive capacity by taking the following decisions i) prioritising triggers according to step 2 and the probability of appearance of the trigger; ii) finding solutions for the triggers for which the curriculum is vulnerable.

Steps and associated cards and boards



STEP 2: Identifying keystone vulnerabilities and evaluate the resilience of the curriculum to triggers

01

CURRICULUM Id.

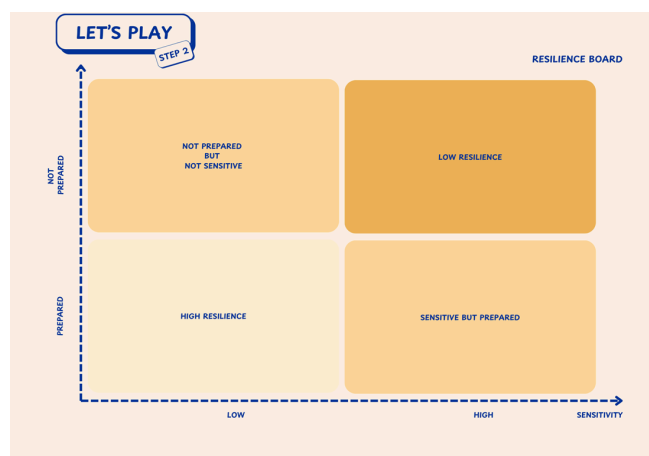
Global Business and Management, GBM Program
(generated by ChatGPT)

- UNIVERSITY CHARACTERISTICS
 - Social and environmental responsibility is part of your reputation: **Yes**
 - Campus buildings concerned have high environmental performance: **Some**
 - Staff recruitment: the university can easily find teachers (professional or institutional): **Yes / No**
 - % of civil servants: **High / Low**
 - Type of university: **Public / Private sector**
 - The board of directors can set staff recruitment quotas at its discretion: **Yes**
 - Funding from public sector: **Low**
 - Funding from private sector: **High**
 - Funding from student fees: **High**
 - Funding from research: **Low**
 - Investment: the university can easily mobilize funds for investment: **Yes**
- TYPE OF CURRICULUM
 - Degree of specialization: **Oriented towards employability**
 - Dependence on the private sector for student placement: **High (approx. 80%)**
 - Major sectors of recruitment: **Commerce and Finance**
 - Diversity of scientific fields: **Highly specialized in one field (business studies)**
 - Admission conditions and selectivity: **High (quality of student is fundamental)**
 - Dependency on international partnerships: **It plus**
 - Language of instruction: **English**
 - The curriculum content can easily be changed in short term (no legal constraints): **Yes**
 - Recruitment of students is highly dependent on reputation and accreditations: **Yes**
 - Trend in number of students: **Increasing**

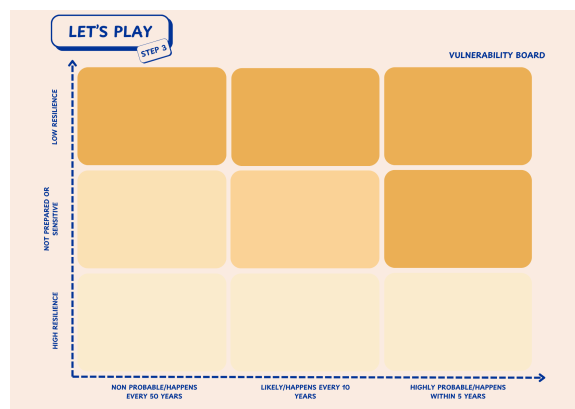
CURRICULUM Id. CANVAS

- UNIVERSITY CHARACTERISTICS
 - Social and environmental responsibility is part of your reputation: **Yes / No**
 - Campus buildings concerned have high environmental performance: **All / None / Some**
 - Staff recruitment for curriculum: the university can easily find teachers (professional or institutional): **Yes / No**
 - % of civil servants: **High / Low**
 - Type of university: **Public / Private sector**
 - The board of directors can set staff recruitment quotas at its discretion: **Yes / No**
 - Funding from public sector: **High / Low**
 - Funding from private sector: **High / Low**
 - Funding from student fees: **High / Low**
 - Funding from research: **High / Low**
 - Investment: the university can easily mobilize funds for investment: **Yes / No**
- TYPE OF CURRICULUM
 - Degree of specialization: **Towards employability / More fundamental scientific teaching**
 - Dependence on the private sector for student placement: **High / low / %**
 - Major sectors of recruitment: **Agriculture, Energy, Manufacturing, Commerce & Finance, Construction, Education & Research, Public service, Transport, None**
 - Diversity of scientific fields: **Highly specialized / Requiring more than one complementary field**
 - Admission conditions and selectivity: **High (quality is fundamental) / Low (quantity is favored)**
 - Dependency of curriculum on international partnership: **Yes / No**
 - Language of instructions: **National language / English / Hybrid**
 - Adaptability: the curriculum content can easily be changed in short term (no legal constraints): **Yes / No**
 - Recruitment of students is highly dependent on reputation and accreditations: **Yes / No**
 - Trend in number of students: **Increasing / Decreasing / Stable**

Step 2 :Vulnerability board



STEP 3:
Building adaptive capacity:
finding solutions for the
ones for which the
curriculum is the less
resilient.



LET'S PLAY STEP 3

SOLUTION BOARD

One identified problem from step 1 and 2 that should be coped with	Proposed solution / type of actions	Who is concerned by the deployment of the solution / who is impacted	Expected impacts of the solution on curriculum (and HEIs)	Ease in feasibility: or expected time up to resolution, costs, constraints
Place a trigger card HERE	Place action cards HERE	Write down HERE	Write down HERE	Write down HERE

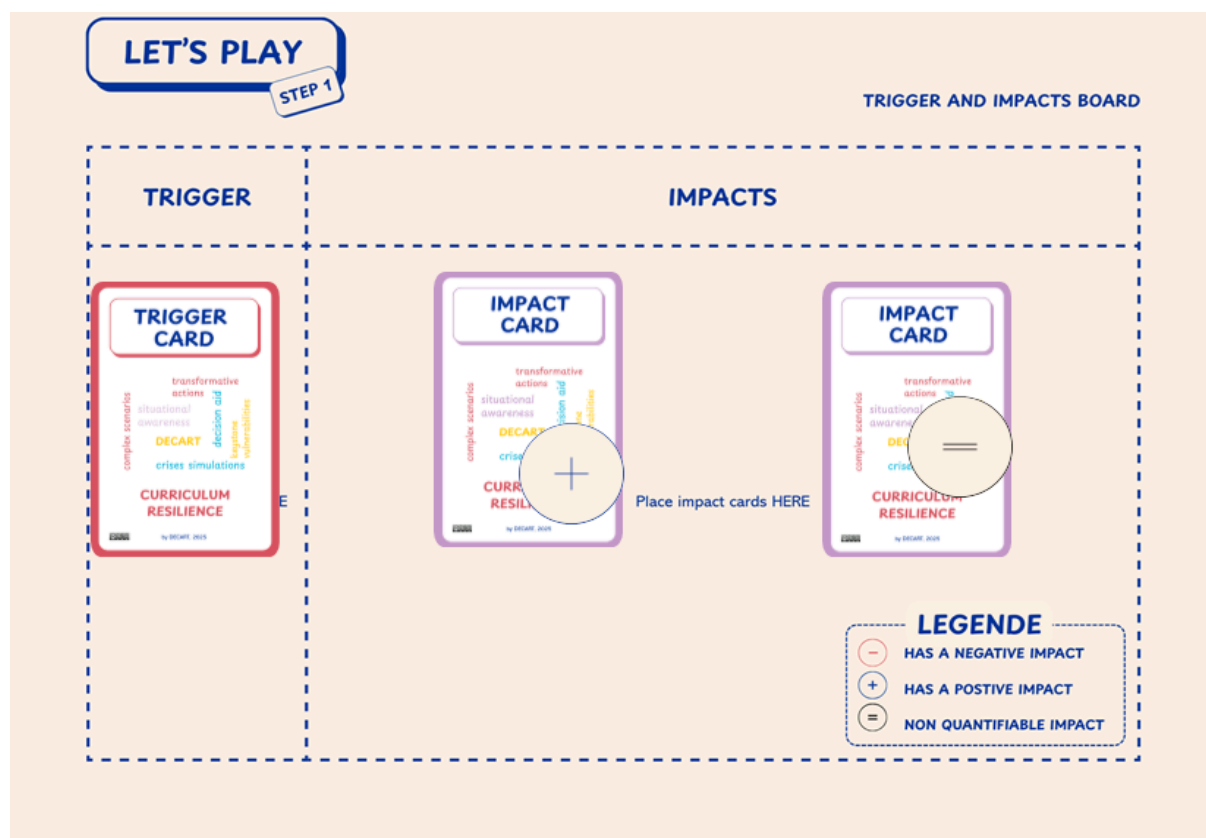
Game play and rules

Teams of 1 to 6 players. Three or four players per team is recommended.
A team chooses (or the game master distributes) one "Curriculum Id." card per team.
The RECAP card, making a brief recap of steps and instructions, is given to each team.
Each team plays through step 1 to 3 by doing the following:

Step 1 Building situational awareness

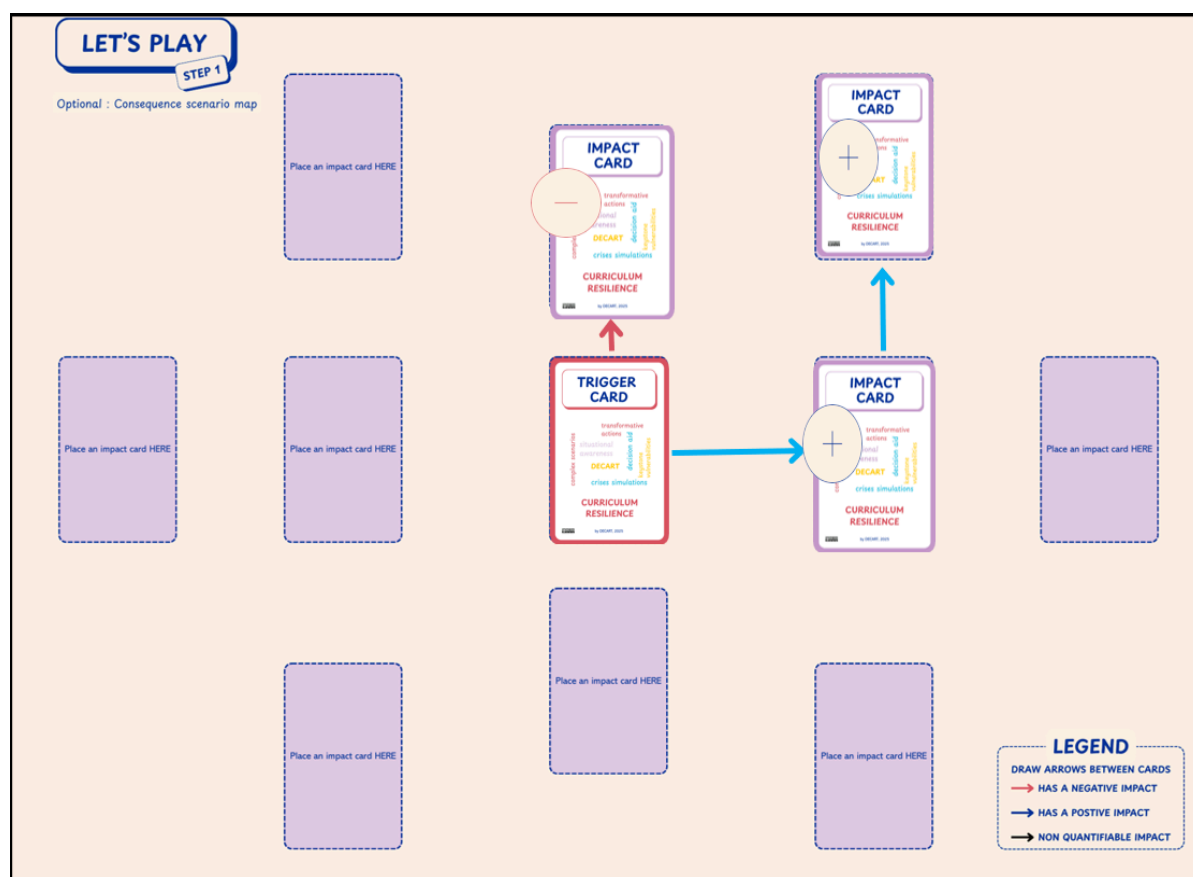
Playing with the board "Trigger and impacts". Players:

- Choose ONE trigger card
- Place it on the board "Trigger and impacts"
- Choose impact cards released by the trigger and pose them on the board "Trigger and impacts". Impacts may release other impacts
- Place a negative OR positive OR equal sign token on a given impact card representing a negative / positive / non quantifiable impact



An alternative: playing with the board “Consequence scenario map” . Players:

- Choose ONE trigger card
- Choose impact cards released by the trigger. Impacts may release other impacts
- Place impacts and the trigger on the board
- Create a consequence scenario map: arrows with colors red / blue / black represent negative / positive / non quantifiable links between cards
- Place a negative OR positive OR equal sign token on a given impact card representing the TOTAL negative / positive / non quantifiable impact of the trigger



Step 2: Identifying vulnerabilities: assessing the resilience of the curriculum to the triggers

For a given trigger of step 1, players:

- Identify the type of components (students, staff, balance sheet, elements of curriculum,...) affected by the trigger (using the analysis of step 1)
- Identify the components which are important for the university given the Curriculum Id. card of the team. Sensitivity of the curriculum to a given trigger is measured by the importance of the components affected by the trigger
- Make a statement about the degree of preparedness of the university to a given trigger (vertical axis)
- Evaluate the resilience of the university curriculum to the trigger by placing the trigger card on the "Resilience board "

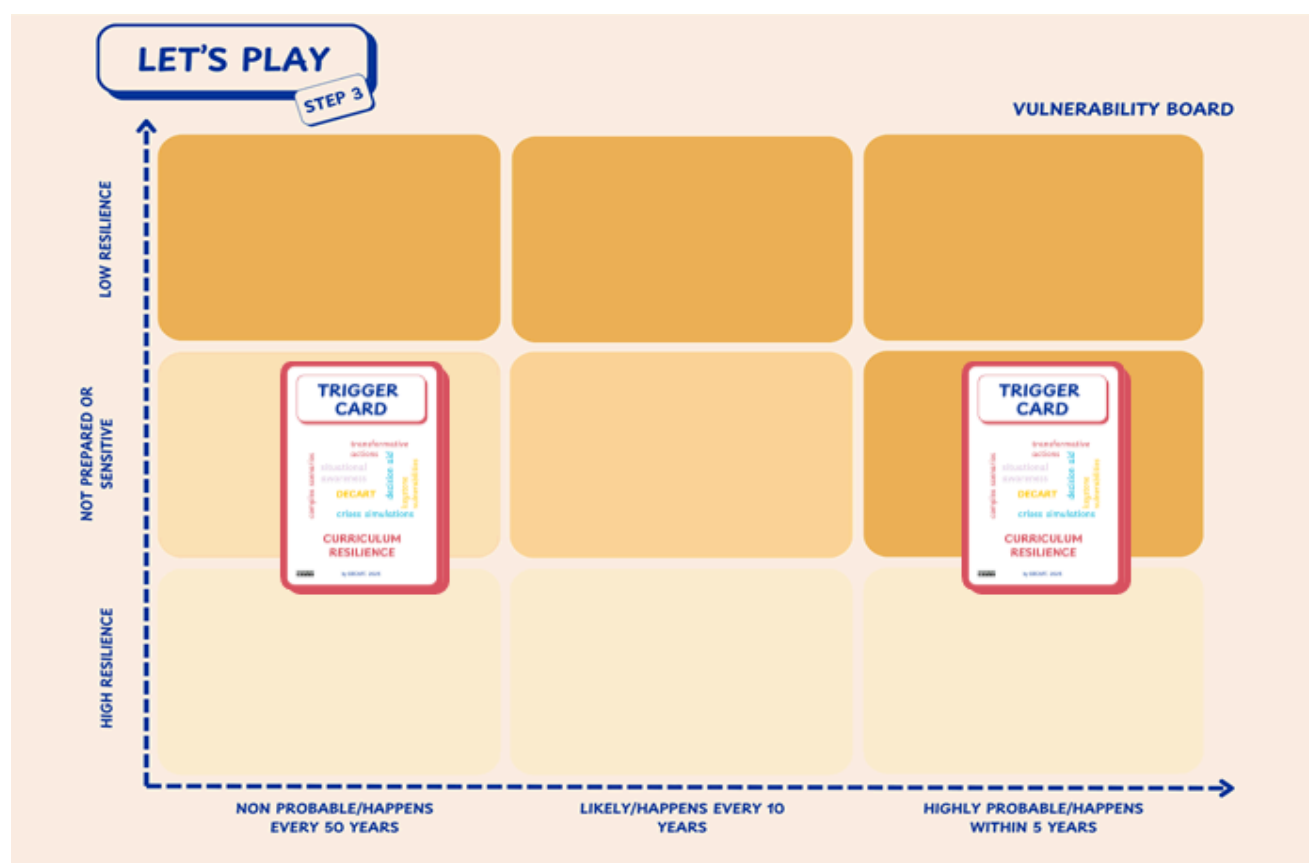
Repeat steps A to D for all triggers chosen in step 1



Step 3: Building adaptive capacity

Prioritizing triggers, players:

- Use the “Vulnerability board” to prioritize triggers to focus on. Triggers for which the curriculum has “low resilience” should be given priority.



Finding solutions, players:

The DECART project has been funded with support from the European Commission. This document reflects only the views of the authors. Habersaa The Commission is not responsible for any use that may be made of the information contained therein.

- Use the “solution board”
For the “problematic triggers, choose action cards to improve the resilience of the curriculum for the problematic triggers

LET'S PLAY

STEP 3

SOLUTION BOARD				
One identified problem from step 1 and 2 that should be coped with	Proposed solution / type of actions	Who is concerned by the deployment of the solution / who is impacted	Expected impacts of the solution on curriculum (and HEIs)	Ease in feasibility: or expected time up to resolution, costs, constraints
<div style="border: 2px solid red; padding: 10px; margin-bottom: 10px;"> <div style="text-align: center; border: 1px solid red; padding: 5px; background-color: white;">TRIGGER CARD</div> <div style="text-align: center; font-size: 0.8em; color: gray;"> transformative actions educational innovation DECART digitalisation curriculum resilience crises simulation </div> </div> <p style="text-align: center; font-size: 0.9em;">Place a trigger card HERE</p>	<div style="display: flex; justify-content: space-around;"> <div style="border: 2px solid yellow; padding: 10px; text-align: center;"> <div style="border: 1px solid yellow; padding: 5px; background-color: white;">ACTION CARD</div> <div style="font-size: 0.8em; color: gray;"> transformative actions educational innovation DECART digitalisation curriculum resilience crises simulation </div> </div> <div style="border: 2px solid yellow; padding: 10px; text-align: center;"> <div style="border: 1px solid yellow; padding: 5px; background-color: white;">ACTION CARD</div> <div style="font-size: 0.8em; color: gray;"> transformative actions educational innovation DECART digitalisation curriculum resilience crises simulation </div> </div> </div> <p style="text-align: center; font-size: 0.9em;">Place action cards HERE</p>	<p style="text-align: center; font-size: 0.9em;">Write down HERE</p>	<p style="text-align: center; font-size: 0.9em;">Write down HERE</p>	<p style="text-align: center; font-size: 0.9em;">Write down HERE</p>

Game scenarios

There are three ways, called “scenarios” to play SUCRE depending on the time available and the objectives followed. For an objective of discovering SUCRE and learning about a resilience process, scenarios A and B are played. For an objective of decision aid, the “decision aid scenario” is played.

Basic scenario A : all teams with the same Id. curriculum card

Each team has the same Curriculum Id. card: therefore teams represent the same university curriculum and **collaborate together**.

Advantage: more triggers can be tested in this scenario since each team plays a different trigger but teams represent the same curriculum.

Disadvantage: it requires more time than scenario B since sharing of information on lessons learned by each team is necessary and reaching an agreement between teams on which triggers to consider in step 3 has to be made.

Basic scenario B : each team plays with a different Id. curriculum card

In this scenario, teams are not concerned directly by the game play of other teams although a debriefing session may be used for discussing the good practices learned from the game and extrapolation to real situations.

Advantage: this scenario is useful if the game master wants to avoid inter teams discussion. Therefore this scenario is recommended for shorter sessions of less than 1 hour and a half.

Disadvantage: the challenging part is that each team should be able to find a problematic trigger so that step 3 “designing a solution” to a problematic trigger is worth playing.

Advanced scenario : a decision aid scenario

A team designs its own contextual game, representing the university curriculum the players belong to, by creating a Curriculum Id. card using the Curriculum Id canvas template. This scenario is recommended for program leaders of universities who want to challenge their own university curriculum.

A one hour session (two options)

For a session with 12 to 20 players

With “Basic scenario B” : each team plays a different Id. curriculum

Preparation

The game master distributes both pre-chosen curriculum Id. cards and 2 to 3 triggers to each team. Triggers and curriculum Id. cards may be different or similar, it is not important.

Only steps 1 and 2 and 3 up to placing triggers on the vulnerability board are played; step 3 with “the solution board” is only shortly introduced by the game master.

In a one hour session each group is focused only on defending its own curriculum. We avoid communication between teams for optimal use of time.

Game play

- The game master presents the general objective of the game, introduces step 1 and ask each team to select one trigger (7 minutes)
- Teams play step 1 (20 minutes)
- The game master introduces step 2 (3 minutes)
- Teams play step 2 (5 minutes)
- The game master introduces the “vulnerability board” step 3 (5 minutes)
- Teams play step 3 “vulnerability board” (5 minutes)
- The game master makes a short presentation of step 3 “solution board” (5 minutes)
- Debrief of participants or answers to the satisfaction questionnaire (10 minutes)

With “Basic scenario A” : all teams defend the SAME curriculum

Preparation

The game master distributes both a pre-chosen curriculum Id. card, the same for each team, and 2 - 3 triggers to each team, different for each team. Play only steps 1 and 2.

Game play

- The game master presents the general objective of the game, introduces step 1 and ask each team to select one trigger (7 minutes)
- Teams play step 1 using “the consequence scenario map” (20 minutes)
- The game master introduces step 2 (3 minutes)
- Teams play step 2 (5 minutes)
- Discussion between teams on which triggers are problematic (10 minutes)
- The game master makes a short presentation of step 3 (5 minutes)
- Debrief or participants fill in the satisfaction questionnaire (10 minutes)

For both scenario cases, if the game master disposes of 15 to 30 minutes more, the solution step 3 can be played

A two hour session

For a session with 12 to 20 players. 4 players by team.

Basic scenario A

All teams with one Id. curriculum. Collaboration between teams

Preparation

The game master distributes to each team the same curriculum ID card. Each team will get 3 triggers (one per category of triggers) which will be different across teams.

Game play

- The game master presents the general objective of the game and introduces step 1 (7 minutes)
- Each team chooses only one of the trigger (3 minutes)
- Each team plays step 1 using the “Consequence scenario map” board (30 minutes).
- The game master presents step 2 (5 minutes)
- Each team completes step 2 (15 minutes).
- The game master presents step 3 (5 minutes)
- Each team places its own trigger on the vulnerability board of step 3 (5 minutes)
- Each team justifies to other teams their conclusions about whether their trigger should be retained or not for the solution step 3 (3-5 minutes per team) (approximately 20 minutes in all).
- The game master recomposes the teams depending on the number of problematic triggers to analyse. If two triggers are chosen you can now split the 12 players in two teams of 6 players and each team will have to deal with one trigger through step 3 .
- The teams play step 3 using the “solution board; note that in the basic scenarios, it is enough for teams to complete columns 1 (identified problem) and 2 (solution) for the “solution board”. (20 minutes)
- Debriefing or Satisfaction Questionnaire (10 minutes)

Note that this scenario can be played in 1 hour 30 by squeezing the time schedule (as was done in QPES)

A 4 to 5 hour session (a decision aid scenario for with program leaders)

Type of participants : program leaders , teachers of the curriculum.

Number of participants and teams: for approximately 15 participants, 5 teams are made with groups of three participants.

Advice : the more teams there are, the more triggers can be analyzed in a session rendering the session more robust.

The same curriculum is used by all teams with a decision aid objective: to collaborate to increase the resilience of a curriculum of their common institution.

Before the session

- The program leader fills in the curriculum canvas describing the curriculum to be analyzed during the session and to be provided to all players .
- The game master prints the curriculum Id. card ahead of the session
- The game master discusses with the program leader to identify triggers which could be presented to players during the session

During the session

Preparation

The game master distributes 3 to 5 different trigger cards to each team among those discussed with the program leaders.

Game play

- The game master presents the general objective of the session, the time schedule and the purpose of SUCRE (10 minutes)
- The game master introduces step 1 (5 minutes)
- Each team chooses one trigger card. Each team can reformulate the chosen trigger card or even create a new one using blank cards. (15 minutes)
- Each team plays step 1 using the “consequence scenario map” board (40 minutes)
- Challenging the teams: 2 participants of each team move to another team. The team presents its consequence scenario map to the two participants. The consequence scenario map is challenged by the 2 incoming participants (20 minutes)

- Reformulation of the consequence scenario map taking into account the remarks from the 2 participants (10 minutes)
- COFFEE BREAK (10 minutes)
- The game master introduces step 2 (5 minutes)
- Each team place its trigger on the resilience board given the curriculum id card (15 minutes)
- The game master introduces step 3 , “vulnerability board” (5 minutes)
- Each team places its trigger on the vulnerability board and all teams discuss which triggers to retain in step 3 “solution board”(20 minutes)

The game master recomposes the teams depending on the number of triggers the participants want to analyze in the solution step of the game.

- The game master introduces step 3 , solution board (5 minutes)
- Each team plays step 3 with the solution board (the complete board must be filled in) (50 minutes)
- Each team presents its results to the other teams (during the rest of the time; 30-40 minutes for a 4 hour session)
- Debriefing or Satisfaction Questionnaire (10 minutes)
- For a five hour session, minutes of the session must be formalized by participants formulating the consensus about the triggers to consider which has emerged and the actions which could be taken following the session.
- If not all triggers of interest for the program leader have been analysed a new session must be programmed.

Train the trainees : feedback

The Multiplier events

There were ten Multiplier Events (ME) with SUCRE, four of them with publications in conferences, one session with a decision aid objective with program leaders. A feedback using the satisfaction survey was done for five sessions. 148 persons participated in the MEs with 45 respondents to the satisfaction survey.

Event	Date	Type and number of participants		Survey* (nb of respondents)	Publication	Type of presentation
PM5: South Africa in January	January 2025	7 DECART members (1 online) + 7 invited	14	NO	NO	Discovery (scenario B) all steps (1h30)

		participants (mostly teachers)				
Rochebrune (Conference)	March 2025	Researchers	10	YES (6) **, ****	Waldeck & Rouvrais, 2025a	Discovery, scenario A all steps (1h30)
Colloque "Questions de Pédagogies dans l'Enseignement Supérieur"	May, 2025	2 deans, 4 educators and 4 pedagogical experts, (1 not known)	11	YES (10)	Waldeck & et al., 2025a	Discovery, scenario A all steps (1h30)
Exploring Serious Games (Indonesia)	20 May 2025	2 Program Leader, 2 Curriculum Developer, 2 Senior Lecturers, 1 teaching assistant	7	YES (6) ****	NO	Discovery, scenario A all steps (1h30)
Workshop Serious Games (Indonesia)	22 May 2025	5 Program Leaders, 5 Curriculum Designers, 26 Faculty Members from 5 Different Faculties	36		NO	Discovery, scenario A all steps (2H)
SEFI (Conference)	September 2025	1 Program Leader, 1 Curriculum developer, 2 educators, others not known	8	YES (4)	Waldeck & et al., 2025b	Discovery, only step 1 (1H00)
Learning Show (Conference)	October 2025	5 Program Leader, 2 Curriculum developer, 1 Industrial, 1 Alumni, 2 educators (3 others), 4 not known	16	YES (12)	Waldeck & Rouvrais, 2025b	Discovery, scenario B, only steps 1 and 3 (solution board) (1H15)
CoDoFo	October 2025	9 Dean or rector, 3 program leaders, 2 Evaluator for accreditations, 1 Internal controller, 1 Deputy director, 1 educator***	13	YES (13)	Report	Advanced decision aid scenario (2H45)
National conference of Informatics,	September, 2025	ResearcherA/Prof 11, Deputy Principal 3, Student 1, Program	19	NO		Discovery only step 1 and 2, 3H

Šiauliai Academy of Vilnius University, Lithuania		Director 1, Other 1, Educator 2				
UKZN Graduate School of Business and Leadership, Durban,	27 August, 2025	Academics, programme leaders and more senior leaders	14	NO	Feedback from the organizers: <i>"overall positive: many had not thought of resilience for the curriculum, and appreciated the categories - triggers, impacts, vulnerabilities"</i>	Only a presentation of SUCRE without game play, 1 H

Table 1 : Main Multiplier event sessions (* Satisfaction survey; ** Number of respondents to the satisfaction survey ; ***: some participants indicated more than 1 profile.) , **** used a different satisfaction survey

The satisfaction survey

Structure of the satisfaction survey

The questionnaire has three parts : i) the profile of participants, ii) Players' feedback on SUCRE on a likert scale, iii) the scenarios, game play and players' remarks.

i) Profile of participants:

- country, gender and position;
- players experience on curriculum design, knowledge of resilience and gaming on a likert scale:

Q1. "Experience in curriculum design",

Q2. "Knowledge of resilience concepts",

Q3. "Experience with serious games" ,

ii) Players feedback

The satisfaction questionnaire evaluates SUCRE on its utility (Q4, Q5 Q6, Q13) , its Usability (Q7, Q8) and the players' experience (Q9 to Q12) . The effectiveness of steps 1 to 3 to reach their objectives is evaluated (Q14 to Q17) . All 14 questions are on a Likert scale ("Strongly disagree", "Disagree", "Neither agree nor disagree", "Agree", "Strongly agree", "I can't judge"). An item "I can't judge" was added to the Likert scale notably for the cases where some steps were not played.

- Q4. "Utility: Useful for improving the resilience" ,
- Q5. "Utility:for real world problems",
- Q6. "Utility:Promotes collective decision making" ,
- Q7. "Usability: the game design is attractive"
- Q8. "Usability: the game rules are clear"
- Q9. "Players' experience: SG is appropriately challenging",
- Q10. "Players' experience:new challenges at an appropriate pace "
- Q11. "Players' experience: SG does not become monotonous as it progresses",
- Q12. "Players' experience: would recommend to my colleagues for resilience issues"
- Q13 "Utility: I Know more about the resilience process"
- Q14. "I know better how to identify impacts of crises thank to step 1"
- Q15 "I better know how to identify vulnerabilities to crises thanks to step 2"
- Q16 "I know better how to prioritize triggers thanks to step 2 and 3"
- Q17 "I know how to design solutions to crises thanks to step 3"

An additional question was on **the interest in using SUCRE in the future**: *Are you interested in using the Serious Game SUCRE at your institution? (materials available in www.decartproject.eu (yes, no, out of my context)*

iii) Scenario played and suggestions.

The questionnaire finishes by asking respondents:

- How many steps they have played (Only step 1, Steps 1 and 2,...)
- The nearest game play duration of their sessions (One hour or less , One hour and a half,...)

- Their team size during the session
- What would have been the optimal size of the team for fruitful collaboration
- Any comments on the serious game overall (game design , game material,...) ?

Feedback from questionnaire

We present the feedback from QPES, SEFI, Learning show and CoDoFo with 48 participants among which 39 responded to the satisfaction survey¹. 48.7% of the respondents were female. Most of the participants were from France.

Main statistics : profile of participants

Countries:	Belgium	France	Netherlands	Norway	Poland
	1	34	2	1	1

Gender	n	perc
Female	19	48.7%
Male	20	51.3%

Program leaders and Deans/ rectors represented approximately 38 % of the participants

Profession / occupation	n	%
1 Curriculum developer, Other	1	2.6%
2 Industrial	1	2.6%
3 Program Leader, Curriculum developer	1	2.6%
4 Program Leader, Dean or rector	1	2.6%
5 Dean or rector, Evaluator for accreditations	2	5.1%
6 Curriculum developer	3	7.7%
7 Teacher	6	15.4%
8 Dean or rector	7	17.9%
9 Program Leader	8	20.5%
10 Other	9	23.1%

¹ We excluded the feedback from the first conference "Rochebrune" since the questionnaire was slightly modified in the meantime. The results of Rochebrune were however similar to the ones presented here (Waldeck & Rouvrais, 2025a)

The optimal team size according to participants are teams of 4 players (mode and median of the distribution)

Optimal team size for players

Size	3	4	5	6	7
Number of respondents	5	18	14	1	1

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
3	4	4	4.359	5	7

Table 2 shows the knowledge of players concerning resilience and the expertise concerning curriculum design. The responses of participants were evaluated on a likert scale from strongly agree to strongly disagree and recoded as “Positive” (participants who responded agree or strongly agree) ; “Negative” (disagree or strongly disagree), and neutral (neither agree nor disagree.) . 64% of the participants had both knowledge of resilience and experience in curriculum design.

		Resilience knowledge		
		Curriculum design		
Expertise		Negative	Neutral	Positive
Negative		0.08	0.00	0.03
Neutral		0.00	0.00	0.03
Positive		0.08	0.15	0.64

Table2 : Players’ experience in curriculum design and resilience knowledge (%)

Players’ evaluation and feedback

Preliminary remark on methodology:

- Since only step 1 was played for the SEFI session, in computing the statistics for figure 1 and 2, we did not consider the answer to questions Q13 “Utility: I Know more about the resilience process” , Q15 “I better know how to identify vulnerabilities to crises thanks to step 2” , Q16 “I know better how to prioritize triggers thanks to step 2 and 3”, Q17 “I know how to design solutions to crises thanks to step 3”.

Utility of SUCRE (Q4, Q5 Q6, Q13) was overall evaluated positively (over 84 % of positive and 0% of negative responses for all items : Q4. Useful for improving the resilience” , Q5. "Utility:for real world problems", Q6. " Promotes collective decision making").

Only the item “ Q13 I Know more about the resilience process” gets an approval rate of 62.9% and a disapproval rate of 8.6%.

Usability with questions Q7 . appropriately challenging , Q8. attractive game design gets an approval rate of over than 74% and a disapproval rate of less than 13% for Q8 (attractiveness of game design)

Players's experience with question Q9. " SG is appropriately challenging", Q10. " proposes new challenges at an appropriate pace ", Q11. " SUCRE does not become monotonous as it progresses" and Q12. " would recommend to my colleagues for resilience issues" gets an approval rate of more than 76% and a disapproval rate of less than 11%.

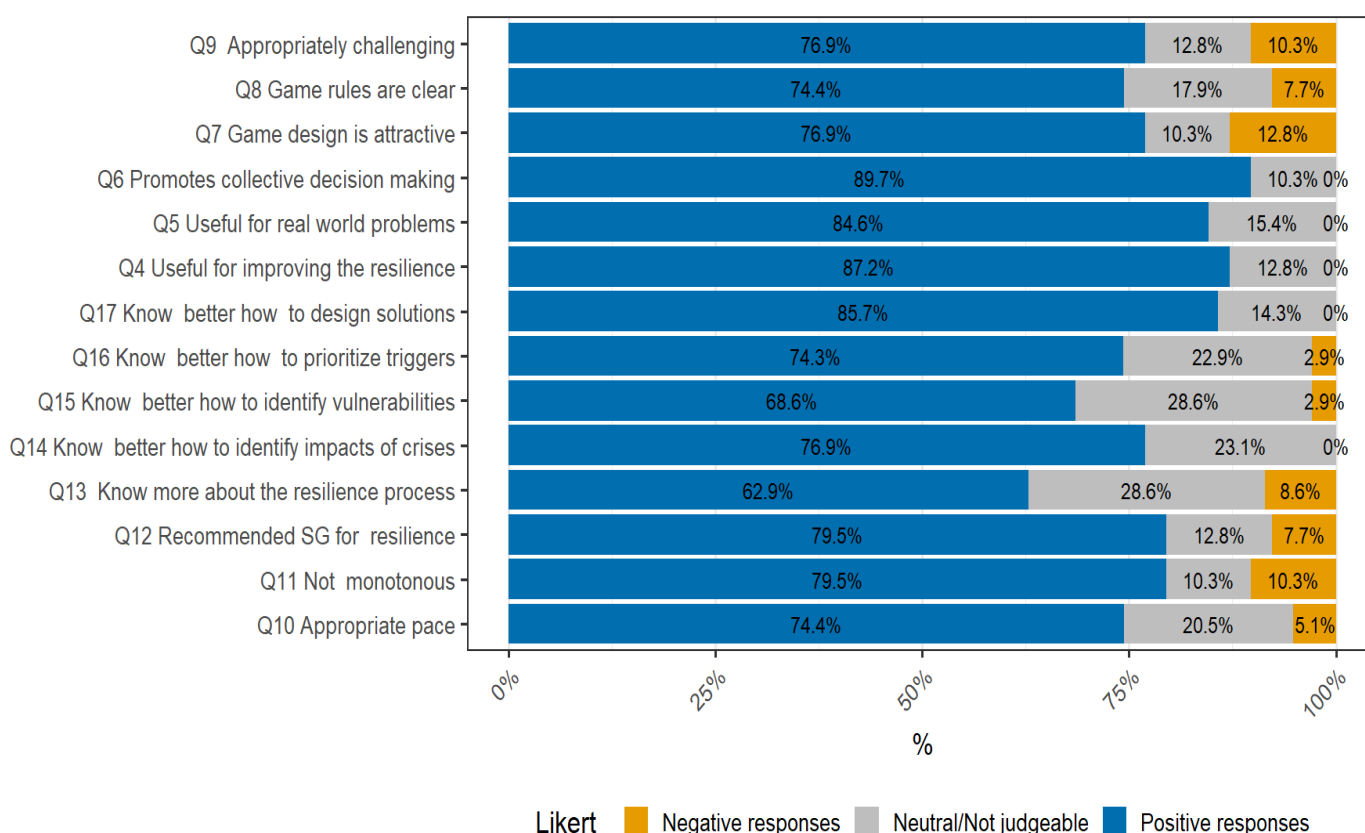


Figure 1: SUCRE utility, usability, players' experience, effectiveness of steps 1-3

Question Q12. "I would recommend to my colleagues has an approval rate of almost 80% (figure 1) in line with the 70% of respondents who want to use SUCRE in the future and more than 87% if we excluded the respondents for which the game is out of their context (figure 2)

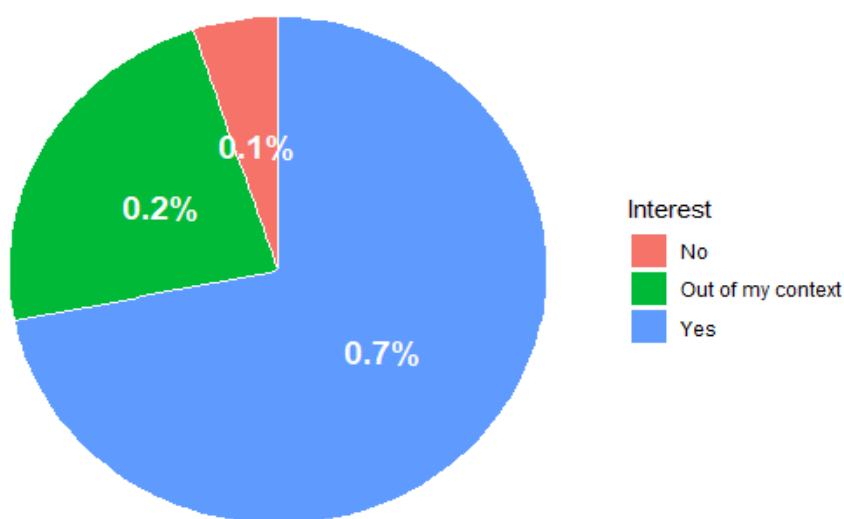


Figure 2: Interest in using SUCRE in the future

The effectiveness of steps 1 to 3 in reaching their objectives is also important with more than 68.9% of positives and less than 2.9% of negatives. Question Q17 "I know how to design solutions to crises thanks to step 3" get 85.7% of positive responses.

A special focus group are the program leaders since SUCRE was conceived as a decision tool to be used by them to collaborate with other stakeholders in order to improve the resilience of a curriculum. Figure 3 shows the feedback from this group comprising 22 respondents (dean, training director, program leaders and curriculum developer). Areas for improvement include explaining the resilience process (Q13) and the graphical design with an increase in the contrast of the fonts on some cards. But the main objectives have been achieved (Q6, Q5, Q4, Q17, Q12) with approval rates of over 80%.

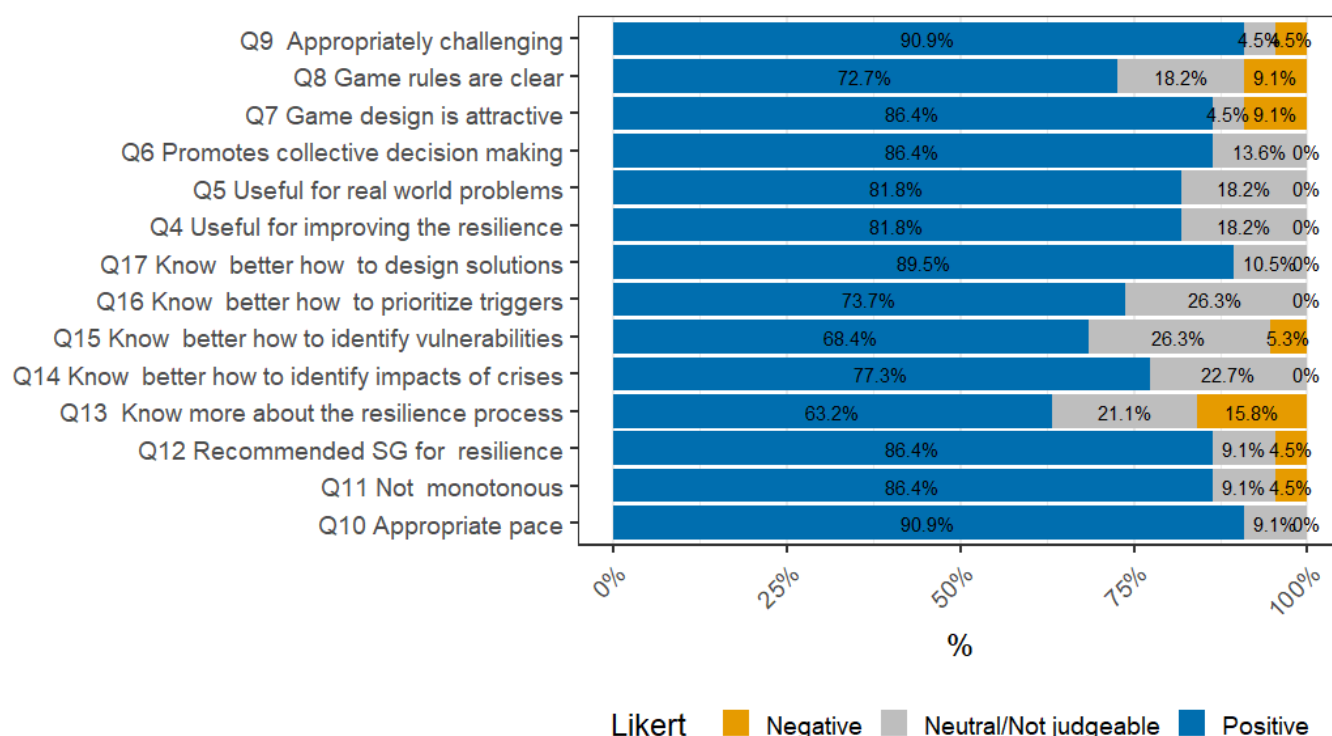


Figure 3: Focus on Program leaders, n = 22

We concluded by listing some of the suggestions of respondents (with translation in English added to the comments in french). Some of them align with the graphical design (comments 1, 2, 24) , some others on game play (7, 36) .

[1] "Accessibilité visuelle des cartes (contraste des couleurs)" "Visual accessibility of cards (color contrast)

[3] "Cartes curriculum : orange clair sur blanc peu lisible." Curriculum cards: light orange on white, barely legible.

[5] "Accorder un temps de personnalisation des cartes actions vides au début de la phase 3 du jeu" "Allocate time for customizing blank action cards at the beginning of phase 3 of the game

[7] "Like I said. To motivate players you need a win condition"

[12] "Good job. Wish you success and that it becomes real."

The DECART project has been funded with support from the European Commission. This document reflects only the views of the authors. Habersaa
The Commission is not responsible for any use that may be made of the information contained therein.

www.decartproject.eu

(2022-2025) - Page 38/44



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

[14] "Answer to the last question: it is harsh to answer yes/no/not interested - I am interested and recognize possibilities, but it seems to me to be challenging to create a common ground unless it is anchored in actual institutional frameworks and legislations. So, how would you design the game so that the first part would be anchoring the rules in the frameworks relevant to the institution, curriculum and situation?"

[24] "À French version"

[36] "Requires a game master"

[39] "Félicitations pour la qualité du jeu produit ; peut nécessiter qq adaptations au contexte (mais cents prévu)" ""Congratulations on the quality of the game produced; may require some adaptations to the context ."

²This SUCRE game is a home run for anyone serious about curriculum resilience. The overall design—which I'm assuming we played using the physical boards and cards, possibly mirroring them on the digital Miro board—is incredibly solid because it does two difficult things well: it makes a heavy, abstract topic (resilience) interactive, and it ensures the materials are all aligned. The Identity, Trigger, Impact, and Action Cards are the MVP here; they successfully translate vague threats into concrete scenarios and solutions, which is essential for collective decision-making, and the physical Board provides the perfect central workspace. While the online resources like the Miro Boards and Videos are great for accessibility and preparation, the core strength is how the structured physical materials force a clear, focused, and challenging discussion—it genuinely feels like a professional tool disguised as a game, which is the highest compliment for a serious game.

² A feedback from a session played in Indonesia

The DECART project has been funded with support from the European Commission. This document reflects only the views of the authors. Habersaa
The Commission is not responsible for any use that may be made of the information contained therein.

www.decartproject.eu

Acknowledgments & contributors

The authors of this report are particularly grateful to the students, faculty, university managers, academic leaders, teaching and learning professionals, and educational researchers who gave their time for fruitful discussion in the partner institutions, during conferences or workshops, during DECART onsite and virtual meetings activities or training, or even aside other project meetings. DECART Industry partners and Associations are warmly thanked for their advice.

Contributors

DECART project is an inter-institutional collaboration which includes a process in which parties (individuals or institutions) work together to achieve project goals. DECART knowledge is shared through regular open discussion during plenary project' and ZOOM meetings from April 2023. All DECART partners share values and ideologies around the project objectives. This DECART report, as project WP2 deliverable, is a joint authorship: several authors have participated and whose contributions cannot be separated one from the other. The property of this document content is the one of all the corresponding authors.

Lead Organisation	WP2 Coordinator: IMTA
Participating Organisations	European partners: IMTA, RU, RWTH, and VU African partner: UKZN ASEAN partner: ITD

More precisely, there is generally a 'leader' of the collaboration for this report:

- At IMT Atlantique, Roger Waldeck was responsible of this report writing process,

To cite use:

Waldeck, R., Gosselin N., Rouvrais, S., Audunsson, H., Barus, A., Dagiene, V., Gerwel Proches, C., Jasute, E., Kanyangale, M., Lemke, C., Winkens, A-K, et al. Train the trainers : A serious game SUCRE for "building resilient curricula". Report R23 , October 2025.

A collaborative project can not exist without the active implication on several stakeholders in the partnership. Several members actively collaborated for this first DECART report, formally as subsection producers or during informal discussion during project meetings or join staff training events. They include in country alphabetical order:

- In France:

The DECART project has been funded with support from the European Commission. This document reflects only the views of the authors. The Commission is not responsible for any use that may be made of the information contained therein.

www.decartproject.eu



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

- Nathalie Chelin, Gilles Jacovett, Siegfried Rouvrais, and Roger Waldeck from IMT Atlantique,
 - Chantal Puren and Coraline Lozac'h for the project administrative purposes
- In Germany:
 - Carmen Leicht, Clara Lemke, and Ann-Kristin Winkens from RWTH
- In Iceland:
 - Haraldur Audunsson and Asrun Mathhiasdottir from Reykjavik University
- In Indonesia:
 - Arlinta Barus, Inggriani Liem, Sari Silalahi, Eka Stephani Sinambela, Arnaldo Sinaga and Tahan Sihombing from IT Del
- In Lithuania:
 - Valentina Diagene, Vladimiras Dolgopolas, Egle Jasute and Asta Meškauskienė from Vilnius University,
- In South Africa:
 - Angela James, MacDonald Kanyangale, and Cecile Gerwel Proches from University of KwaZulu Natal.

References

Partners Bibliographical References

- Gardner Le Gars, J., and Waldeck R., Advancing Organizational Resilience Teaching in Management Education: A Novel Serious Game Design Algorithm. WP 2025 . In revision in *Journal of Management Education*
- Waldeck, R & Rouvrais, R. (2025a) Jeu sérieux pour la résilience et la transformation des systèmes de formation, quels transférables ?. *Les journées de Rochebrune 2025 : "Complexité et transitions" Rencontres Interdisciplinaires sur les Systèmes Complexes Naturels et Artificiels, 31ème édition des journées de Rochebrune*, Mar 2025, Rochebrune (Megève), France. [\(hal-05066554\)](#)
- Roger Waldeck, Nedjma Gosselin, Siegfried Rouvrais, Arlinta Barus, Inggriani Liem, et al..(2025a) Un jeu sérieux pour la résilience des programmes de formation universitaire : SUCRE. *QPES 2025 : colloque Questions de Pédagogies dans l'Enseignement Supérieur "Écosystèmes de formation : pour quelles transformations ?"*, May 2025, Brest, France. [\(hal-05064475\)](#)
- Roger Waldeck, Ann-Kristin Winkens, Clara Lemke, Carmen Leicht-Scholten, Haraldur Audunsson (2025b). Identifying curriculum disruptions in engineering education through serious gaming. *SEFI Annual Conference 2025*, Sep 2025, Tampere, Finland. [\(hal-05318401\)](#)
- Roger Waldeck, Siegfried Rouvrais (2025b). SUCRE : un jeu sérieux pour la résilience des programmes de formation. *Learning Show*, Oct 2025, Rennes, France. [\(hal-05318162\)](#)
- Roger Waldeck, Joanne Gardner - Le Gars, Ann-Kristin Winkens, Haraldur Audunsson, Siegfried Rouvrais, et al (2025,c) Curriculum Resilience, the DECART project (Designing higher Education Curricula for Agility, Resilience & Transformation). Report R21, University of KwaZulu-Natal - Afrique du Sud; Institut Teknologi Del; IMT Atlantique; Reykjavik University; Vilnius University; Rheinisch-Westfälischen Technischen Hochschule Aachen. 2025. [\(hal-05067271\)](#)
- Roger Waldeck, Haraldur Audunsson, Arlinta Barus., Valentina Dagiene, Cecile Gerwel Proches., Eglé Jasute, MacDonald Kanyangale, Clara Lemke, Siegfried Rouvrais, . Ann-Kristin Winkens, et al. (2025,d) A Building process of a serious game for resilient curricula. Report R22 , May 2025.



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

Additional reference

Mordhorst, L., Jenert, T. Curricular integration of academic and vocational education: a theory-based empirical typology of dual study programmes in Germany. *High Educ* **85**, 1257–1279 (2023). <https://doi.org/10.1007/s10734-022-00889-7>



Agility,
Resilience and
Transformation
in Curriculum Design

DECART project report, deliverable R23, May 2025

www.decartproject.eu



The European Commission support for the production of this report does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Main project contact:

Dr. Siegfried Rouvrais
IMT Atlantique
Graduate School of Engineering
Technopôle Brest-Iroise, CS 83818
Brest, France



This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).