Handbook

How to design a serious game from scratch ?

Table of contents

Introduction

Our journey towards the development of a serious game begins with an analysis conducted amongst our students that states there is a growing interest in learning through applied and innovative teaching methods. Our students want to "learn by doing" rather than "learning to do". Through our literature review and experimentations, we are now convinced that project-based learning can be a great addition to any class and allows students to be actors of their learning journey. Based on this statement we decided to launch a serious game on the topic of international development cooperation aid with a focus on Africa, relying on the expertise of one of our partners, the Foundation for Africa.

Defining the scope of the game was the first challenge as we wanted it to address the vast majority of our students, meaning the prerequisites should not be too demanding and specific. We still wanted it to be differentiating; we analyzed several serious games in our preparatory work which gave us a good insight on the good and bad practices to keep in mind. We then move to the design of the storyline before thinking about the actual development of the game. Spontaneously we might tend to rush to the end line and focus on the actual product while forgetting the necessary intermediate steps. Through this practical handbook we hope to give you useful tips and guidelines not to forget anything on the way and to build a serious game that has been well designed but also well thought with clear objectives and learning outcomes. Welcome to the journey!

1. Serious Game & Project Based Learning: definition and context

1.1 Definition serious game

From our literature review we can define serious games as a teaching and educational method founded on the basis of the constructivist paradigm. This method allows participants to become actors who co-build their own learning process.

The efficacy of this teaching method revolves around three main dimensions:
1. Power of transformation
2. Apprehension and comprehension of complex matters
3. Critical distance allowing to become proactive

• Power of transformation
Serious games have power of transformation. The gamification grants participants a safe space, which paradoxically, increases their confidence to take risks and to get out of their comfort zone to explore, learn, understand and come out of a complex reality.

• Apprehension and comprehension of complex matters
The virtual reproduction of a complex reality leads to the modeling of that same reality which can result on its simplification and understanding.

• Critical distance:
Gamification is a constant back and forth between the virtual world offered by the game and the real world which allows to take a step back. It allows participants to distance themselves from reality, to question it and then criticize it, thus, transforming it with new ideas and proposals. The game is a stimulation of the participant's imagination, which allow them to be.

> The first serious games appeared in the 1960s, but their introduction in the educational field began in the 2000s, with further expansion more recently in the education sector. This development is linked to the progress in artificial intelligence, which is considered to be the driving force of growth in the coming years. Consequently, serious games, which are still considered innovative academic methods with limited use, are expected to spread widely throughout the entire academic domain.

1.2. Characteristics of serious games

Recently there has been a significant growth of serious games in many areas, and this growth is expected to continue further. This is one of the reasons why it is important to classify games based on their characteristics. The characteristics of serious games discussed in this chapter have the potential to make a noteworthy difference in their success and effectiveness.

Activity
The first characteristic is the type of activity. Activity refers to the type of action that the player performs, and that the game requires them to perform.

Modality
The second characteristic is modality, which refers to the channel by which information is communicated to the players playing the game. This characterizes the sensory modalities the player experiences during the game. The use of the appropriate modalities is crucial, since effectiveness and user experience largely depend on them.

Interaction style
Thirdly, interaction style defines the way the player interacts with the game. Interaction can be done using traditional interfaces, like a keyboard and a mouse, or by using intelligent interfaces, like movement tracking.

- Social presence: Defines if a game includes a multi-player feature, or if it's single-player only. Single-player games focus more on an individual's distinct knowledge, while multi-player games place great emphasis on collaboration between players.

Environment

This criterion defines the environment of the game. The environment can be the combination of several aspects:
- 2D/3D: The game can be two-dimensional or three-dimensional, sometimes these two can be combined.
- Virtual or mixed reality: Virtual reality refers to a completely computer-generated world, while mixed reality includes augmented reality and augmented virtuality, so it mixes the virtual and the real world, and objects from each can interact with each other in real time.
- Location awareness: The game might allow the players to determine their own current locations freely. If the game allows it, it can be called an "open-world game".
- Mobility: Defines if a game is mobile or not. This refers to the game's compatibility with mobile devices.
- Online: If a game is online, it means that it can be played over a computer network, which is usually the internet. Most of the time online games include a "multi-player" feature, but this function can be used to communicate progress in real time.

Activity	Modality	Interaction style	Environment
Physical exertion Physiological Mental	Visual Auditory Haptic Other	Keyboard/mouse Movement tracking Tangible interfaces Brain interface Eye gaze Joystick Other	Social presence Mixed reality Virtual environment 2D/3D Location awareness Mobility Online/offline

1.3 Interest of integrating serious game and project-based learning in the programs

There is a huge number of findings when it comes to using serious games in education. Most of these are supportive, however negative effects were found as well. For example, game-based learning can improve the learners' holistic understanding of scientific conceptions, and their performance when it comes to science learning. By engaging students in immersive and interactive scenarios, these games create an environment where theoretical knowledge is applied and comprehended in a more profound manner. Still, when comparing serious game and non-game assisted learning approaches, there are no significant differences in their undesirable aspects. At the end of this chapter, you can find a table that summarizes the positive and negative aspects of the use of serious games.

Before submitting our project, we conducted a survey amongst our students in order to ensure that serious game and project-based learning integration in their programs were of interest. The survey measured students' experience and preferences related to practice-based learning methods. All partner institutions shared the questionnaire, and building on ca. 350 responses, we concluded that the overwhelming majority of students are interested in classes that offer methods to apply theory in the form of a serious game. They are willing to work on group assignments in an attempt to solve real-life based scenarios, and claimed this approach would provide them with interpersonal and communication skills of essential value on the labor market.

Through the literature review we found out that serious game and project-based learning focusing on real life problems answer several needs of students:
- They allow students know, experiment and understand all at the same time
- As they are a reversed pedagogy, students are actors in their learning process and therefore tend be more involved and committed
- They are inclusive pedagogies: students learn at their own rhythm through the game thus allowing.

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1.4 Positive and negative aspects of using serious games in education

Based on many studies, it is safe to say that serious games are effective in increasing the positive aspects of learning and providing a pleasant mood during the experience. Players can feel happier with the serious game assisted approach, and they can also achieve more success. Moreover, since this educational technology is easy to use, learners tend to focus more on the contents and enjoy the process. Another notable benefit of serious games is their capacity to enhance cognitive abilities. Through problem-solving challenges, decision-making scenarios, and strategic thinking exercises, these games stimulate and strengthen learners' cognitive skills, promoting a deeper and more active approach to learning. This also results in their participation in more learning activities and improving their academic achievements. Serious games offer the opportunity of flexibility. This means, that these games can adapt to many different styles and paces of learning, providing students a more personalized experience, and at the same time, abandoning the limitations of traditional learning processes.

Some negative results can be present when using serious games in education. For example, these games' nature can negatively influence the relationship between the mental workload and the learning effect. This means that in case the mental workload is heavy, the learning effect can decrease. Moreover, there can be cases where there is no significant difference in in-depth learning between game-based and non-game-based learning approaches in the same area.

Positive aspects	Negative aspects
(1) Provides a pleasant mood (2) Helps learners achieve more success (3) Learners focus more and enjoy the process (4) Easy to use (5) Helps to obtain cognitive abilities (6) Improves learners academic achievements (7) Provides flexibility	(1) Negatively influences the relationship between mental workload and learning effectiveness (2) In some cases, there is no significant difference in in-depth learning from traditional methods of learning

To sum up, there is a huge number of findings when it comes to using serious games in education. Most of these are supportive, however negative effects were found as well. For example, game-based learning can improve the learners' holistic understanding of scientific conceptions, and their performance when it comes to science learning. By engaging students in immersive and interactive scenarios, these games create an environment where theoretical knowledge is applied and comprehended in a more profound manner. Still, when comparing serious game and non-game assisted learning approaches, there are no significant differences in their undesirable aspects. At the end of this chapter, you can find a table that summarizes the positive and negative aspects of the use of serious games.

1.6 How to use serious games in education

Defining objectives, choosing game
The first step when it comes to using a serious game in education, is determining objectives and specific learning outcomes. This is going to define the criteria based on which a game can be chosen. It is important, that the chosen game meets all the criteria, otherwise not all learning outcomes will be met. It is also important to take the age and abilities of students, and available classroom equipment into consideration. Some games include a feature called "modding". Modding means, that the game can be modified to some extent, this way offering a more personalized experience.

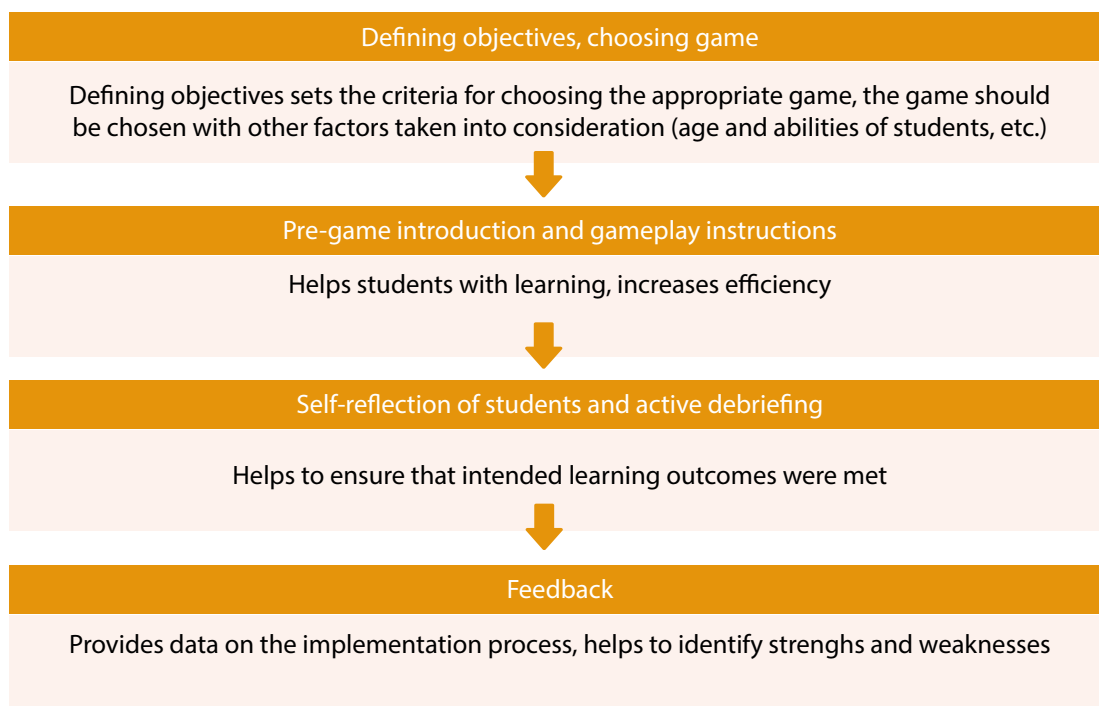### Pre-game introduction and gameplay instructions
Before starting the game, students have to be introduced to the game. Being familiar with the contents can help them with the learning process. Students must also be given clear instructions on how to play the game, as in some cases game mechanics can be equivocal and misunderstandable. Detailed instructions can reduce the number of questions related to the use of the game, and the players will be able to focus on the contents without hindrance.

Self-reflection of students and active debriefing
Active debriefing enables participants to connect activities and lessons (that they have learnt while playing the serious game) to the outside world. This part is very important, as it requires participants to focus on their own beliefs, assumptions and values that arose while playing the game. They are also compelled to re-evaluate their value systems and beliefs in order to make sense of the newly learnt pieces of information. The goal of active debriefing and self-reflection is to ensure that learning is happening on an individual level, and that experience is transformed into knowledge. Therefore, it is best carried out at the end of each activity. While adult learners tend to lead debriefing sessions on their own, young people require guidance throughout the process. They can be helped with questions, such as: What happened? Does what happen matter? How did you feel? Does this remind you of anything that you have experienced in the past?

Feedback
Collecting feedback from learners can provide useful data on the appropriateness of the game of choice and the implementation process. With this information, strengths and weaknesses can be identified, and the process can be refined in order to increase effectiveness and the experience. Providing feedback to students is also important, which can be done after assessing the participants' skills.

Defining objectives, choosing game
Defining objectives sets the criteria for choosing the appropriate game, the game should be chosen with other factors taken into consideration (age and abilities of students, etc.)

⬇

Pre-game introduction and gameplay instructions
Helps students with learning, increases efficiency

⬇

Self-reflection of students and active debriefing
Helps to ensure that intended learning outcomes were met

⬇

Feedback
Provides data on the implementation process, helps to identify strenghs and weaknesses

Still looks pretty blurry? Download our guidebook to the rescue !

2. Methods of assessing students' skills

2.1 Summative assessment

Summative assessment, or in other words completion assessment means that students' skills and knowledge are assessed at the end of the learning process. This method's main concern is whether the player successfully completed the game or not.

2.2 Formative assessment
Formative assessment, or in-process assessment means that students' skills and knowledge are assessed throughout the whole learning process by continuously monitoring progress and failures. This method also examines how, when and why a player made a certain choice.

2.3 Teacher assessment
This method focuses on the instructor's observations of students' performance. This means that the instructor personally monitors players while they are playing the game. This technique most commonly aims at assessing factors and skills, that the game is incapable of evaluating.

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3. The perfect Serious Game

In the framework of our project to avoid the common mistakes and be inspired by the best practices we analyzed a total of 20 serious games and real-life problems integration in higher education. The followings should be taken into account:

- E-Learning Integration.

As serious games are created for educational purposes, they must contain e-learning elements, such as digital resources, multimedia, while still maintaining simplicity and interactivity. They could also utilize educational platforms, like Moodle, in order to ensure the easy use of the game, reducing dependency on specific technical knowledge.

- Engagement and Interaction.

To ensure maintaining students' interest, serious games should gamify education by introducing gamified elements, creating an attractive and highly interactive environment for learners. In order to avoid some of the potential social dangers of these games, it is important to design them in such a way, that they promote the interaction among participants and incorporate discussions and teamwork, while at the same time, giving the opportunity to involve a large number of participants.

-Realism and Practicality.

Even though serious games' purpose is to make studying more enjoyable, there is no use for them, if they lack realism. Therefore, they must stay realistic, while mixing fun with seriousness, possibly simulating real-life processes and scenarios, or using case studies and real-world examples.

- Technological Integration, Usability and Design

Reducing limitations, serious games should be available on a wide variety of devices: phones, Personal Computers, laptops, and for more advanced games that include mixed reality elements, even VR and AR headsets can be used, to further improve effectiveness. Further increasing practicality, ease of use and accessibility, the games and the data should be saved in a cloud-based system. Moreover, to make sure that students can easily navigate within the game, the design and the UI should be kept simple, attractive and user-friendly.
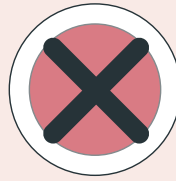
- Educational Value.

The game should offer opportunities for players to acquire and develop new, valuable knowledge and skills, such as factual information, problem-solving techniques, critical thinking skills, or creativity. In addition, students' learning process can be assisted by short educational videos, reminders, and even real rewards. Serious games can even be used to simulate financial decisions ("money game"), thus participants' financial awareness can be improved.
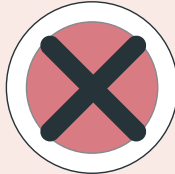
Maintaining the interest of students and ensuring the effectiveness of a serious game is difficult: a wide variety of diverse scenarios should be developed, providing a great challenge to users, this way keeping them engaged.

Appendix Best and bad practices/ Challenges and limits

In the framework of our project to avoid the common mistakes and be inspired by the best practices we analyzed a total of 20 serious games and real-life problems integration in higher education.

Type of technology	Missions:
	  - players receive instructions though a chat box from different people
	  - spaceship mission
	
	Role play/ following the journey of:
	- uber driver
	- farmer
	- refugees
		- Navigation in different «universes», worlds, countries
		- One environment only
		- Quiz
		- Multiple choice questionnaires
		- Building game
		- Coding and programming
		- Case study

Best practices	-Relevance and interest of the topic : -Game based on concrete subjects - Easy to understand - Promote empathy - Encourage critical thinking - Not too long - Give some basic information on the subject before starting the game - Make it fun and authentic : but not just fun make it informative - Educational value and good learning process - Raise awareness on a subject with an accurate representation - Take ethical dimension into consideration - Detailed tutorial - Nice and original design : appeal to imagination, immersive - User-friendly graphics - Use of different multimedia when playing; videos, interactive maps, interviews,... - Complex in game technology/ subtle dynamics - Connecting with real life actions	- Have a good storytelling - Have some guidance along the way & give positive feedback for a smart move - Indicators throughout the game to indicate to players how they are doing - Trial and error approach: players can try different approaches until they find the one that works best - Allow collaboration and interactions: * Have a chat box interaction - Single and multiplayer mode - Possibility to customize contents - Mobile friendly - Availabilities in several languages - Possibility for academic to assess how their students performed if the game is used in class
Bad practices	- Instructions are not clear or not enough time is allowed to read them - Too much training or prerequisites required to play the game - Too expensive games - Too many players and dialogues - No interaction - Have only one place to explore - Too difficult to play - Too many challenges appear within the game - Focusing too much on the fun game side and not on the actual content - Have to start all over again one making one bad move	- Very basic design of the game - Limited options for players - Too much guidance, not many choices for the players - Very basic content: no real takeaways for players - Repetitive tasks - Oversimplifying a complex issues or using stereotypes - Lack of sensitivity - Not engage stakeholders - No explanation provided when you fail - No feedback on the decisions players make - No real objective - Focusing too much on a western perspective

Type of pedagogy used	Documents Presentation/ Lecture / E-learning/ Conference/Modeling conference Challenge/ Hackathon/ Business contest Data analysis/ Research paper Film seminar Online test	Workshop Simulation (trial for example) Debate/ Public discussion Situation cards
Best practices	- Relevance and interest of the topic: -Choose a topic that everyone can relate to - Clarity of the presentation- Explain well the topic students will be working in beforehand - Use of visual documents to help understand the topic - Project integrated within the curriculum - Involve people working on the topic not only academic - Involve NGOs - Give the floor to everybody working on the topic: engage students - Mixed audience (students, staff, professionals) + involve people working on the discussed subjects - Working in teams - Giving independence of the students for the work: for example for climate change let the students choose a more specific topic ie pollution, animal cruelty - Allow students to be creative and innovative -Have a peer to peer approach : students for students - Have a mentoring throughout the activity - Make it fun	- Use simulation with role plays - Use debates to understand both sides of a problem: Address the topic from different angles - Use of case studies - Use competition as it may increase motivation - Check list to check the level of application - Concrete solutions to be implemented - Trigger broader discussions on the topic - Real Takeaways for students -Development of soft skills
Bad practices	- Too much focus on a specific area - Too technical subject - Too much bureaucracy to organize things - Highly expensive exercise - Too many time constraints: too time consuming or too short - No interaction - Leaving aside students that are shyer - No collaboration between students - Groups were too small - No support from the academic side	- Focus more on problem than on solutions - Solutions offered to the problem are ideal not practical - No wrapping up or collecting feedback - Sharing personal opinions and not proposing anything

Real life problem considered

- Racism
- Digital authoritarism
- Climate change/ Environment
- Cyberbullying
- Social media addiction
- Gender equality
- Genocide
- Nuclear proliferation

- Access to pharmaceuticals
- Assessment of bilateral and multilateral aid
- Impacts on cleaning robots
- Fast fashion
- Human rights
- Developing a strategy for a new product

- Losing business relevance & customers on the market
- Corruption
- Disability
- Road safety

4. Get ready

The development of a serious game can be related to the design thinking process that outlines five steps to reach an innovative solution to a given problem.

EMPATHIZE   DEFINE   IDEATE   PROTOTYPE   TEST

4.1 Start with why

Before launching a serious game, it is very important to question the audience and the pedagogical interest that lays with it in order for your game to be relevant with the needs of students. This will correspond to the "empathy" phase of the design thinking process in which you learn more about the users you are developing your game for to define who they are and what matter to them.

✓ I have identified my final users: a specific group of students in a particular class, a full classroom, different classrooms, etc. and how they will work: individually? In groups?

✓ I have questioned their needs: what will they get out of the serious game

✓ I have defined clear rules for the game: it is credit baring? Part of a challenge? A competition? Is it Mandatory?

✓ I have defined specific learning outcomes that will emphasize the interest of the game for students and the potential other faculties involved

✓ I have identified whether students need prerequisites to take part in the game and if so I have ensured that they have the required skills and knowledge

4.2 Go with how

Once you have defined the framework of your serious game it is crucial to ensure that you have all the resources needs to make it happen. We identified several categories of resources:

• Financial resources: make sure you have an allocated budget for the development of your serious game

• Human resources (both internal and external): Who will you need to successfully implement your serious game. Do you have access to the right resources to develop the game both in terms of graphics and content and are they available? Do you have someone available to animate the game? Do you need someone to assess the game?

• Time: Make sure that the people involved have time to work on the game. If you are involving external actors, make sure that they will be available throughout the process. Anticipate the next steps and share with all people involved a retro planning or GANTT Chart so that everybody knows when to work on what

• Materials and technology: will you be using a website? An app? Do you have the IT resources to build the game? If students need to download something to play can they actually do it?

5. Ready? Set? Go!
5.1 Setting the framework

Think what you would like your game to be like. This phase would correspond to the ideation phase of the design thinking process. You must define:

THE GENERAL FRAMEWORK
- the format of the game and the devices on which it will be played if you launch an online serious game. Would it be mobile friendly for example?
- The story: what do you want to tell? Is it a mission, a role play, a quest; a case study?
- the environment: is it taking place in an imaginary setting? In a specific place? If so what is the perimeter: a room, a town, a region, a country?
- the timeframe: does the game have a timeframe? If so is it taking place over a day (role play for example), over several years?
- The timeline: can the players go back and make another choice?
- The player mode: single/multiplayers?
- The guidelines and information displayed throughout the game:
- the characters: will the players be interacting with characters? Who are they?
- The indicators of success: it is crucial to have indicators so that players know whether they are performing. Indicators can be simple points, or social, economic, financial indicators.

All these elements will be the base for your scenario. It is also essential at this stage that you write the instructions for the users to play the game. Make it short and easy to read

5.2 Visualizing the game: interest of drafting a storyline

It is very important to think beforehand of all the questions and options that will be offered to the players throughout the game. Drafting a storyline is very useful and will allow you to make sure you are consistent with your scenario and your character(s).

Advices for drafting your storyline, from the Foundation for Africa

- Define a coding system. If Q = question, O= option, C= conclusion for example: Q1 > O1/2/3> C1/2/3
- Once the coded storyline is ready put in in scheme/drawing to ensure you have not missed any option or conclusion
- Think right away of the scoring systems and be logical and consistent
- Try to make the paths overlap but be careful to distinguish them. This will help you and save time for you while planning the game. (Flexible answers – one answer can be used to 2 questions in some situations)
- Be careful while adding a list of external effects to the game (we used natural disasters in our game). Different elements will have different consequences which will make your gameplay very complicated.
- Ask good questions. Questions have to be straightforward, informative, detailed so the player is not completely lost while choosing an answer, even if they have no background information on the specific topic.
- Make a tree drawing so you can follow the game while planning
- Cooperation with other possible donors, ie. in the HU storyline we proposed cooperation with FR and with CN. Describe if it is a good or bad decision and why.

Challenges to be considered while drafting your storyline:

- Anticipe your schedule: drafting a storyline often takes more time than anticipated.
- Do research and get familiar with your topic to ensure a reality scenario.
- Be careful to harmonise outcomes and ensure questions and answers make sense.

Looking for some inspiration ? Download our template of storyline.

5.3 Prototyping the game

Prototyping allows to make sure that the game is working properly and to detect incoherence. The objective is to build the environment of the game based on the framework you have defined in the previous steps. You will be able to correct potential mistakes and to readjust some of your content, shall you realize it does not appear well. If you are designing an online serious game ensure graphic designers can help you with the programming, displaying etc.

Testimony from Alex Castel (STUCOM) on creating a model in the game:

" When it comes to developing the game, it is important to have a clear structure in mind. Initially, the structure will be a tree, considering that each situation in the game should have a limited number of options (approximately 3 per situation). For each situation, one must think about the consequences it will have and the new situation it will generate.
It is recommended to have about 3 levels of depth for this type of game.
Each situation should be numbered, and after each consequence, indicate to which situation the player should go. The last situation will be numbered 99, and it is the one to which all the consequences of the final cases will lead.
It can be useful to document this information in a PowerPoint presentation, using one slide for the situation being modeled, including the text of the situation and the different options available to the player. Create a different slide for each option, reflecting graphically the consequence of that decision and providing an explanation of what happens from that point onward due to that decision. These slides will be linked to the new situations, considering the player's decision.
Finally, the programming team, based on this PowerPoint where each slide has been clearly defined, will translate this information into HTML language with the help of JSON technology.
This way, the game will be accessible online."

Based on our experiences, we propose the following milestones of the programming process:
1. Create a website/storage platform, make sure this and that.
2. Coding.
3. Front-end development.

5.4 Testing the game

Testing the game is key and should be completed by different audience to ensure that it will fit to the most. Testers should be both academics and students as they will not consider the same things and both of their feedback will be important. They could both report on the design, the environment, the story and the general framework. Students will give you more insight on the "recreational" part of the game and the interest of the story while academic might report on the learning outcomes, the quality of explanations provided throughout the game. It would be important also to test it to people with various level of knowledge of the topic addressed to represent the variety of your classroom.

In your serious game development planning it is therefore important that you anticipate the testing part and allow some extra time to:
- Have several qualitative feedbacks
- Rework on the game according to the feedback you received you received.

We used the following template to work on the feedback of the tests:

	Comment	Feasible? (Yes/No)	What to do?	Responsible partner
Design-related feedback				
Technical background-related feedback				
Content-related feedback				

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Questions to be asked when testing the game
- What did you think of the game interface? Was it easy to understand and navigate?
- Did you encounter any technical issues or bugs while playing?
- How would you describe the difficulty of the game? Was it too easy? Too hard?
- Was there any aspect of the game that you found confusing or poorly explained?
-What are your thoughts on the music and the sound effects of the game? Did they contribute to the overall experience?
- Do you think the story or objective of the game was clear? Where you lost at any point?
- Were you able to play the game smothly on your device (computer, tabet, mobile)?
- Is there any additionnal feature you would like to see added to the game?
- What aspects of the game did you enjoy the most ? What aspects could be improved ?

> In the project we arranged a test with lecturers and a beta-test with students. The feedback was collected in an electronic survey form, so that the results could be handled more easily. As there were lots of improvement in the game partly owing to the feedback, we arranged a second round of beta test with students. The finalization of the game happened with taking account this feedback. Then, the final serious game was integrated in pilot courses of the partner institutions. The pilots happened with using pre- and post-questionnaires and focus group interviews with the students to improve the implications of the game in classes.

5.5 Launching the game

Once you have taken all the feedback into consideration, it is time to launch the game and introduce it to your students.
- Specify the timeline and the player mode: will they play individually? In teams?
- The timing: how long do they have to play the game?
- Explain the objectives of the game and how it is related to your course content
- Take time to go through the indications that you wrote for the game and allow time for questions.
- Ensure that you are in an appropriate environment: if your game contains sound for example make sure students have the necessary devices not to disturb each other's.

… and you are good to go!

6. Things you should pay extra attention to

Considering the work conducted at the AI Forum which took place in Montreal in November 2017, three features are crucial to consider:

1. Ethics
2. Democracy: accessibility for all
3. Environment: how can a serious game (SG) contribute to the opening of a safe space designed for international dialogue, assuring a collective, equitable, inclusive and environmental development?

When designing a serious game, a certain number of traps must be avoided:
• The ideological trap: it is necessary to create a serious game based on scientific information. If one of the creators has parallel knowledge or prejudiced views on the game's subject there is a risk of negatively influencing the participants of the game. What are the values on the basis of a serious game? Is there a scientific method guarantying the quality of the serious game learning content?

• The instrumentalization trap: It is important that the creators of the serious game take into consideration humanistic values. The risk is to develop a "business as usual" model focusing on the neoliberal economic system, founded on the unlimited exploitation of human, animal and vegetal resources. How to ensure that serious games teach other type of world dynamics, including systems that are not based on domination, exploitation and accumulation? How can the game contribute to the elaboration of a world meant to be "our commune home" which needs to be taken care of? This trap could also be called "dehumanization".

• The exclusion trap: It is important that serious games do not result in the exclusion of the participants, who may evade alone to a virtual reality. It must be a way of developing real qualitative interactions. For that reason, it is important to integrate participants in communities in order for them to develop feelings of affiliation as well as several cooperation and commitment capacities as a member of a group.
How can the serious game highlight charity and generosity for the general well-being? This trap could also be named "individualism".

7. The example of our game "Change the game not Africa"

Our project titled "IDEC PBL" was initiated by the University of Szeged (Hungary) and involved STUCOM (Spain), the Foundation for Africa (Hungary), and iaelyon School of Management (France). Our project aims to improve the quality of education by integrating project-based learning as active learning element in the field of international development cooperation. In an attempt to create a modern learning environment and adapt to the expectations of students and the employment market, we have designed an interactive online serious game that can be used to confer knowledge on international development cooperation in a creative and practice-based manner.
The final users of the game will be university students from all academic institutions involved i.e. University of Szeged, STUCOM and iaelyon.

In the game students will have the opportunity to choose from 5 different roles (NGO from central Europe, a Central Europe, a Migration Office in Spain, a Chinese donor, African subsidiary of a European medium-sized corporation). During the game, students need to make decisions on different situations. Their decisions will have economic, social and environmental consequence. that are indicated on scales from 0-100. Students start from 50. These three indicators will either increase or decrease according to the decisions students will make.

In order to support the integration of classrooms, a guidebook is created with target groups, supporting questions, additional literature, and pedagogical methods.

The freely available game can be accessed here.

Behind the scene : download our own guidebook for the game we created